



**UNIVERSITY OF SPLIT**

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Faculty of Chemistry and Technology

**DETAILED PROPOSAL OF THE STUDY  
PROGRAMME**

**GRADUATE STUDY OF FOOD TECHNOLOGY**

SPLIT, May 2017.

## GENERAL INFORMATION OF HIGHER EDUCATION INSTITUTION

|                                      |                                                                   |
|--------------------------------------|-------------------------------------------------------------------|
| Name of higher education institution | University of Split Faculty of Chemistry and Technology           |
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## GENERAL INFORMATION OF THE STUDY PROGRAMME

|                                                         |                                                         |                                                  |                                                                |
|---------------------------------------------------------|---------------------------------------------------------|--------------------------------------------------|----------------------------------------------------------------|
| Name of the study programme                             | Graduate Study of Food Technology                       |                                                  |                                                                |
| Provider of the study programme                         | University of Split Faculty of Chemistry and Technology |                                                  |                                                                |
| Other participants                                      | -                                                       |                                                  |                                                                |
| Type of study programme                                 | Vocational study programme <input type="checkbox"/>     |                                                  | University study programme <input checked="" type="checkbox"/> |
| Level of study programme                                | Undergraduate <input type="checkbox"/>                  | Graduate <input checked="" type="checkbox"/>     | Integrated <input type="checkbox"/>                            |
|                                                         | Postgraduate <input type="checkbox"/>                   | Postgraduate specialist <input type="checkbox"/> | Graduate specialist <input type="checkbox"/>                   |
| Academic/vocational title earned at completion of study | Master Engineer of Food Technology                      |                                                  |                                                                |

# 1. INTRODUCTION

## 1.1. Resons for starting the proposed study programme

Food production and health benefits of food on human health are essential points in the development strategy of Republic Croatia (Croatian smart specialisation strategy 2016-2020). According to the available data from 2002 to 2012, the share food products in total exports of Republic Croatia was 9.6%, with annual growth of 9.8%. Since Croatia joined European Union (EU), the food production became more export-oriented sector what in last tree years resulted with higher growth rates in export, and reduced in import.

Faculty of Chemistry and Technology, as higher education and scientific institution, has activities in area of food science and food processing for a long time. In 1979, at Faculty of Chemistry and Technology the professional study of chemical engineering with food-engineering orientation was organized and performed, and since 2001/2002 the Faculty educate engineers of chemical technology trough the orientation course of Food Technology. This course was discontinued in 2016 when a new undergraduate study of Food Technology started. At graduate level, since 2001 at Faculty of Chemistry and Technology, an orientation of Mediteanean cultures is performed.

Graduate study of Food Technology on Faculty of Chemistry and Technology would give a strong impulse to the development of agricultural and food sector in Dalmatia and in other regional areas. This study ensure the knowledge on food and raw-material quality, their processing methods and their influence on human health with main goals on prevention chronic diseases (one of the major points of European Union's Research and Innovation funding program). In the proposal of this study, special focus was devoted to the varieties that are characteristic for Dalmatia region which has been recognised for its biodiversity- olives, seafood products (white and blue fish, shellfish, algae), grapes, honey, medicinal and aromatic herbs which are generally the ground of Mediterranean diet. As the answer to the unemployment problem, that is significant in Split-Dalmatia County, graduate study of Food Technology gives to the student necessary knowledge which could be helpful for them to start their own production; while in cooperation with tourist sector they could offer their products to the tourists who visit Croatia. Furthermore, the aim of this study is to induce the development of new companies based on the commercialisation of the results from different scientific investigation, as well as application of novel technologies and present practice at Faculty of Chemistry and Technology and University of Split.

## 1.2. Relationship with the local community (economy, entrepreneurship, civil society, etc.)

The proposed study program is based on the scientific knowledge from area of food technology, nutrition, chemistry, biology, biochemistry and microbiology and it enables wide base of skills that result in getting competences for solving complex practical and theoretic problems. Today, education of experts who will be able to

connect the knowledge and apply the obtained skills is one of the main challenges currently facing educational system.

Split-Dalmatia County is active regarding stimulation and financing scientific and professional projects, and readily develops cooperation with Faculties and Departments of University of Split, what resulted with financing a scientific project on olive oils that is at this moment active at Faculty of Chemistry and Technology. Beside with Split-Dalmatia County, Faculty of Chemistry and Technology cooperates with Public Health Institute of Split-Dalmatia County which accepts our students for professional practice or by other collaboration segments. Cooperative Association of Dalmatia organise different seminars on olive growth or processing and winemaking, and gather wine and olive oil producers that also support the graduate study of Food technology. Trough this study they recognise the global interest for the community of olive and olive oil producers, especially at this moment when the huge problem regarding the protection of authentic food products has arise. With the Association of olive growers and olive oil producers from Vela Luka, employees of the Department of Food Technology and Biotechnology at Faculty of Chemistry and Technology and Biotechnology participate in the EU founded project Interreg Med. The scientific area of the project is olive oil quality, and Dubrovnik-Neretva County also participate the project. Furthermore, a great number of small and middle companies like Trenton d.o.o., Uje d.o.o., Sardina d.o.o., Herba Croatica d.o.o. employ students who graduated at Faculty of Chemistry and Technology and cooperate with the Faculty trough the professional practice or some other segments of scientific research. Due to their geographic location near to Split-Dalmatia County, production facilities in Herzegovina, like Puđa d.o.o. cheese-making facility and Ledo d.o.o. ice-cream production company also cooperate with Faculty of Chemistry and Technology. As a part of education process, students visit their production facilities every year and see the production and organisation in these companies, the pallete of food products they produce and also they get the information about market demands that are more rigorous every year what is usually the main problem of food technologists.

Faculty of Chemistry and Technology also have collaboration with Split-Healthy City Association by organising presentations of the various books, and also students are included in their projects.

### **1.3. Compatibility with requirements of the professional organizations**

One of the major premises for the qualitative realisation of the proposed study programme is educational, professional and scientific connection of all relevant factors that can affect the process of student's education and training. Teachers who will perform the instructions on graduate study of Food Technology are members of different associations and societies (Croatian Society of Food Technologists, Biotechnologists and Nutritionists, Croatian Society for Clinical Nutrition, Croatian Association of Nutritionists, Croatian Chemical Society). Nowadays, when there is a great threat from so called pseudoscience, it is very important that higher educational institutions base their educational, science and professional activities on the demands of vocational associations, taking care on the protection of the profession basic and ethical principles which are necessary in all segments of public activities.

#### **1.4. Partners outside higher education system**

The partners outside higher educational system who support the graduate study of Food technology are numerous, different small and medium companies which are already mentioned, Split-Dalmatia County and Public Health Institute of Split-Dalmatia County, etc. Private companies like Herba Croatica and its sister company Stella Mediteranea infrequently have projects financed by EU funds and therefore are able to employ students from Faculty of Chemistry and Technology. Faculty partners are also institutes as follows: Institute Ruđer Bošković in Zagreb, Institute for Adriatic Crops and Karst Reclamation in Split, Institute of Oceanography and Fisheries in Split, Institute of Agriculture and Tourism in Poreč, Mediterranean Institute for Life Sciences- MedILs, and the cooperation agreement between some of these institutions and University of Split have been already signed.

#### **1.5. Mode of financing**

The planned source of financing for the graduate study of Food technology, as well as other study programs at Faculty of Chemistry and Technology, is the Ministry of Science, Education and Sports.

#### **1.6. Comparability of the study programme with other accredited programmes in higher education institutions from Croatia and EU**

During the elaboration of this study program special care was taken to harmonize the subjects and their teaching programs with related studies at other higher education institutions. In that way the programmes are mutually comparable and student and teacher mobility is stimulated.

The proposed program can be compared with the programmes of the following higher education institutions:

Technologie und Biotechnologie der Lebensmittel, Technische Universität München (TUM), [https://portal.mytum.de/studium/studiengaenge/technologie\\_und\\_biotechnologie\\_der\\_lebensmittel\\_master](https://portal.mytum.de/studium/studiengaenge/technologie_und_biotechnologie_der_lebensmittel_master)

Faculty of Engineering, Lund University (Programme in Food Technology and Nutrition), <http://www.lunduniversity.lu.se/lubas/i-uoh-lu-TALIV>

#### **1.1. Openness of the study towards students' mobility (horizontal, vertical in Croatia and abroad)**

The study is organised through the one-semester courses what is one of the basic preconditions for student mobility. The proposed program of the graduate study and its similarity with analogous studies in Croatia and EU allows students' and teachers' mobility. The mobility could be realised by choosing the particular courses from other University studies, as well as whole semester from other related studies or even through the work on the student diploma thesis. The mobility could be easily realised with other Departments and Faculties of University of Split as well as with other Universities in Croatia (Faculty of Food Technology and Biotechnology from University of Zagreb, Faculty of Food Technology from Josip Juraj Strossmayer University of Osijek), or other institutions in EU.

Faculty signed inter-institutional agreements for student`s and teacher`s mobility with institutions: Technische Universite Dresden, Dresden, Germany, Università degli studi di Cagliari, Cagliari, Italy, Università di Trieste, Trieste, Italy, AGH University of Science and Technology, Krakow, Poland, Polytechnic Institute of Braganca, Braganca, Portugal, University of Ljubljana, Ljubljana, Slovenia; University of Maribor, Maribor, Slovenia, Polymer Technology College, Maribor, Slovenia, etc. Faculty of Chemistry and Technology in Split also participate in multilateral cooperation with possibility of student`s and teacher`s mobility through Central European Exchange Program for University Studies (CEEPUS). The mentioned exchange program provided cooperation with different international institutions like: 1) Faculty of Material Science and Ceramics, AGH University of Science and Technology, Kraków, Poland, 2) Institute für Analytische Chemie, Karl-Franzens-Universität, Graz, Austria, 3) Department of Analytical Chemistry, Slovak University of Technology, Bratislava, Slovakia, 4) Institute of Analytical Chemistry, Faculty of Chemical Technology, University of Pardubice, Czech Republic, 5) Faculty of Chemistry and Chemical Engineering, University of Maribor, Slovenia, 6) Faculty of Pharmacy, Antioxidant Research Group, University of Barcelona, Spain, 7) Biotechnical Faculty, University of Ljubljana, Slovenia.

#### **1.8. Compatibility of the study programme with the strategy and mission of the University and proposer**

The study program has been compatible with the Development strategy of Faculty of Chemistry and Technology University of Split (2014-2020), and its mission and vision, as well with the University of Split Strategy (2015-2020).

#### **1.9. Former experiences in equivalent and similar study programmes**

Faculty of Chemical Technology of Split was founded in 1960, responding the economic demands of the region with aim to satisfy its personnel and professional needs. Since 2001/2002 at graduate level there was an orientation Mediterranean cultures (Graduate study of Chemical technology), and since 2015/2016 instead of professional study of Chemical technology, orientation Food technology, started the new undergraduate study of Food technology. On the grounds of the acquired scientific knowledge and economic demands, the teaching programs have been continuously improved and up-dated. Close cooperation between the region economy and the Faculty resulted with great number of projects, expertises, elaborates and finally in opening new orientations of pregraduate study, which are direct results of the region needs.

## 2. DESCRIPTION OF THE STUDY PROGRAMME

### 2.1. General information

|                                                             |                                                                                           |
|-------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| Scientific/artistic area of the study programme             | Biotechnical Sciences, Field: Food Technology                                             |
| Duration of the study programme                             | 2 years (4 semesters)                                                                     |
| The minimum number of ECTS required for completion of study | 120                                                                                       |
| Enrolment requirements and admission procedure              | Completed undergraduate study of Food Technology or other appropriate undergraduate study |

### 2.2. Learning outcomes of the study programme (15-30 learning outcomes)

After finishing graduate study of Food Technology master will:

- know the properties of raw materials and hazards that follow all processing steps from raw material acceptance to distribution of final product
  - recognize environment hazards for contaminant growth in particular food product and know to apply methods of early hazard detection as well as methods for its prevention
  - be familiar with all aspects of the particular production process and be able to apply a scientific approach in the prevention and resolution of problems that appear during the production process
  - be able to independently plan and carry out theoretical and experimental research
  - be able to critically evaluate the obtained data and use them to make appropriate conclusions
  - recognize the need for information, and also know how to find and provide them
  - know how to think logically and be able to recognize the incorrect information
  - be able to act as a team member in different disciplines and at different levels
  - be able to work and communicate effectively at national and international level
- Specific outcomes are:
- knowledge on the basic processes in the food industry
  - knowledge on novel technologies in food processing and benefits of their application
  - distinguish the advantages and disadvantages of the specific technologies which are important for the decision on the optimal processing technology for the certain raw material
  - knowledge on the mechanism that food component affect the human body
  - knowledge on impact of the environmental factors, processing methods and organism gastrointestinal conditions on the stability and bioavailability of nutritive and non-nutritive food components

- methodically connect the knowledge obtained from different areas such as chemistry, food, food safety, food engineering, microbiology and biochemistry and make the appropriate conclusions
- apply engineering skills in the processing management and solve the problems during the production of foods characteristic for the Mediterranean region.

### **2.3. Employment possibilities**

Graduates can be employed by the aforementioned business entities which have cooperation with the Faculty, as well as in different educational institutions, inspection services at the national and regional level, etc.

The employment opportunities in the region:

- Uje d.o.o., Split
- Sardina d.o.o., otok Brač (Postira)
- Trenton d.o.o., Muć
- Herba Croatica d.o.o., Klis
- Stella Mediteranea d.o.o., Klis
- Vinarija Grabovac, Imotski
- Ledo, Čitluk (BiH)
- Puđa d.o.o., Livno (BiH), Čaprice (Hrvatska)
- Mils d.o.o., Split
- Bobis d.o.o., Split
- Pekara Babić d.o.o., Split
- Mesna industrija Braća Pivac, Vrgorac
- Petason d.o.o., Solin
- Sirana Gligora d.o.o., Otok Pag
- Pramenka- Lećevečka mljekara d.o.o., Lećeveica
- Felicita d.o.o., Konjsko
- Canicula d.o.o., Muć
- Marikomerc d.o.o., Poličnik
- Dalmacijavino d.o.o., Split

### **2.4. Possibilities of continued education at higher academic level**

Students who finish the graduate study of Food technology could continue their education at other higher education institutions in Republic Croatia (Faculty of Food Technology and Biotechnology in Zagreb, and Faculty of Food Technology at the Josip Juraj Strossmayer University in Osijek), as well abroad, especially in area of European higher education system.

### **2.5. Academic level studies of the proposer or other institutions that qualify for admission to the proposed study**

The enrollment to graduate study of Food Technology is open for the candidates that completed the appropriate undergraduate study (180 ECTS credits). The appropriate undergraduate studies are those from the biotechnical sciences (food technology, biotechnology and nutrition), from the technical sciences (chemical engineering) and from the natural sciences (chemistry), as well from the related



studies with eventual obligation to take additional exams. The final decision on students obligations and exams that should be attended will be established by Faculty of Chemistry and Technology Council.

## **2.6. Study modes and terms**

Modes and terms of the graduate study of Food Technology are based on Ordinance on study programmes and course attendance system of Faculty of Chemistry and Technology in Split which is in compliance with the Ordinance on study programmes and course attendance system of University of Split. The mentioned ordinance interprets in detail the conditions of enrolment the higher study year, regular and exceptional exam terms, exam dates, etc.

The duration of graduate study of Food Technology is two years; it includes mandatory and elective courses, and it is based on active participation of students in all forms of studying (lectures, laboratory exercises, seminars, field work, etc.). In general, students' obligations include presence at lectures and exercises, independent learning, scientific literature search and analysis, presentations, field work and the preparation of the final diploma thesis; while teachers monitor and evaluate all activities in particular study course.

The programme is composed in way that students have a large number of elective courses. The accent is based on the area that discuss food safety problems, sensory evaluation of foods, and technologies that are used for processing raw materials that are characteristic for Dalmatia region (olives, grapes, seafood, herbs and spices).

## **2.7. Guiding and tutoring through the study system**

At Faculty of Chemistry and Technology there is a teacher-supervisor model with the aim of providing advices, information and guidance to students. Also mentors help and participate the research work in order to ensure the quality of diploma thesis.

## **2.8. List of courses that students can select from other study programmes**

Students of Graduate study of Food technology can chose some subjects from other studies at other Departments and Faculties of University of Split (like English, Physical Education and Health Science, etc.) which could be potentially be part of the student responsibilities.

## **2.9. List of courses provided in a foreign languages**

Course lectures of the graduate study programme of Food technology will be provided in Croatian, but if is necessary some courses can be realised in English for foreign students.

## **2.10. Criteria and requirements for ECTS credits transfer**

The criteria and requirements for the ECTS credits transfer are defined by the Regulation on study programmes and course attendance system of University of Split,

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by the Faculty of Chemistry and Technology Statute and its Regulation on study programmes and course attendance system.

## 2.11. List of mandatory and elective courses

| List of courses                |        |                             |                   |     |    |    |      |
|--------------------------------|--------|-----------------------------|-------------------|-----|----|----|------|
| Year of study: 1 <sup>st</sup> |        |                             |                   |     |    |    |      |
| Semester: 1 <sup>st</sup>      |        |                             |                   |     |    |    |      |
| STATUS                         | CODE   | COURSE                      | HOURS IN SEMESTER |     |    |    | ECTS |
|                                |        |                             | L                 | S   | E  | F  |      |
| Mandatory                      | KTM100 | Applied Mathematics         | 30                | 15  | 0  | 0  | 4.0  |
|                                | KTM101 | Physical Properties of Food | 30                | 0   | 15 | 0  | 4.0  |
|                                | KTM102 | Food Safety                 | 30                | 0   | 15 | 0  | 5.0  |
|                                | KTM103 | Wine technology             | 30                | 0   | 15 | 15 | 6.0  |
|                                | KTM104 | Biochemical Engineering     | 30                | 15  | 15 | 0  | 6.0  |
|                                | KTM105 | Mediterranean Diet          | 30                | 15  | 0  | 0  | 4.0  |
|                                | Total  |                             | 150               | 180 | 45 | 60 | 29.0 |

| List of courses                |        |                                           |                   |    |    |    |      |
|--------------------------------|--------|-------------------------------------------|-------------------|----|----|----|------|
| Year of study: 1 <sup>st</sup> |        |                                           |                   |    |    |    |      |
| Semester: 2 <sup>nd</sup>      |        |                                           |                   |    |    |    |      |
| STATUS                         | CODE   | COURSE                                    | HOURS IN SEMESTER |    |    |    | ECTS |
|                                |        |                                           | L                 | S  | E  | F  |      |
| Mandatory                      | KTM106 | Sustainable Technologies in Food Industry | 30                | 15 | 0  | 0  | 5.0  |
|                                | KTM107 | Process Design                            | 30                | 30 | 0  | 0  | 7.0  |
|                                | KTM108 | Honey and Other Bee Products              | 30                | 0  | 15 | 0  | 4.0  |
|                                | KTM109 | Novel Food Processing Technologies        | 30                | 0  | 10 | 5  | 5.0  |
|                                | KTM110 | Fermented Dairy Products and Cheesemaking | 30                | 15 | 20 | 10 | 7.0  |
|                                |        | Professional Practice                     |                   |    |    |    | 3.0  |
|                                | Total  |                                           | 150               | 60 | 45 | 15 | 31.0 |

| List of courses                                                                                                                                                                                                                                                                                                       |        |                                            |                   |    |    |    |      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------------------------------------------|-------------------|----|----|----|------|
| Year of study: 2 <sup>nd</sup>                                                                                                                                                                                                                                                                                        |        |                                            |                   |    |    |    |      |
| Semester: 3 <sup>rd</sup>                                                                                                                                                                                                                                                                                             |        |                                            |                   |    |    |    |      |
| STATUS                                                                                                                                                                                                                                                                                                                | CODE   | COURSE                                     | HOURS IN SEMESTER |    |    |    | ECTS |
|                                                                                                                                                                                                                                                                                                                       |        |                                            | L                 | S  | E  | F  |      |
| Elective                                                                                                                                                                                                                                                                                                              | KTM200 | Olive Processing Technologies*             | 30                | 15 | 20 | 10 | 6.0  |
|                                                                                                                                                                                                                                                                                                                       | KTM201 | Fruit and Vegetable Processing*            | 30                | 15 | 25 | 5  | 6.0  |
|                                                                                                                                                                                                                                                                                                                       | KTM202 | Seafood Processing Technology*             | 30                | 15 | 20 | 10 | 6.0  |
|                                                                                                                                                                                                                                                                                                                       | KTM203 | Processing Technology of Herbs and Spices* | 30                | 15 | 30 | 0  | 6.0  |
|                                                                                                                                                                                                                                                                                                                       | KTM204 | Alcoholic Beverages Technology             | 30                | 0  | 15 | 15 | 6.0  |
|                                                                                                                                                                                                                                                                                                                       | KTM205 | Technology of Meat and Meat Products       | 30                | 15 | 30 | 0  | 6.0  |
|                                                                                                                                                                                                                                                                                                                       | KTM206 | Technology of Cereals                      | 30                | 0  | 15 | 15 | 6.0  |
|                                                                                                                                                                                                                                                                                                                       | KTM207 | Corrosion and Materials Protection         | 30                | 0  | 30 | 0  | 5.0  |
|                                                                                                                                                                                                                                                                                                                       | KTM208 | Algae Biotechnology                        | 30                | 0  | 15 | 0  | 4.0  |
|                                                                                                                                                                                                                                                                                                                       | KTM209 | Food Biotransformations                    | 30                | 0  | 15 | 0  | 4.0  |
|                                                                                                                                                                                                                                                                                                                       | KTM210 | Functional Foods and Nutraceuticals        | 30                | 0  | 15 | 0  | 4.0  |
|                                                                                                                                                                                                                                                                                                                       | KTM211 | Ethnobotany                                | 15                | 15 | 0  | 15 | 4.0  |
|                                                                                                                                                                                                                                                                                                                       | KTM212 | Novel Fruit and Vegetable Products         | 30                | 15 | 0  | 0  | 4.0  |
|                                                                                                                                                                                                                                                                                                                       | KTM213 | Flavour Chemistry                          | 30                | 0  | 15 | 0  | 4.0  |
|                                                                                                                                                                                                                                                                                                                       | KTM214 | Citrus Processing**                        | 30                | 0  | 15 | 0  | 4.0  |
| The minimum amount of credits that must be obtained from elective courses is 30.<br>*The course could be chosen only if student did not select it at undergraduted study of Food Technology<br>** The course Citrus processing can be chosen only if student did not select the course Fruit and vegetable processing |        |                                            |                   |    |    |    |      |

| List of courses                |        |                                     |                   |    |    |   |      |
|--------------------------------|--------|-------------------------------------|-------------------|----|----|---|------|
| Year of study: 2 <sup>nd</sup> |        |                                     |                   |    |    |   |      |
| Semester: 4 <sup>th</sup>      |        |                                     |                   |    |    |   |      |
| STATUS                         | CODE   | COURSE                              | HOURS IN SEMESTER |    |    |   | ECTS |
|                                |        |                                     | L                 | S  | E  | F |      |
| Mandatory                      | KTM215 | Introduction to Scientific Research | 15                | 15 | 0  | 0 | 2.0  |
|                                | KTM216 | Sensory Evaluation of Food          | 20                | 15 | 10 | 0 | 4.0  |
|                                |        | Diploma Thesis                      |                   |    |    |   | 18.0 |
|                                | Total  |                                     | 35                | 30 | 10 | 0 | 24.0 |
| Elective                       | KTM217 | Novel Food Packaging Techniques     | 30                | 15 | 0  | 0 | 4.0  |

The minimum amount of credits that must be obtained from elective courses is 6.0.

## Applied Mathematics

| NAME OF THE COURSE                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Applied Mathematics                      |     |    |   |   |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-----|----|---|---|
| Code                                                                              | KTM100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Year of study                            | 1st |    |   |   |
| Course teacher                                                                    | Nives Baranović, Lecturer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Credits (ECTS)                           | 4.0 |    |   |   |
| Associate teachers                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Type of instruction<br>(number of hours) | L   | S  | E | F |
|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                          | 30  | 15 | 0 | 0 |
| Status of the course                                                              | Mandatory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Percentage of application of e-learning  | 20% |    |   |   |
| COURSE DESCRIPTION                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                          |     |    |   |   |
| Course objectives                                                                 | <p>Student are introduced to the ideas and methods of approximate solving algebraic and differential equations, interpolation and numerical integration, to concepts of the theory of probability and statistics and their application to particular example and tasks.</p> <p>By developing a positive attitude toward learning, responsibility for own success and progress, and the acquisition of competencies described above, the students are expected to build a solid foundation for lifelong learning and further education.</p>                                                                                                                                                                                                                                                                                                                                                |                                          |     |    |   |   |
| Course enrolment requirements and entry competences required for the course       | Students should have fundamental competencies related to the calculus.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                          |     |    |   |   |
| Learning outcomes expected at the level of the course (4 to 10 learning outcomes) | <p>After the passing the exam, students will be able to:</p> <ul style="list-style-type: none"> <li>- use appropriate language, symbolic notation and graphic representation to describe the ideas and methods for numerical solving equations;</li> <li>- apply the methods described above in the particular tasks;</li> <li>- describe the concept and define the notions of probability theory;</li> <li>- understand the concepts and apply the methods described above in real situations;</li> <li>- define discrete and continuous random variables and their characteristics;</li> <li>- properly interpret characteristics of random variables on particular examples;</li> <li>- describe examples of important distribution and identify conditions for their use in problem solving;</li> <li>- describe the concept and define the notions of statistics theory;</li> </ul> |                                          |     |    |   |   |

|                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |               |                                                                                                                                                                                                                            |                              |     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-----|
|                                                                                                                                                                           | <ul style="list-style-type: none"><li>- use a computer and appropriate software as a tool in the statistical data processing;</li><li>- understand the process of statistical testing and parametric and non-parametric sample testing.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |               |                                                                                                                                                                                                                            |                              |     |
| Course content broken down in detail by weekly class schedule (syllabus)                                                                                                  | <p>1st week: Introduction to the objectives and learning outcomes, curriculum, methods of evaluation and assessment criteria.</p> <p>2nd week: Errors of approximate values. The types of errors. Sources of errors.</p> <p>3rd week: Solving equations approximately. Graphical method. Bisection method. Iteration. Secant method. Tangent method.</p> <p>4th week: Interpolation and approximation.</p> <p>5th week: Numerical integration. Rectangular formula. Trapezium formula. Simpson's formula.</p> <p>6th week: Numerical solving of differential equations. Euler's method. Taylor's method.</p> <p>Written exam.</p> <p>7th week: Definition and properties of probability.</p> <p>8th week: Conditional probability. Independence of events.</p> <p>9th week: Random variables. Discrete and continuous random variables.</p> <p>10th week: Independence of random variables.</p> <p>11th week: Numerical characteristics of random variables. Mathematical expectation.</p> <p>12th week: Dispersion. Mode and median. Moments. The coefficient of skewness and kurtosis.</p> <p>13th week: Some important distributions. Binomial distribution. Poisson distribution. Normal distribution. Uniform distribution. Exponential distributions.</p> <p>14th week: Basics of statistics. Population. Sample. Displaying data. The average value of the sample. Sample variance. Sample mode. Sample median.</p> <p>15th week: Statistical testing. Parametric test. Nonparametric test. X<sup>2</sup> test.</p> <p>Written exam.</p> |     |               |                                                                                                                                                                                                                            |                              |     |
| Format of instruction                                                                                                                                                     | <input checked="" type="checkbox"/> lectures<br><input type="checkbox"/> seminars and workshops<br><input checked="" type="checkbox"/> exercises<br><input type="checkbox"/> <i>on line</i> in entirety<br><input type="checkbox"/> partial e-learning<br><input type="checkbox"/> field work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |               | <input checked="" type="checkbox"/> independent assignments<br><input type="checkbox"/> multimedia<br><input type="checkbox"/> laboratory<br><input type="checkbox"/> work with mentor<br><input type="checkbox"/> (other) |                              |     |
| Student responsibilities                                                                                                                                                  | Regular attendance class, take part in discussions and solving problems.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |               |                                                                                                                                                                                                                            |                              |     |
| Screening student work ( <i>name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course</i> ) | Class attendance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |     | Research      |                                                                                                                                                                                                                            | Practical training           |     |
|                                                                                                                                                                           | Experimental work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     | Report        |                                                                                                                                                                                                                            | (Other)                      | 0.8 |
|                                                                                                                                                                           | Essay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     | Seminar essay |                                                                                                                                                                                                                            | (Other)                      |     |
|                                                                                                                                                                           | Tests                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     | Oral exam     | 1.6                                                                                                                                                                                                                        | (Other)                      |     |
|                                                                                                                                                                           | Written exam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1.6 | Project       |                                                                                                                                                                                                                            | (Other)                      |     |
| Grading and evaluating student work in class and at the final exam                                                                                                        | <p>The first method: Engagement during semester 20% (E), written exam 40% (W) and oral exam 40% (O). During the semester, student can do additional task, write a seminar paper and express own knowledge through activities in class. The final score: <math>z = 0.2(E) + 0.4(W) + 0.4(O)</math>.</p> <p>The second method: written exam 500% and oral exam 50%; final: <math>z = 0.5(W) + 0.5(O)</math>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |               |                                                                                                                                                                                                                            |                              |     |
| Required literature (available in the library and via other                                                                                                               | Title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |               | Number of copies in the library                                                                                                                                                                                            | Availability via other media |     |

|                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |            |
|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------|
| media)                                                                      | N. Baranović: Primijenjena matematika, materijal dostupan na moodlu Filozofskog fakulteta, 2014. <a href="https://paideia.ffst.hr/learning/login/index.php">https://paideia.ffst.hr/learning/login/index.php</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  | E-learning |
| Optional literature (at the time of submission of study programme proposal) | I. Ivanšić: Numerička matematika, Element, Zagreb, 2002.<br>R. Scitovski: Numerička matematika <a href="http://www.mathos.unios.hr/nm/materijali/Num.pdf">http://www.mathos.unios.hr/nm/materijali/Num.pdf</a> , 2004.<br>N. Elezović: Diskretna vjerojatnost, Element, Zagreb, 2008<br>N. Elezović: Matematička statistika. Statistički procesi, Element, Zagreb, 2008<br>E. Kreyszig: Advanced Engineering Mathematics, J. Wiley & Sons, New York, 1999. ( <a href="http://faculties.sbu.ac.ir/~sadough/pdf/Advanced%20Engineering%20Mathematics%2010th%20Edition.pdf">http://faculties.sbu.ac.ir/~sadough/pdf/Advanced%20Engineering%20Mathematics%2010th%20Edition.pdf</a> ) |  |            |
| Quality assurance methods that ensure the acquisition of exit competences   | Quality assurance will be performed at three levels: (1) University Level; (2) Faculty Level by Quality Control Committee; (3) Lecturer's Level.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |            |
| Other (as the proposer wishes to add)                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |            |

## Physical Properties of Food

| NAME OF THE COURSE                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Physical Properties of Food                |     |   |    |   |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-----|---|----|---|
| Code                                                                              | KTM101                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Year of study                              | 1st |   |    |   |
| Course teacher                                                                    | Ph. D. Vesna Sokol,<br>Associate Professor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Credits (ECTS)                             | 4.0 |   |    |   |
| Associate teachers                                                                | Ph. D. Perica Bošković                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Type of instruction<br>(number of hours)   | L   | S | E  | F |
|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                            | 30  | 0 | 15 | 0 |
| Status of the course                                                              | Mandatory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Percentage of<br>application of e-learning |     |   |    |   |
| COURSE DESCRIPTION                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                            |     |   |    |   |
| Course objectives                                                                 | Introduce students to the physical properties of food products as well as the changes of physical properties of food which occur during food processing.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                            |     |   |    |   |
| Course enrolment requirements and entry competences required for the course       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                            |     |   |    |   |
| Learning outcomes expected at the level of the course (4 to 10 learning outcomes) | After successfully passing the course, students will be able to:<br>- define and describe the physical properties of food (rheological properties, thermophysical properties, diffusion, dielectric properties ...)<br>- explain the physical phenomena that occur in the operations and processes in the food industry,<br>- describe the basic principles and possibilities of application of different methods (spectroscopy, viscometry, DLS, SLS, TEM, SANS) for exploring the structure and composition of food products and thermophysical properties (DTA, DSC),<br>- to plan the laboratory procedures and independently to conduct an experiment in accordance with the plan of research,<br>- to implement appropriate computer programs for numerical processing of |                                            |     |   |    |   |

|                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |               |                                 |                              |  |
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|                                                                                                                                                                | experimental data and graphic representation of the results obtained; discuss the results and reach a conclusion at the end.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |               |                                 |                              |  |
| Course content broken down in detail by weekly class schedule (syllabus)                                                                                       | 1st week: Introduction. Introduction to operations and processes in the food industry.<br>2nd week: Rheological properties of food. Elasticity, plasticity, viscosity.<br>3rd week: The viscosity of non-Newtonian fluid. Rheological properties of dough.<br>4th week: Experimental techniques of measuring viscosity. Transport of Newtonian and non-Newtonian fluids.<br>5th week: Rheological properties of granular and powdered foods. Rheological properties of the suspension.<br>6th week: Application of experimental techniques to study the structure and composition of food products (spectroscopy, DLS, SLS, TEM, SANS).<br>7th week: Transport of granular and powdered foods and suspension. Textural properties.<br>8th week: Thermophysical properties. The phase transition temperatures. Freezing temperature. Defrost temperature. The phase transitions at low temperatures.<br>9th week: The application of experimental techniques in the study of thermophysical properties (DTA, DSC).<br>10th week: Definitions and determination of the specific heat, latent heat, enthalpy, density, thermal conductivity and diffusion.<br>11th week: The water in the food. Water activity. Absolute and relative humidity. Sorption isotherms.<br>12th week: Interface phenomena: liquid-gas, liquid-liquid, solid-liquid, solid-gas.<br>13th week: Emulsions. Emulsifiers. Aggregation. Sedimentation. Coalescence.<br>14th week: Foams. Mechanical equilibrium and structure of the foams. Optical properties. The influence of different parameters on the stability of the foams.<br>15th week: Dielectric properties of food. Diffusion and mass transfer.<br>Laboratory exercises:<br>1) The density and bulk density, 2) Refractometry, 3) Surface tension, 4) Adsorption |     |               |                                 |                              |  |
| Format of instruction                                                                                                                                          | <div><div><input checked="" type="checkbox"/> lectures<br/><input type="checkbox"/> seminars and workshops<br/><input checked="" type="checkbox"/> exercises<br/><input type="checkbox"/> <i>on line</i> entirety<br/><input type="checkbox"/> partial e-learning<br/><input type="checkbox"/> field work</div><div><input checked="" type="checkbox"/> independent assignments<br/><input checked="" type="checkbox"/> multimedia<br/><input checked="" type="checkbox"/> laboratory<br/><input type="checkbox"/> work with mentor<br/><input type="checkbox"/> (other)</div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |               |                                 |                              |  |
| Student responsibilities                                                                                                                                       | Students are required to attend classes and actively participate in the teaching process. This will be recorded and evaluated in making a final assessment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |               |                                 |                              |  |
| Screening student work(name the proportion of ECTS credits for eachactivity so that the total number of ECTS credits is equal to the ECTS value of the course) | Class attendance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     | Research      |                                 | Practical training           |  |
|                                                                                                                                                                | Experimental work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1.0 | Report        |                                 | (Other)                      |  |
|                                                                                                                                                                | Essay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |     | Seminar essay | 1.0                             | (Other)                      |  |
|                                                                                                                                                                | Tests                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |     | Oral exam     | 1.0                             | (Other)                      |  |
|                                                                                                                                                                | Written exam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 1.0 | Project       |                                 | (Other)                      |  |
| Grading and evaluating student work in class and at the final exam                                                                                             | The course content is divided into two units that students take over partial exams or joining final exam at the end of the semester. The exam is considered passed if students achieve at least 60%. The final grade is based on the evaluation of partial exams. Grades: <60% not satisfied; 60-69% successful (2) 70-79% good (3), 80-89% very good (4), 90-100% excellent (5).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |               |                                 |                              |  |
| Required literature (available in the library and via other media)                                                                                             | Title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |     |               | Number of copies in the library | Availability via other media |  |
|                                                                                                                                                                | John N. Coupland, An Introduction to the Physical                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |               | 1                               |                              |  |



|                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |  |
|-----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|--|
|                                                                             | Chemistry of Food, 2014, Springer New York                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |  |
|                                                                             | Ignacio Arana, Physical Properties of Foods: Novel Measurement Techniques and Applications, 2016, CRC Press                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 1 |  |
|                                                                             | P. Walstra: Physical Chemistry of Foods, Marcel Dekker, Inc., New York/Basel, 2003.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1 |  |
| Optional literature (at the time of submission of study programme proposal) | J. Sjoblom: Encyclopedic Handbook of Emulsion Technology, Emulsion Technology Handbook, C.H.I.P.S., USA, 2001.<br>A. Howard, A. Barnes: Handbook of Elementary Rheology, Cambrian Printers, UK, 2000.<br>B. A. Fricke, B. R. Becker: Evaluation of Thermophysical Property Models for Foods, Hvac and R Research 7 (2001) 311.<br>A. Sun, S. Gunasekaran: Measuring Rheological Characteristics and Spreadability of Soft Foods, Journal of Texture Studies 40 (2009) 275.<br>R. A. F. Cabral, C. E. Orrego-Alzate A. L. Gabas, J. Telis-Romero: Rheological and thermophysical properties of blackberry juice, Ciênc. Tecnol. Aliment., Campinas, 27 (2007) 589. |   |  |
| Quality assurance methods that ensure the acquisition of exit competences   | Quality assurance will be performed at three levels: (1) University Level; (2) Faculty Level by Quality Control Committee; (3) Lecturer's Level.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |   |  |
| Other (as the proposer wishes to add)                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |  |

## Food Safety

| NAME OF THE COURSE                                                          |                                                                                                                                                                                                                                                                                        | Food Safety                             |     |   |    |   |  |
|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|---|----|---|--|
| Code                                                                        | KTM102                                                                                                                                                                                                                                                                                 | Year of study                           | 1st |   |    |   |  |
| Course teacher                                                              | Ph. D. Tea Bilušić, Full Professor                                                                                                                                                                                                                                                     | Credits (ECTS)                          | 5.0 |   |    |   |  |
| Associate teachers                                                          |                                                                                                                                                                                                                                                                                        | Type of instruction (number of hours)   | L   | S | E  | F |  |
|                                                                             |                                                                                                                                                                                                                                                                                        |                                         | 30  | 0 | 15 | 0 |  |
| Status of the course                                                        | Mandatory                                                                                                                                                                                                                                                                              | Percentage of application of e-learning | 30% |   |    |   |  |
| COURSE DESCRIPTION                                                          |                                                                                                                                                                                                                                                                                        |                                         |     |   |    |   |  |
| Course objectives                                                           | Objectives of this course are to learn new knowledge in the field of food safety. It includes the knowledge on the food safety as the integral part of food chain management. Also, it includes the knowledge on the main food contaminants and method for their early identification. |                                         |     |   |    |   |  |
| Course enrolment requirements and entry competences required for the course |                                                                                                                                                                                                                                                                                        |                                         |     |   |    |   |  |
| Learning outcomes expected at the level of the course (4 to 10 learning     | Learning outcomes are the following:<br>- to know how to implement the concept of safe food (from the farm to the plate)<br>- to recognize main food environmental contaminants (microbiological, chemical and physical)                                                               |                                         |     |   |    |   |  |

|                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |     |               |                                                                                                                                                                                                                                       |                              |  |
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| outcomes)                                                                                                                                                        | - to accept the knowledge about food safety legislation<br>- to accept the knowledge on the main methods for the detection of food contaminants                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |     |               |                                                                                                                                                                                                                                       |                              |  |
| Course content broken down in detail by weekly class schedule (syllabus)                                                                                         | 1st week: Course introduction. Natural cell mechanisms and toxins metabolism.<br>2nd week: Biological risks (bacteria as food contaminants)<br>3th week: Biological risks (viruses, molds)<br>4th week: Chemical risks (additives, residues of pesticides)<br>5th week: Chemical risks (environmental toxins, microbial and processing food contaminants)<br>6th week: methods for identification of microbiological and chemical risks for food safety<br>7th week: Physical risks<br>8th week: Micotoxins<br>9th week: food traceability (the protection of food products, the protection of consumers)<br>10th week: the risks from animal-derived food<br>11th week. The mechanisms of the control of food safety<br>12th week: the questions of public health<br>13th week: the diet and its role in public health<br>14th week: food safety legislation<br>15th week: food licensing<br>Laboratory practices: - sampling and determination of main physico-chemical and microbiological risk: a) read meat and poultry samples; b) milk and dairy products, c) fish and sea products; d) honey, e) fruits and vegetables |     |               |                                                                                                                                                                                                                                       |                              |  |
| Format of instruction                                                                                                                                            | <input checked="" type="checkbox"/> lectures<br><input type="checkbox"/> seminars and workshops<br><input checked="" type="checkbox"/> exercises<br><input type="checkbox"/> <i>on line</i> in entirety<br><input type="checkbox"/> partial e-learning<br><input type="checkbox"/> field work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |               | <input type="checkbox"/> independent assignments<br><input checked="" type="checkbox"/> multimedia<br><input checked="" type="checkbox"/> laboratory<br><input type="checkbox"/> work with mentor<br><input type="checkbox"/> (other) |                              |  |
| Student responsibilities                                                                                                                                         | Active participation in lectures (70%) and in laboratory work (100%).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     |               |                                                                                                                                                                                                                                       |                              |  |
| Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course) | Class attendance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1.0 | Research      |                                                                                                                                                                                                                                       | Practical training           |  |
|                                                                                                                                                                  | Experimental work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1.0 | Report        |                                                                                                                                                                                                                                       | (Other)                      |  |
|                                                                                                                                                                  | Essay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     | Seminar essay |                                                                                                                                                                                                                                       | (Other)                      |  |
|                                                                                                                                                                  | Tests                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     | Oral exam     | 2.0                                                                                                                                                                                                                                   | (Other)                      |  |
|                                                                                                                                                                  | Written exam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1.0 | Project       |                                                                                                                                                                                                                                       | (Other)                      |  |
| Grading and evaluating student work in class and at the final exam                                                                                               | Final grade includes the success from partial written exams (2) and from the exam of the laboratory practices.<br>Grading: <60% not sufficient; 60-70% sufficient (2); 70-80% good (3); 80-90% very good (4); 90-100% excellent (5).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |               |                                                                                                                                                                                                                                       |                              |  |
| Required literature (available in the library and via other media)                                                                                               | Title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     |               | Number of copies in the library                                                                                                                                                                                                       | Availability via other media |  |
|                                                                                                                                                                  | J. Havranek, M. Tudor Kalit, R. Bažok, J. Đugum, D. Grbeša, M. Hadžiosmanović, A. Ivanković, I. Jakopović, S. Orešković, V. Rupić, D. Samaržija: Sigurnost hrane – od farme do stola, M.E.P., Zagreb, 2014.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |               | 1                                                                                                                                                                                                                                     |                              |  |
|                                                                                                                                                                  | I.Babić, J. Đugum: Uvod u sigurnost hrane, Institut za sanitarno inženjerstvo Slovenije, Ljubljana.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |               |                                                                                                                                                                                                                                       | 1                            |  |

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|                                                                             | Slovenija, 2014                                                                                                                                            |  |   |
|                                                                             | B. Šarkanj, D. Kipčič, Đ. Vasić-Rački, F. Delaš, K. Galić, M. Katalenić, N. Dimitrov, T. Klapac: Kemijske i fizikalne opasnosti u hrani, Osijek, HAH, 2010 |  | 1 |
| Optional literature (at the time of submission of study programme proposal) | I.C. Schaw: Food safety – the science of keeping food safe. Wiley Blackwell, UK, 2013.                                                                     |  |   |
| Quality assurance methods that ensure the acquisition of exit competences   | Quality assurance will be performed at three levels: (1) University Level; (2) Faculty Level by Quality Control Committee; (3) Lecturer's Level.           |  |   |
| Other (as the proposer wishes to add)                                       |                                                                                                                                                            |  |   |

## Wine Technology

| NAME OF THE COURSE                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Wine Technology                         |     |   |    |    |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|---|----|----|
| Code                                                                              | KTM103                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Year of study                           | 1st |   |    |    |
| Course teacher                                                                    | Ph. D. Irena Budić-Leto, Assistant Professor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Credits (ECTS)                          | 6.0 |   |    |    |
| Associate teachers                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Type of instruction (number of hours)   | L   | S | E  | F  |
|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                         | 30  | 0 | 15 | 15 |
| Status of the course                                                              | Mandatory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Percentage of application of e-learning |     |   |    |    |
| COURSE DESCRIPTION                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                         |     |   |    |    |
| Course objectives                                                                 | Enabling students for:<br>- Acquire fundamental knowledge of grape maturity and quality of grape, composition and quality of must and wine<br>- Acquire fundamental knowledge of technological processes and principles in production of different types of wines<br>- Acquire fundamental knowledge about the factors that affect the quality of wine<br>- Knowledge of chemical composition and sensory characteristics of wine                                                                                                                                                      |                                         |     |   |    |    |
| Course enrolment requirements and entry competences required for the course       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                         |     |   |    |    |
| Learning outcomes expected at the level of the course (4 to 10 learning outcomes) | Students after successfully learning course can:<br>- know the chemical composition of grapes and understand how grape maturity affects on wine quality<br>- explain alcoholic and malolactic fermentation<br>- know the role of biochemical and microbiological processes in the formation of wine quality<br>- explain the role of pre-fermentation and postfermentation processes and their impact on the quality of wine<br>- apply technological processes in the production of različitih vrsta vina<br>- apply basic physico-chemical methods in must and wine quality analysis |                                         |     |   |    |    |

|                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |               |                                                                                                                                                                                                                                                                                  |                              |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|--|
|                                                                                                                                                                           | <div>-know the processes of wine maturation and ageing</div> <div>- acquire fundamental knowledge of the sensory properties of wine</div> <div>-provide with information about low regulation and restrictions in wine production</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |               |                                                                                                                                                                                                                                                                                  |                              |  |
| Course content broken down in detail by weekly class schedule (syllabus)                                                                                                  | <div>1st week: Technological maturity of grapes for wine production. The effects of ecological factors on grape quality</div> <div>2nd week: Chemical composition of grape and must: sugar, organic acids, phenolic compounds, nitrogen compounds, minerals and other important compounds</div> <div>3th week: Harvesting and grape processing. Equipment. The role of sulfur dioxide in must and wine</div> <div>4th week: Adjustments to Must. Application of enological preparations. Starter yeast culture. Enzyme addition</div> <div>5th week: Predfermentative preparation of must. White wine technology</div> <div>6th week: Alcoholic fermentation: biochemistry and fermentation products. Conditions of Yeast Development. Malolactic fermentation. Lactic Acid Bacteria. Factors affecting alcoholic and malolactic Fermentation (1. partial exams)</div> <div>7th week: Technology of red and rosé wine. Factors affecting maceration. Fermentors</div> <div>8th week: Specifics in the production of special and sparkling wines. Production of Prošek</div> <div>9th week: Filtration of wine. Techniques of filtration. Centrifugation. Equipment</div> <div>10th week: Stabilizing wine by physical and physicochemical processes</div> <div>11th week: The basics of barrique technology</div> <div>12th week: Organoleptic defects of wine. The causes of development and prevention</div> <div>13th week: The chemical composition of the wine. The aroma of wine. The chemical-physical analysis methods</div> <div>14th week: Selected legal regulations and restrictions in winemaking</div> <div>15th week: Sensory evaluation of wine (2. partial exams)</div> <div>Field work: Dating processing unit processes the grape harvest from the alcoholic fermentation of must / mash; Introduction of technological equipment and process of wine-making</div> |     |               |                                                                                                                                                                                                                                                                                  |                              |  |
| Format of instruction                                                                                                                                                     | <div><input checked="" type="checkbox"/> lectures</div> <div><input checked="" type="checkbox"/> seminars and workshops</div> <div><input checked="" type="checkbox"/>exercises</div> <div><input type="checkbox"/> <i>on line</i> in entirety</div> <div><input type="checkbox"/> partial e-learning</div> <div><input checked="" type="checkbox"/> field work</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |               | <div><input type="checkbox"/> independent assignments</div> <div><input type="checkbox"/> multimedia</div> <div><input checked="" type="checkbox"/> laboratory</div> <div><input checked="" type="checkbox"/> work with mentor</div> <div><input type="checkbox"/> (other)</div> |                              |  |
| Student responsibilities                                                                                                                                                  | Active participation in all activities: lectures, consultations, searching the literature.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |               |                                                                                                                                                                                                                                                                                  |                              |  |
| Screening student work ( <i>name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course</i> ) | Class attendance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1.0 | Research      |                                                                                                                                                                                                                                                                                  | Practical training           |  |
|                                                                                                                                                                           | Experimental work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0.5 | Report        |                                                                                                                                                                                                                                                                                  | (Other)                      |  |
|                                                                                                                                                                           | Essay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     | Seminar essay | 0.5                                                                                                                                                                                                                                                                              | (Other)                      |  |
|                                                                                                                                                                           | Tests                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     | Oral exam     | 1.0                                                                                                                                                                                                                                                                              | (Other)                      |  |
|                                                                                                                                                                           | Written exam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 3.0 | Project       |                                                                                                                                                                                                                                                                                  | (Other)                      |  |
| Grading and evaluating student work in class and at the final exam                                                                                                        | <div>The final grade passed pursuant to mark partial exams, seminars and laboratory exercises.</div> <div>Scoring: &lt;60% insufficient; 60-70% sufficient (2); 70-80% good(3); 80-90% very good (4); 90-100% excellent (5).</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |               |                                                                                                                                                                                                                                                                                  |                              |  |
| Required literature (available in the library and via other                                                                                                               | Title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |               | Number of copies in the library                                                                                                                                                                                                                                                  | Availability via other media |  |

|                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |     |
|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----|
| media)                                                                      | R. S. Jackson: Wine Science, 4th Ed., Principles and Applications, Academic Press, 2008                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  | Web |
|                                                                             | R. Boulton, V. L. Singleton, L. F. Bisson, R. E. Kunkee: Principles and Practice of Winemaking Chapman/Hall, New York, 1996.                                                                                                                                                                                                                                                                                                                                                                                                                             |  | Web |
| Optional literature (at the time of submission of study programme proposal) | P. Ribereau-Gayon, D. Dubourdieu, B. Doneche, A. Lonvaud: Handbook of Enology - The Microbiology of Wine and Vinifications, Vol 1, 2nd Edition, Chapman&Hall, New York, 2006.<br>P. Ribereau-Gayon, Y. Glories, A. Maujean, D. Dubourdieu: Handbook of Enology - Stabilization and Treatments 2nd Edition, Chapman&Hall, New York, 2006.<br>C.S. Ough, M.A. Amerine: Methods for Analysis of musts and wines, 2nd edition, John Wiley & Sons, New York, 1988.<br>A. G. Reynolds: Managing wine quality CRC Press, 2010.<br>Selected scientific articles. |  |     |
| Quality assurance methods that ensure the acquisition of exit competences   | Quality assurance will be performed at three levels: (1) University Level; (2) Faculty Level by Quality Control Committee; (3) Lecturer's Level.                                                                                                                                                                                                                                                                                                                                                                                                         |  |     |
| Other (as the proposer wishes to add)                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |     |

## Biochemical Engineering

| NAME OF THE COURSE                                                                            |                                                                                                                                                                                                                                                                                                                                                                                              | Biochemical Engineering                    |     |    |    |   |  |
|-----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-----|----|----|---|--|
| Code                                                                                          | KTM104                                                                                                                                                                                                                                                                                                                                                                                       | Year of study                              | 1st |    |    |   |  |
| Course teacher                                                                                | Ph. D. Sandra Svilović,<br>Associate Professor                                                                                                                                                                                                                                                                                                                                               | Credits (ECTS)                             | 6.0 |    |    |   |  |
| Associate teachers                                                                            | Ph. D. Antonija Čelan                                                                                                                                                                                                                                                                                                                                                                        | Type of instruction<br>(number of hours)   | L   | S  | E  | F |  |
|                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                              |                                            | 30  | 15 | 15 | 0 |  |
| Status of the course                                                                          | Mandatory                                                                                                                                                                                                                                                                                                                                                                                    | Percentage of<br>application of e-learning |     |    |    |   |  |
| COURSE DESCRIPTION                                                                            |                                                                                                                                                                                                                                                                                                                                                                                              |                                            |     |    |    |   |  |
| Course objectives                                                                             | Mastering the engineering principles in chemistry, biochemistry and food technology                                                                                                                                                                                                                                                                                                          |                                            |     |    |    |   |  |
| Course enrolment<br>requirements and<br>entry competences<br>required for the<br>course       |                                                                                                                                                                                                                                                                                                                                                                                              |                                            |     |    |    |   |  |
| Learning outcomes<br>expected at the<br>level of the course<br>(4 to 10 learning<br>outcomes) | After completing the course, the student will be able to:<br>- differentiate homogenous and heterogeneous reaction kinetics<br>- describe various types of reactors and bioreactors<br>- differentiate chemical processes and bioprocesses<br>- perceive basis of biseparation<br>- define particularities of mixing and aeration in bioprocesses<br>- describe basic measurment instruments |                                            |     |    |    |   |  |
| Course content<br>broken down in<br>detail by weekly<br>class schedule                        | 1st week: Similarity and differences between reaction engineering and biochemical engineering; reactor and bioreactor<br>2nd week: Kinetics of homogenous and heterogeneous chemical reactions<br>3rd week: Kinetics of homogenous and heterogeneous chemical reactions-                                                                                                                     |                                            |     |    |    |   |  |

|                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |               |                                                                                                                                                                                                                                       |                              |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|--|
| (syllabus)                                                                                                                                                       | numerical problems.<br>4th week: Models for ideal reactors<br>5th week: Ideal reactors--numerical problems<br>6th week: Substrate preparation. Sterilization<br>7th week: Biocatalysts. Immobilized biocatalysts. Features of engineering enzymatic processes.<br>8th week: Enzyme kinetics – numerical problems (Partial knowledge test)<br>9th week: Features of engineering fermentation processes Bioreactors<br>10th week: Bioreactors for microbial cell culture. Bioreactors for plant and animal cell and tissue culture. Enzyme bioreactors.<br>11th week: Bioreactors evaluation and ratings<br>12th week: Transport phenomena in bioprocess systems<br>13th week: Aeration. Mixing in bioprocess systems<br>14th week: Separations in biotechnology<br>15th week: Bioprocess control (Partial knowledge test)<br>Exercises: Aeration. Determination of diffusion coefficient. Crystallization. Mathcad. Enzyme kinetics – Modelling data using Mathcad (Michaelis-Menten, Lineweaver-Burk, Eadie-Hofstee and Hanes-Woolf model). |     |               |                                                                                                                                                                                                                                       |                              |  |
| Format of instruction                                                                                                                                            | <input checked="" type="checkbox"/> lectures<br><input type="checkbox"/> seminars and workshops<br><input checked="" type="checkbox"/> exercises<br><input type="checkbox"/> on line in entirety<br><input type="checkbox"/> partial e-learning<br><input type="checkbox"/> field work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     |               | <input checked="" type="checkbox"/> independent assignments<br><input type="checkbox"/> multimedia<br><input checked="" type="checkbox"/> laboratory<br><input type="checkbox"/> work with mentor<br><input type="checkbox"/> (other) |                              |  |
| Student responsibilities                                                                                                                                         | Regular attendance and active participation at lectures, and exercises.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |     |               |                                                                                                                                                                                                                                       |                              |  |
| Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course) | Class attendance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     | Research      |                                                                                                                                                                                                                                       | Practical training           |  |
|                                                                                                                                                                  | Experimental work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.5 | Report        |                                                                                                                                                                                                                                       | (Other)                      |  |
|                                                                                                                                                                  | Essay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     | Seminar essay |                                                                                                                                                                                                                                       | (Other)                      |  |
|                                                                                                                                                                  | Tests                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 1.5 | Oral exam     | 1.0                                                                                                                                                                                                                                   | (Other)                      |  |
|                                                                                                                                                                  | Written exam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 3.0 | Project       |                                                                                                                                                                                                                                       | (Other)                      |  |
| Grading and evaluating student work in class and at the final exam                                                                                               | A student can pass a part or the entire exam by taking two partial tests during the semester. Students who do not pass the partial exams have to take an exam in the regular examination term. During the examination terms students take written and oral exam.<br>Scoring: <55% insufficient; 55-66% sufficient (2); 67-79% good (3); 80-92% very good (4); 93-100% excellent (5)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |               |                                                                                                                                                                                                                                       |                              |  |
| Required literature (available in the library and via other media)                                                                                               | Title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |               | Number of copies in the library                                                                                                                                                                                                       | Availability via other media |  |
|                                                                                                                                                                  | Z. Gomzi: Kemijski reaktori, Hinus, Zagreb, 1998 (I izdanje); 2009 (II izdanje).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |               | 10                                                                                                                                                                                                                                    |                              |  |
|                                                                                                                                                                  | V. Marić, B. Šantek. Biokemijsko inženjerstvo, Zagreb, 2009                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |               |                                                                                                                                                                                                                                       | Yes                          |  |
| Optional literature (at the time of submission of study programme proposal)                                                                                      | A. Vrsalović Presečki: Bioreakcijska tehnika II, Interna skripta, Fakultet kemijskog inženjerstva i tehnologije, Zagreb, 2013.<br>Z. Findik Blažević: Bioreakcijska tehnika I, Interna skripta, Fakultet kemijskog inženjerstva i tehnologije, Zagreb, 2013.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |     |               |                                                                                                                                                                                                                                       |                              |  |
| Quality assurance methods that ensure the                                                                                                                        | Quality assurance will be performed at three levels: (1) University Level; (2) Faculty Level by Quality Control Committee; (3) Lecturer's Level.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |               |                                                                                                                                                                                                                                       |                              |  |





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|                                                                                                                                                                           | 11th week: Mediterranean diet and healthy balance<br>12th week: Mediterranean diet and obesity<br>13th week: Mediterranean diet and diabetes type 2<br>14th week: Mediterranean diet and osteoporosis<br>15th week: Mediterranean diet and cancers<br>Seminar work:<br>Determination of the adipose tissue using caliper and automatic measurement of human subcutaneous fat; to structure 24 hours dietary recall questionnaires and results validation; calculation of the body mass index and the dietary status; to compose daily and weekly dietary regimes according to principles of the Mediterranean diet; calculation of daily energy need requirements for targeted population. |     |               |                                                                                                                                                                                                                            |                                 |                              |
| Format of instruction                                                                                                                                                     | <input checked="" type="checkbox"/> lectures<br><input type="checkbox"/> seminars and workshops<br><input checked="" type="checkbox"/> exercises<br><input type="checkbox"/> <i>on line</i> in entirety<br><input type="checkbox"/> partial e-learning<br><input type="checkbox"/> field work                                                                                                                                                                                                                                                                                                                                                                                              |     |               | <input type="checkbox"/> independent assignments<br><input checked="" type="checkbox"/> multimedia<br><input type="checkbox"/> laboratory<br><input type="checkbox"/> work with mentor<br><input type="checkbox"/> (other) |                                 |                              |
| Student responsibilities                                                                                                                                                  | Active participation in all lectures (70%) and seminars (80%).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |               |                                                                                                                                                                                                                            |                                 |                              |
| Screening student work ( <i>name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course</i> ) | Class attendance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1.0 | Research      |                                                                                                                                                                                                                            | Practical training              |                              |
|                                                                                                                                                                           | Experimental work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     | Report        |                                                                                                                                                                                                                            | (Other)                         |                              |
|                                                                                                                                                                           | Essay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     | Seminar essay |                                                                                                                                                                                                                            | (Other)                         |                              |
|                                                                                                                                                                           | Tests                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     | Oral exam     | 2.0                                                                                                                                                                                                                        | (Other)                         |                              |
|                                                                                                                                                                           | Written exam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1.0 | Project       |                                                                                                                                                                                                                            | (Other)                         |                              |
| Grading and evaluating student work in class and at the final exam                                                                                                        | Final grade includes the success from partial written exams (2) and oral exam. Grading: <60% not sufficient; 60-70% sufficient (2); 70-80% good (3); 80-90% very good (4); 90-100% excellent (5).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     |               |                                                                                                                                                                                                                            |                                 |                              |
| Required literature (available in the library and via other media)                                                                                                        | Title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     |               |                                                                                                                                                                                                                            | Number of copies in the library | Availability via other media |
|                                                                                                                                                                           | T. Bilušić: Dijetetika, on-line revised lectures, Kemijsko tehnološki fakultetu u Splitu, 2013.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |               |                                                                                                                                                                                                                            |                                 | web                          |
|                                                                                                                                                                           | T. Bilušić: Osnove znanosti o hrani, on-line revised lectures, Kemijsko tehnološki fakultetu u Splitu, 2013.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |               |                                                                                                                                                                                                                            |                                 | web                          |
|                                                                                                                                                                           | V. Katalinić: Temeljno znanje o prehrani, Sveučilišni priručnik, Kemijsko tehnološki fakultetu u Splitu, 2011.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |               |                                                                                                                                                                                                                            |                                 | web                          |
|                                                                                                                                                                           | G. Krešić: Trendovi u prehrani, Fakultet za menadžment u ugostiteljstvu i turizmu, Opatija, 2012.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     |               |                                                                                                                                                                                                                            | 1                               |                              |
| Optional literature (at the time of submission of study programme proposal)                                                                                               | R. Živković: Dijetetika, Medicinska naklada, Zagreb, 2002.<br>J. S. Garrow, W.P.T. James: Human nutrition and dietetics. 10th Edition, Churchill Livingstone, Co. London, 2000.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |               |                                                                                                                                                                                                                            |                                 |                              |
| Quality assurance methods that                                                                                                                                            | Quality assurance will be performed at three levels: (1) University Level; (2) Faculty Level by Quality Control Committee; (3) Lecturer's Level.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |               |                                                                                                                                                                                                                            |                                 |                              |



|                                            |  |
|--------------------------------------------|--|
| ensure the acquisition of exit competences |  |
| Other (as the proposer wishes to add)      |  |

## Sustainable Technologies in Food Industry

| NAME OF THE COURSE                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Sustainable Technologies in Food Industry |     |    |   |   |  |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-----|----|---|---|--|
| Code                                                                              | KTM106                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Year of study                             | 1st |    |   |   |  |
| Course teacher                                                                    | Ph. D. Marina Trgo, Full Professor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Credits (ECTS)                            | 4.5 |    |   |   |  |
| Associate teachers                                                                | Ph. D. Ivona Nuić                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Type of instruction (number of hours)     | L   | S  | E | F |  |
|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                           | 30  | 15 | 0 | 0 |  |
| Status of the course                                                              | Mandatory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Percentage of application of e-learning   |     |    |   |   |  |
| COURSE DESCRIPTION                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                           |     |    |   |   |  |
| Course objectives                                                                 | Application of the principles of sustainable development in the food industry and strengthening of sustainable technologies in food production and processing.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                           |     |    |   |   |  |
| Course enrolment requirements and entry competences required for the course       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                           |     |    |   |   |  |
| Learning outcomes expected at the level of the course (4 to 10 learning outcomes) | After passing the exam, the student is able to:<br>- explain the meaning and possibilities of application of the concept of sustainability in the food industry<br>- describe current and expected holders of introducing sustainable practices in the food industry<br>- define strategic activities to achieve sustainability of the food industry in our country and in the world<br>- explain the life cycle assessment of products of the food industry and its impact on the environment<br>- apply the concept of zero emissions on selected examples.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                           |     |    |   |   |  |
| Course content broken down in detail by weekly class schedule (syllabus)          | 1st week: Introductory lecture: sustainability in the food-producing sector. Troubleshooting by application of sustainable technologies.<br>2nd week: Ecological footprint of the food industry. The impact on carbon footprint and food footprint.<br>3rd week: Overview of emissions from the food industry into the air, water and soil. Waste water, solid waste and air pollution.<br>4th week: Analysis of the sources of waste in the food supply chain, waste from agricultural production, waste from industrial food processing and opportunities provided by the introduction of sustainable practices.<br>5th week: Waste management of food industry throughout the life cycle assessment of the product.<br>6th week: Application of the concept of zero emissions in the food industry.<br>7th week: Harmful substances in food originating from the environment (soil, water and air, the remains of the plants treatment, the remains of the animals treatment, the remains of the action of microorganisms, harmful substances generated during |                                           |     |    |   |   |  |

|                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |               |                                                                                                                                                                                                                                       |                    |                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------------------------------|
|                                                                                                                                                                | food processing, residues from washing, disinfection and fumigation)<br>8th week: Measures for reducing harmful substances in food. Integrated management of pesticides. Organic production.<br>9th week: The role of the quality assurance system in achieving sustainable food industry.<br>10th week: An integrated approach to energy use in the food industry.<br>11th week: Case study: Sustainable technologies in bread production.<br>12th week: Case study: Sustainable technologies in production and processing in the meat industry.<br>13th week: Case study: Sustainable technologies in the dairy industry.<br>14th week: Case study: Sustainable technologies in the processing of fruit and vegetables. Sustainable technologies in the sugar production.<br>15th week: Case study: Sustainable technologies in the beer production. |     |               |                                                                                                                                                                                                                                       |                    |                              |
| Format of instruction                                                                                                                                          | <input checked="" type="checkbox"/> lectures<br><input checked="" type="checkbox"/> seminars and workshops<br><input type="checkbox"/> exercises<br><input type="checkbox"/> on line in entirety<br><input type="checkbox"/> partial e-learning<br><input type="checkbox"/> field work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |               | <input checked="" type="checkbox"/> independent assignments<br><input checked="" type="checkbox"/> multimedia<br><input type="checkbox"/> laboratory<br><input type="checkbox"/> work with mentor<br><input type="checkbox"/> (other) |                    |                              |
| Student responsibilities                                                                                                                                       | Attending lectures is 80%, while seminars 100% of the total hours.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |     |               |                                                                                                                                                                                                                                       |                    |                              |
| Screening student work(name the proportion of ECTS credits for eachactivity so that the total number of ECTS credits is equal to the ECTS value of the course) | Class attendance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 1.5 | Research      |                                                                                                                                                                                                                                       | Practical training |                              |
|                                                                                                                                                                | Experimental work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     | Report        |                                                                                                                                                                                                                                       | (Other)            |                              |
|                                                                                                                                                                | Essay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     | Seminar essay | 1.5                                                                                                                                                                                                                                   | (Other)            |                              |
|                                                                                                                                                                | Tests                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.5 | Oral exam     | 0.5                                                                                                                                                                                                                                   | (Other)            |                              |
|                                                                                                                                                                | Written exam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.5 | Project       |                                                                                                                                                                                                                                       | (Other)            |                              |
| Grading and evaluating student work in class and at the final exam                                                                                             | The entire exam can be applied over the three written evaluation during the semester. Passing threshold is 60%. Students who have not passed evaluation during the semester should attend at the final exam in the regular examination period. Final exam will include written and oral exam. Passing threshold is also 60%. Rating: 60% -69% - satisfactory, 70% -79% - good, 80% -89% very good, 90% -100% - excellent.                                                                                                                                                                                                                                                                                                                                                                                                                              |     |               |                                                                                                                                                                                                                                       |                    |                              |
| Required literature (available in the library and via other media)                                                                                             | Title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |               | Number of copies in the library                                                                                                                                                                                                       |                    | Availability via other media |
|                                                                                                                                                                | Održive tehnologije u prehrambenoj industriji R. Grujić, M. Jašić (Ur.), Knjiga 2, Novi sad, Tehnološki fakultet, 2013.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |     |               | -                                                                                                                                                                                                                                     |                    | at course teacher            |
|                                                                                                                                                                | Održive tehnologije, Z. Zavrago (Ur.), Knjiga 1, Novi sad, Tehnološki fakultet, 2013.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |               | -                                                                                                                                                                                                                                     |                    | at course teacher            |
|                                                                                                                                                                | L. Pavičić-Rogošić: Održivi razvoj, Odraz, 2010.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |               | -                                                                                                                                                                                                                                     |                    | at course teacher            |
|                                                                                                                                                                | Strategic guidelines for the development of the food-processing sector 2013th to 2020th, Cluster competitiveness of the food-processing sector, the Ministry of Economy Republic of Croatia.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |               | -                                                                                                                                                                                                                                     |                    | at course teacher            |
|                                                                                                                                                                | Lj. Matijašević, Održive tehnologije u procesima proizvodnje piva, Kemija u industriji 64 (2015) 540-546.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |     |               |                                                                                                                                                                                                                                       |                    | at course teacher            |
| Optional literature (at the time of                                                                                                                            | Održive tehnologije i kemijska industrija, M. Jašić, M. Burgić, E. Ahmetović (Ur.), Knjiga 4. Novi sad. Tehnološki fakultet, 2013.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |     |               |                                                                                                                                                                                                                                       |                    |                              |

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| submission of study programme proposal)                                   | Scientific and technical papers                                                                                                                 |
| Quality assurance methods that ensure the acquisition of exit competences | Quality assurance will be performed at three levels: (1) University Level; (2) Faculty Level by Quality Control Committee; (3) Lecturer's Level |
| Other (as the proposer wishes to add)                                     | Suggestions and reactions of participants during the semester. Student survey.                                                                  |

## Process Design

| NAME OF THE COURSE                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Process Design                          |     |    |   |   |  |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|----|---|---|--|
| Code                                                                              | KTM107                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Year of study                           | 1st |    |   |   |  |
| Course teacher                                                                    | Ph. D. Nediljka Vukojević Medvidović, Associate Professor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Credits (ECTS)                          | 7.0 |    |   |   |  |
| Associate teachers                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Type of instruction (number of hours)   | L   | S  | E | F |  |
|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                         | 30  | 30 | 0 | 0 |  |
| Status of the course                                                              | Mandatory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Percentage of application of e-learning |     |    |   |   |  |
| COURSE DESCRIPTION                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                         |     |    |   |   |  |
| Course objectives                                                                 | Students will know the basic principles and the methodology of process equipment design. They will also acquire knowledge of the methodology used in chemical process industry to evaluate the ultimate commercial feasibility.                                                                                                                                                                                                                                                                                                                                                                                                                  |                                         |     |    |   |   |  |
| Course enrolment requirements and entry competences required for the course       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                         |     |    |   |   |  |
| Learning outcomes expected at the level of the course (4 to 10 learning outcomes) | After passing the exam, the student is able to:<br>- define the stages in the design and modification of chemical processes<br>- choose the optimum location of plants<br>- explain the research and development in the laboratory and pilot scale<br>- scale up of process and apparatus of the chemical process industry<br>- estimate of financial viability of the investment<br>- explain synthesis, optimization and simulation of process scheme<br>- carry out synthesis of heat exchanger network using pinch analysis<br>- dimensioned heat exchanger, the continuous distillation of a multicomponent mixture, separators, pipelines. |                                         |     |    |   |   |  |
| Course content broken down in detail by weekly class schedule (syllabus)          | 1st week: Introduction. Design, optimization, sustainable development. Steps in the design and development of new processing plants. The project leader.<br>2nd week: From idea to product. Idea. Preliminary works . A feasibility study . Numerical examples. Process development and evaluation. Selection and design of project equipment. Project engineering. Process engineering. Construction of the plant .<br>3rd week: Plant location. Location factors. Methods of evaluation of location factors. Numerical examples.<br>4th week: The process development. Process research in laboratory and industrial                           |                                         |     |    |   |   |  |

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|                                                                                                                                                                          | <p>scale.</p> <p>5th week: Scaling up of process and apparatus of the chemical process industry. Similarity low. Models and scaling up methods in chemical engineering. Numerical examples .</p> <p>6th week: The rating process. The rating of the financial performance of investments. Estimation of investment costs. Estimation of production costs. Methods for the evaluation of financial viability of the investment. Numerical examples.</p> <p>7th week: Process design. Synthesis, optimization and flowsheet simulation. Material and energy balance. Numerical examples.</p> <p>8th week: Synthesis and process integration. A hierarchical approach. Model of onion. A holistic approach to the integration process. Pinch analysis. Synthesis of heat exchanger network by pinch analysis.</p> <p>9th week: A graphical method. Analytical method of temperature intervals . Performance of heat exchanger network above and below pincha. Numerical examples .</p> <p>10th week: Heat transfer. Classification. Analysis of the processes of heat transfer. Calculation of the heat exchanger using the mean logarithmic differences of temperature. Calculation of the heat exchanger using heat efficiency.</p> <p>11th week: Sizing the heat exchanger. Heat calculation. Mechanical calculation. Numerical examples.</p> <p>12th week. Determining the optimal thickness of insulation. A numerical example.</p> <p>13th week: Sizing distillation columns. The multicomponent mixtures . The distribution of the components . Vapor-liquid equilibrium. Temperature of boiling and dew point. Calculation of Underwoodova parameter <math>\theta</math> using Newton's method. Numerical examples.</p> <p>14th week: Sizing the continuous distillation of a multicomponent mixture. The heat duty of the condenser and reboiler. Numerical examples.</p> <p>15th week: Sizing separators. Sizing pipelines. Numerical examples.</p> |     |               |                                                                                                                                                                                                                                       |                              |  |
| Format of instruction                                                                                                                                                    | <input checked="" type="checkbox"/> lectures<br><input checked="" type="checkbox"/> seminars and workshops<br><input type="checkbox"/> exercises<br><input type="checkbox"/> <i>on line</i> in entirety<br><input type="checkbox"/> partial e-learning<br><input type="checkbox"/> field work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |     |               | <input checked="" type="checkbox"/> independent assignments<br><input checked="" type="checkbox"/> multimedia<br><input type="checkbox"/> laboratory<br><input type="checkbox"/> work with mentor<br><input type="checkbox"/> (other) |                              |  |
| Student responsibilities                                                                                                                                                 | Attending lectures is 80%, while seminars 100% of the total hours.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |               |                                                                                                                                                                                                                                       |                              |  |
| Screening student work( <i>name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course</i> ) | Class attendance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 3.0 | Research      |                                                                                                                                                                                                                                       | Practical training           |  |
|                                                                                                                                                                          | Experimental work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     | Report        |                                                                                                                                                                                                                                       | (Other)                      |  |
|                                                                                                                                                                          | Essay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     | Seminar essay | 2.5                                                                                                                                                                                                                                   | (Other)                      |  |
|                                                                                                                                                                          | Tests                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 0.5 | Oral exam     | 0.5                                                                                                                                                                                                                                   | (Other)                      |  |
|                                                                                                                                                                          | Written exam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.5 | Project       |                                                                                                                                                                                                                                       | (Other)                      |  |
| Grading and evaluating student work in class and at the final exam                                                                                                       | The entire exam can be applied over the three written evaluation during the semester. Passing threshold is 60%. Students who have not passed evaluation during the semester should attend at the final exam in the regular examination period. Final exam will include written and oral exam. Passing threshold is also 60%. Rating: 60% -70% - satisfactory, 70% -80% - good, 80% -90% very good, 90% -100% - excellent.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |               |                                                                                                                                                                                                                                       |                              |  |
| Required literature (available in the library and via other media)                                                                                                       | Title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     |               | Number of copies in the library                                                                                                                                                                                                       | Availability via other media |  |
|                                                                                                                                                                          | R. Sinnott, G. Towler, Chemical Engineering Design,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |               | 1                                                                                                                                                                                                                                     |                              |  |

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|-----------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|--|
|                                                                             | Fift Edition, Butterworth-Heinemann, Amsterdam, 2009.                                                                                                                                       |   |  |
|                                                                             | W. D. Seider, J. D. Seader, D. R. Lewin: Product & Process Design Principles, Synthesis, Analysis, and Evaluation, Second Edition, John Wiley & Sons Inc. New York, 2004.                   | 1 |  |
|                                                                             | E. Beer, Priručnik za dimenzioniranje uređaja kemijske procesne industrije, HDKI/Kemija u industriji, Zagreb, 1994.;                                                                        | 1 |  |
|                                                                             | E. Beer, Destilacija, HDKI /Kemija u industriji, Zagreb, 2006.                                                                                                                              | 1 |  |
|                                                                             | M.S. Peters and K.D. Timmerhaus, Plant Design and Economics for Chemical Engineers, McGraw-Hill, New York, 2003.                                                                            | 1 |  |
|                                                                             | A. Bejan, Heat transfer, John Wiley and Sons, Inc., New York, 1993.                                                                                                                         | 1 |  |
| Optional literature (at the time of submission of study programme proposal) | R.H. Perry et al., Perry's Chemical Engineer's Handbook, 7th edition, McGraw-Hill, New York, 1997.; James M. Douglas, Conceptual Design of Chemical Processes, McGraw-Hill, New York, 1988. |   |  |
| Quality assurance methods that ensure the acquisition of exit competences   | Quality assurance will be performed at three levels: (1) University Level; (2) Faculty Level by Quality Control Committee; (3) Lecturer's Level                                             |   |  |
| Other (as the proposer wishes to add)                                       | Suggestions and reactions of participants during the semester. Student survey.                                                                                                              |   |  |

## Honey and Other Bee Products

| NAME OF THE COURSE   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Honey and Other Bee Products            |     |   |   |   |  |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|---|---|---|--|
| Code                 | KTM108                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Year of study                           | 1st |   |   |   |  |
| Course teacher       | Ph. D. Dragan Bubalo, Associate Professor<br>Ph. D. Igor Jerković, Full Professor                                                                                                                                                                                                                                                                                                                                                                                                                                        | Credits (ECTS)                          | 4.0 |   |   |   |  |
| Associate teachers   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Type of instruction (number of hours)   | L   | S | E | F |  |
|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                         | 27  | 3 | 6 | 9 |  |
| Status of the course | Mandatory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Percentage of application of e-learning |     |   |   |   |  |
| COURSE DESCRIPTION   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                         |     |   |   |   |  |
| Course objectives    | The subject goal is student's introduction to: <ul style="list-style-type: none"><li>- main traits of honey bee colony,</li><li>- anatomy – physiological traits of honey bees and their behaviour,</li><li>- tasks carried out by the honey bees in the hive, gathering activity outside the hive, in order to explain the honey formation process, the role of the pollen and propolis in honey bee colony,</li><li>- chemical composition and physical characteristics, as well as the specificities of bee</li></ul> |                                         |     |   |   |   |  |

|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
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|                                                                                   | <p>products,</p> <ul style="list-style-type: none"> <li>- analytics, botanical origin (melissopalynological analysis) and honey sensory analysis,</li> <li>- factors affecting honey flow and honey flow resources in Croatia,</li> <li>- possibility of using the apiary in touristic and educational purposes as well as the marketing and promotion of bee products through the „Apitourism“</li> <li>- differences in legal regulation in conventional and organic beekeeping,</li> <li>- alternative approach in honey bee treatment.</li> </ul> <p>The programme of the course Honey and other bee products will enable students in acquisition of basic theoretical and practical knowledge on bee products production and analytics which are necessary for successful management of companies as well for the households dealing with production and marketing of honey and other bee products, and provide a foundation for further upgrade of gained knowledge</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Course enrolment requirements and entry competences required for the course       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Learning outcomes expected at the level of the course (4 to 10 learning outcomes) | <p>After completing the course, the student will be able to:</p> <ul style="list-style-type: none"> <li>- to define direct and indirect honeybee benefits</li> <li>- to enumerate honey bee races according to production traits</li> <li>- to explain honey formation and to describe its composition and physical properties</li> <li>- to recognize main types of honey</li> <li>- to recognize honey defects</li> <li>- to rank samples within the same honey type according to sensory characteristics</li> <li>- to recognize main nectariferous plant species</li> <li>- to interpret the results of the main physico-chemical honey parameters</li> <li>- to determine the water content, to measure electrical conductivity and pH value of honey</li> <li>- to prepare honey samples for analysis</li> <li>- to plan the sequence of activities and to choose the equipment for production of honey, pollen, propolis, royal jelly, bee venom and beeswax</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Course content broken down in detail by weekly class schedule (syllabus)          | <p>1st week: Importance of beekeeping and basics of honey bee colony biology L - Direct and indirect honey bee benefits. Members of honey bee colony, basics of anatomy and physiology of honey bees and division of labour inside and outside the honey bee colony. Main traits of honey bee races.</p> <p>2nd week: Honey L - Process of honey formation. Chemical composition, physical traits and property of honey. Honey defects.</p> <p>3rd week: Nectariferous plants L – Factors affecting the honey flow. Nectary types. Honeydew occurrence. The most important continental and mediterranean nectariferous plant species.</p> <p>4th week: Honey analytics L – Introduction to physico-chemical methods used for determination of honey authenticity.</p> <p>5th week: Melissopalynological analysis LB – Determination of botanical and geographical origin of honey. Preparation of honey samples for melissopalynological analysis. Qualitative and quantitative melissopalynological analysis.</p> <p>6th week: Honey sensory analysis - L Sensory traits of main continental and mediterranean types of honey. E Honey competition.</p> <p>7th week: Field work I FW – Visit an authorized laboratory for honey analytics. Introduction to methods and instruments which used in honey and other bee products analytics.</p> <p>8th week: Law regulation L – Introduction to law regulation which concerns honey and other bee products quality in conventional and organic beekeeping. I partial exam.</p> <p>9th week: Pollen, propolis, royal jelly, bee venom and beeswax L - Chemical composition and properties of mentioned bee products and the way of their</p> |



|                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |               |                                                                                                                                                                                                                            |                                 |                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|------------------------------|
|                                                                                                                                                                           | <p>production.</p> <p>10th week: „Apitourism“ L – Possibility of using the apiary in agrotourism through tourist - educational purpose, the way of bee products marketing through apitourism.</p> <p>11th week: Alternative approach in treatment of honey bees L - Biotechnical methods and methods of using organic acids in varroa control. Alternative methods in control of other bee diseases and pests.</p> <p>12th week: Technology of bee products production E – Colony preparation for honey extraction. Honey extraction. Ways of collecting the pollen and propolis and production of royal jelly, bee venom and beeswax.</p> <p>13th week: Field work II FW – Visit to honey bottler - introduction to technology of processing and packing the honey.</p> <p>14th week: Seminar I S – Seminars from previously processed teaching units according to student's choice. Basic physico-chemical honey analysis LB – Determination of water content, electrical conductivity and pH value.</p> <p>15th week: Seminar II S – Seminars presentation. II partial exam. Examination period – final exam (oral).</p> |     |               |                                                                                                                                                                                                                            |                                 |                              |
| Format of instruction                                                                                                                                                     | <input checked="" type="checkbox"/> lectures<br><input checked="" type="checkbox"/> seminars and workshops<br><input checked="" type="checkbox"/> exercises<br><input type="checkbox"/> <i>on line</i> in entirety<br><input type="checkbox"/> partial e-learning<br><input checked="" type="checkbox"/> field work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |               | <input type="checkbox"/> independent assignments<br><input type="checkbox"/> multimedia<br><input checked="" type="checkbox"/> laboratory<br><input type="checkbox"/> work with mentor<br><input type="checkbox"/> (other) |                                 |                              |
| Student responsibilities                                                                                                                                                  | Active participation in all activities: lectures, consultations, searching the literature.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |               |                                                                                                                                                                                                                            |                                 |                              |
| Screening student work ( <i>name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course</i> ) | Class attendance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1.5 | Research      |                                                                                                                                                                                                                            | Practical training              |                              |
|                                                                                                                                                                           | Experimental work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     | Report        |                                                                                                                                                                                                                            | (Other)                         |                              |
|                                                                                                                                                                           | Essay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     | Seminar essay | 0.5                                                                                                                                                                                                                        | (Other)                         |                              |
|                                                                                                                                                                           | Tests                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     | Oral exam     | 1.0                                                                                                                                                                                                                        | (Other)                         |                              |
|                                                                                                                                                                           | Written exam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1.0 | Project       |                                                                                                                                                                                                                            | (Other)                         |                              |
| Grading and evaluating student work in class and at the final exam                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |               |                                                                                                                                                                                                                            |                                 |                              |
| Required literature (available in the library and via other media)                                                                                                        | Title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |               |                                                                                                                                                                                                                            | Number of copies in the library | Availability via other media |
|                                                                                                                                                                           | N. Kezić, D. Bubalo, Z. Grgić, M. Dražić, D. Barišić, J. Filipi, M. Ševar, D. Krakar, V. Tretinjak: Konvencionalno i ekološko pčelarenje, Interna skripta, Agronomski fakultet Sveučilišta u Zagrebu, Zagreb, 2013.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |               |                                                                                                                                                                                                                            | 1                               |                              |
|                                                                                                                                                                           | F. Šimić: Naše medonosno bilje, Nakladni zavod Znanje, Zagreb, 1980.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |               |                                                                                                                                                                                                                            | 1                               |                              |
|                                                                                                                                                                           | E. Crane: Honey. A comprehensive survey, Heinemann, London, 1975.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |               |                                                                                                                                                                                                                            | 1                               |                              |
| Optional literature (at the time of submission of study programme proposal)                                                                                               | The Hive and the Honey Bee, Dadant & Sons Hamilton, 1987.<br>H. Horn, C. Lulmann: DasgrosseHonigbuch, München, 1992.<br>Časopis „Hrvatska pčela“, Hrvatski pčelarski savez, Zagreb                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     |               |                                                                                                                                                                                                                            |                                 |                              |
| Quality assurance                                                                                                                                                         | Quality assurance will be performed at three levels: (1) University Level; (2) Faculty                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     |               |                                                                                                                                                                                                                            |                                 |                              |





|                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |               |                                                                                                                                                                                                                                                  |                              |  |
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|                                                                                                                                                                           | 10th week: Minimal processing<br>11th week: “Green” food processing technologies<br>12th week: Advancements in post-harvest management<br>13th week: Development of value-added products from food wastes<br>14th week: Encapsulation technologies<br>15th week: Nanotechnology in food and agriculture industry, II. Colloquium                                                                                                                                                                                                                                                                        |     |               |                                                                                                                                                                                                                                                  |                              |  |
| Format of instruction                                                                                                                                                     | <input checked="" type="checkbox"/> lectures<br><input type="checkbox"/> seminars and workshops<br><input checked="" type="checkbox"/> exercises<br><input type="checkbox"/> <i>on line</i> in entirety<br><input type="checkbox"/> partial e-learning<br><input checked="" type="checkbox"/> field work                                                                                                                                                                                                                                                                                                |     |               | <input checked="" type="checkbox"/> independent assignments<br><input checked="" type="checkbox"/> multimedia<br><input checked="" type="checkbox"/> laboratory<br><input type="checkbox"/> work with mentor<br><input type="checkbox"/> (other) |                              |  |
| Student responsibilities                                                                                                                                                  | Active participation in all activities: lectures, consultations, searching the literature.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |     |               |                                                                                                                                                                                                                                                  |                              |  |
| Screening student work ( <i>name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course</i> ) | Class attendance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1.0 | Research      |                                                                                                                                                                                                                                                  | Practical training           |  |
|                                                                                                                                                                           | Experimental work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     | Report        |                                                                                                                                                                                                                                                  | (Other)                      |  |
|                                                                                                                                                                           | Essay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     | Seminar essay | 1.0                                                                                                                                                                                                                                              | (Other)                      |  |
|                                                                                                                                                                           | Tests                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     | Oral exam     | 0.5                                                                                                                                                                                                                                              | (Other)                      |  |
|                                                                                                                                                                           | Written exam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2.5 | Project       |                                                                                                                                                                                                                                                  | (Other)                      |  |
| Grading and evaluating student work in class and at the final exam                                                                                                        | The final grade is based on the evaluation of partial exams, seminars and laboratory exercises.<br>Scoring: <60% insufficient; 60-70% sufficient (2); 70-80% good (3); 80-90% very good (4); 90-100% excellent (5).                                                                                                                                                                                                                                                                                                                                                                                     |     |               |                                                                                                                                                                                                                                                  |                              |  |
| Required literature (available in the library and via other media)                                                                                                        | Title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |               | Number of copies in the library                                                                                                                                                                                                                  | Availability via other media |  |
|                                                                                                                                                                           | J. I. Boye, Y. Arcand: Green Technologies in Food Production and Processing, Springer, New York, 2012.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |               |                                                                                                                                                                                                                                                  | Yes                          |  |
|                                                                                                                                                                           | H. Q. Zhang, G. V. Barbosa-Canovas, V. M. Balasubramaniam, C. P. Dunne, D. F. Farkas, J. T. C. Yuan: Nonthermal Processing Technologies for Food, John Wiley & Sons, Ltd., 2011.                                                                                                                                                                                                                                                                                                                                                                                                                        |     |               |                                                                                                                                                                                                                                                  | Yes                          |  |
| Optional literature (at the time of submission of study programme proposal)                                                                                               | A. Malik, Z. Erginkaya, S. Ahmad, H. Erten: Food Processing: Strategies for Quality Assessment, Springer, New York, 2014.<br>D. Sun: Thermal Food Processing: New Technologies and Quality Issues, Second Edition,CRC Press, 2012.<br>N. J. Zuidam, V. A. Nedović: Encapsulation Technologies for Active Food Ingredients and Food Processing, Springer, New York, 2010.<br>D. Sun: Emerging Technologies for Food Processing, Elsevier Academic Press, 2005.<br>G. V. Barbosa-Cánovas, M. S. Tapia, M. Pilar Cano: Novel Food Processing Technologies, CRC Press, 2005.<br>Selected scientific papers. |     |               |                                                                                                                                                                                                                                                  |                              |  |
| Quality assurance methods that ensure the acquisition of exit competences                                                                                                 | Quality assurance will be performed at three levels: (1) University Level; (2) Faculty Level by Quality Control Committee; (3) Lecturer’s Level.                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |               |                                                                                                                                                                                                                                                  |                              |  |
| Other (as the proposer wishes to add)                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |               |                                                                                                                                                                                                                                                  |                              |  |

## Fermented dairy products and cheesemaking

| NAME OF THE COURSE                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Fermented dairy products and cheesemaking |     |    |    |    |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-----|----|----|----|
| Code                                                                              | KTM110                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Year of study                             | 1st |    |    |    |
| Course teacher                                                                    | Ph. D. Tea Bilušić, Full Professor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Credits (ECTS)                            | 6.0 |    |    |    |
| Associate teachers                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Type of instruction (number of hours)     | L   | S  | E  | F  |
|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                           | 30  | 15 | 20 | 10 |
| Status of the course                                                              | Mandatory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Percentage of application of e-learning   | 30% |    |    |    |
| COURSE DESCRIPTION                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                           |     |    |    |    |
| Course objectives                                                                 | Objectives of this course are to learn new knowledge on the processing of fermented dairy products and cheesemaking and their nutritional and health aspects.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                           |     |    |    |    |
| Course enrolment requirements and entry competences required for the course       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                           |     |    |    |    |
| Learning outcomes expected at the level of the course (4 to 10 learning outcomes) | <p>Learning outcomes are the following:</p> <ul style="list-style-type: none"> <li>- to distinguish categories of fermented dairy products</li> <li>- to know the processing technology used in the production of fermented dairy products</li> <li>- to understand the mechanisms and interactions between human gut microflora and fermented dairy products</li> <li>- to distinguish cheese categories</li> <li>- to understand the process of cheesemaking</li> <li>- to understand the process of cheese ripening</li> <li>- to understand the role of microorganisms (bacteria and molds) in cheesemaking</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                           |     |    |    |    |
| Course content broken down in detail by weekly class schedule (syllabus)          | <p>1st week: Physico-chemical characteristics of milk for the production of fermented dairy products and cheese.</p> <p>2nd week: Main categories of fermented dairy products and their nutritive value.</p> <p>3rd week: Processing of fermented dairy products.</p> <p>4th week: Probiotics and prebiotics – their role in the production of fermented dairy products.</p> <p>5th week: Deterioration processes in fermented dairy products.</p> <p>6th week: Sensory characteristics of fermented dairy products.</p> <p>7th week: Quality control in the production of fermented dairy products.</p> <p>8th week: The history of cheese making and main categories of cheese.</p> <p>9th week: Chemical composition of cheese and its nutritive and health value.</p> <p>10th week: Processes in cheesemaking.</p> <p>11th week: Processing in cheesemaking.</p> <p>12th week. Cheese ripening.</p> <p>13th week. The role of microorganisms in cheesemaking.</p> <p>14th Deterioration processes in cheesemaking.</p> <p>15th Trends in cheesemaking technology.</p> <p>Seminars: The use of new technologies in the production of fermented dairy products, the official procedure of the protection of Croatian autochthonous cheese.</p> |                                           |     |    |    |    |

|                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |               |                                                                                                                                                                                                                                       |                    |                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------------------------------|
|                                                                                                                                                                           | new technologies in the prolongation of fermented dairy products shel-life).<br>Laboratory work:<br>- The production of jogurth and the determination of the rate of sineresis, its sensory quality and viscosity)<br>- The comparison of physico-chemical properties of classic and fruity jogurth<br>- Determination of the rate of degradation of proteins from fermented dairy products after <i>in vitro</i> digestion model<br>- Determination of diacetyl content in various fermented dairy products<br>- Determination of jogurth texture containing different lipid content<br>- The production of cheese (from casein and albumin)<br>- The determination of physico-chemical properties of cheese (moisture content, salt, lipid content, proteins) |     |               |                                                                                                                                                                                                                                       |                    |                              |
| Format of instruction                                                                                                                                                     | <input checked="" type="checkbox"/> lectures<br><input checked="" type="checkbox"/> seminars and workshops<br><input checked="" type="checkbox"/> exercises<br><input type="checkbox"/> <i>on line</i> in entirety<br><input type="checkbox"/> partial e-learning<br><input type="checkbox"/> field work                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |               | <input type="checkbox"/> independent assignments<br><input checked="" type="checkbox"/> multimedia<br><input checked="" type="checkbox"/> laboratory<br><input type="checkbox"/> work with mentor<br><input type="checkbox"/> (other) |                    |                              |
| Student responsibilities                                                                                                                                                  | Active participation in lectures (70%), seminars (80%) and in laboratory work (100%).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |               |                                                                                                                                                                                                                                       |                    |                              |
| Screening student work ( <i>name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course</i> ) | Class attendance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1.0 | Research      |                                                                                                                                                                                                                                       | Practical training |                              |
|                                                                                                                                                                           | Experimental work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1.0 | Report        |                                                                                                                                                                                                                                       | (Other)            |                              |
|                                                                                                                                                                           | Essay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     | Seminar essay |                                                                                                                                                                                                                                       | (Other)            |                              |
|                                                                                                                                                                           | Tests                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1.0 | Oral exam     | 2.0                                                                                                                                                                                                                                   | (Other)            |                              |
|                                                                                                                                                                           | Written exam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1.0 | Project       |                                                                                                                                                                                                                                       | (Other)            |                              |
| Grading and evaluating student work in class and at the final exam                                                                                                        | Final grade includes the success from partial written exams (2) and from the exam of the laboratory practices.<br>Grading: <60% not sufficient; 60-70% sufficient (2); 70-80% good (3); 80-90% very good (4); 90-100% excellent (5).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |               |                                                                                                                                                                                                                                       |                    |                              |
| Required literature (available in the library and via other media)                                                                                                        | Title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |               | Number of copies in the library                                                                                                                                                                                                       |                    | Availability via other media |
|                                                                                                                                                                           | D. Samaržija: Fermentirana mlijeka, Udžbenici Sveučilišta u Zagrebu Zagreb, 2015.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |               | 1                                                                                                                                                                                                                                     |                    |                              |
|                                                                                                                                                                           | R. Božanić, I. Jeličić, T. Bilušić: Analiza mlijeka i mliječnih proizvoda, Plejada Zagreb, 2010.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |     |               | 2                                                                                                                                                                                                                                     |                    |                              |
|                                                                                                                                                                           | Havranek i sur.:Sirarstvo, HMU, Zagreb, 2014.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |               | 1                                                                                                                                                                                                                                     |                    |                              |
|                                                                                                                                                                           | A. Tamime: Fermented milks, Blackwell Publishing Ltd, 2006.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |     |               | 1                                                                                                                                                                                                                                     |                    |                              |
| Optional literature (at the time of submission of study programme proposal)                                                                                               | M. Tunick: The science of cheese, Oxford University Press, 2014.<br>Lj. Tratnik, R. Božanić: Mlijeko i mliječni proizvodi, HMU, Zagreb, 2012                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |               |                                                                                                                                                                                                                                       |                    |                              |
| Quality assurance methods that ensure the acquisition of exit competences                                                                                                 | Quality assurance will be performed at three levels: (1) University Level; (2) Faculty Level by Quality Control Committee; (3) Lecturer's Level.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |     |               |                                                                                                                                                                                                                                       |                    |                              |
| Other (as the proposer wishes to                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |               |                                                                                                                                                                                                                                       |                    |                              |

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## Olive Processing Technologies

| NAME OF THE COURSE                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Olive Processing Technologies           |     |    |    |    |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|----|----|----|
| Code                                                                              | KTM200                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Year of study                           | 2nd |    |    |    |
| Course teacher                                                                    | Ph. D. Ivica Ljubenkov, Assistant Professor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Credits (ECTS)                          | 6.0 |    |    |    |
| Associate teachers                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Type of instruction (number of hours)   | L   | S  | E  | F  |
|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                         | 30  | 15 | 20 | 10 |
| Status of the course                                                              | Elective                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Percentage of application of e-learning |     |    |    |    |
| COURSE DESCRIPTION                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                         |     |    |    |    |
| Course objectives                                                                 | Students will acquire the basic theoretical and practical knowledge on the production of olives and their processing in olive oil and table olives.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                         |     |    |    |    |
| Course enrolment requirements and entry competences required for the course       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                         |     |    |    |    |
| Learning outcomes expected at the level of the course (4 to 10 learning outcomes) | <p>After passing the exam the student is able to:</p> <ul style="list-style-type: none"><li>- suggest appropriate procedures for planting of olive trees, selection of varieties, fertilization, plant protection, pruning and harvesting,</li><li>- demonstrate the basic steps in making olive oil and table olives production,</li><li>- independently perform basic tests of olive oil and table olives quality evaluation,</li><li>- choose the correct approach in solving the problems with waste materials from olive oil and table olives production,</li><li>- know the basic legislation in the field of olive oil and table olives.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                         |     |    |    |    |
| Course content broken down in detail by weekly class schedule (syllabus)          | <p>1st week: Historic part - olives and olive oil through the history of the Mediterranean region and in Croatia</p> <p>2nd week: Olive production - soil preparation, variety selection, fertilization, pruning, protection and irrigation</p> <p>3rd week: Olive oil production - harvesting, transport, storage, processing methods of olive oil (2 and 3-phase systems), pressing</p> <p>4th week: Filtering, packaging and storage of olive oil, refined olive oil and olive pomace oil</p> <p>5th week: Physico-chemical and sensory analysis of olive oils, introduction to the methods of analysis</p> <p>6th week: Health benefits of olive oil, impact of the individual ingredients</p> <p>7thweek: Legislation in the field of olive oil</p> <p>8th week: Table olives processing, harvesting, transport, storage,</p> <p>9th week: Table olive production (preservation) methods, HACCP</p> <p>10th week: Secondary table olives processing</p> <p>11th week: Evaluation of the table olives quality, introduction to the physico-chemical and sensory testing methods for table olives</p> <p>12th week: Microbiology of olives and olive oil</p> <p>13th week: Legislation in the field of table olives</p> <p>14th week: Waste materials from the production of olive oil and table olives,</p> <p>15th week: Types and quantities of waste from the production of olive oil and table olives, its use and recycling methods</p> <p>Practice: Olive analyses (maturity index, the yield of water and oil), Determination of</p> |                                         |     |    |    |    |

|                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                  |     |               |                                                                                                                                                                                                                                                  |                              |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|--|
|                                                                                                                                                                           | olive oil parameters (free fatty acids, peroxide number, saponification number, iodine number), Table olives preservation methods (brine preparation, debittering, Greek and Spanish way of preserving, "dry" preservation), Brine analyses (pH value, acidity, salt content), visit to olive processing factory and olive oil mills.                                            |     |               |                                                                                                                                                                                                                                                  |                              |  |
| Format of instruction                                                                                                                                                     | <input checked="" type="checkbox"/> lectures<br><input checked="" type="checkbox"/> seminars and workshops<br><input checked="" type="checkbox"/> exercises<br><input type="checkbox"/> <i>on line</i> in entirety<br><input type="checkbox"/> partial e-learning<br><input checked="" type="checkbox"/> field work                                                              |     |               | <input checked="" type="checkbox"/> independent assignments<br><input checked="" type="checkbox"/> multimedia<br><input checked="" type="checkbox"/> laboratory<br><input type="checkbox"/> work with mentor<br><input type="checkbox"/> (other) |                              |  |
| Student responsibilities                                                                                                                                                  | Students are required to attend classes (lectures and seminars 80%, laboratory practice and field work 100%) and actively participate in the teaching process. This will be recorded and evaluated in making a final assessment.                                                                                                                                                 |     |               |                                                                                                                                                                                                                                                  |                              |  |
| Screening student work ( <i>name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course</i> ) | Class attendance                                                                                                                                                                                                                                                                                                                                                                 | 1.0 | Research      |                                                                                                                                                                                                                                                  | Practical training           |  |
|                                                                                                                                                                           | Experimental work                                                                                                                                                                                                                                                                                                                                                                | 1.0 | Report        |                                                                                                                                                                                                                                                  | (Other)                      |  |
|                                                                                                                                                                           | Essay                                                                                                                                                                                                                                                                                                                                                                            |     | Seminar essay |                                                                                                                                                                                                                                                  | (Other)                      |  |
|                                                                                                                                                                           | Tests                                                                                                                                                                                                                                                                                                                                                                            | 1.0 | Oral exam     | 2.0                                                                                                                                                                                                                                              | (Other)                      |  |
|                                                                                                                                                                           | Written exam                                                                                                                                                                                                                                                                                                                                                                     | 1.0 | Project       |                                                                                                                                                                                                                                                  | (Other)                      |  |
| Grading and evaluating student work in class and at the final exam                                                                                                        | The course content is divided into two units that students take over partial exams or joining final exam at the end of the semester. The exam is considered passed if students achieve at least 60%. The final grade is based on the evaluation of partial exams. Grades: <60% not satisfied; 60-70% successful (2) 70-80% good (3), 80-90% very good (4), 90-100% excellent (5) |     |               |                                                                                                                                                                                                                                                  |                              |  |
| Required literature (available in the library and via other media)                                                                                                        | Title                                                                                                                                                                                                                                                                                                                                                                            |     |               | Number of copies in the library                                                                                                                                                                                                                  | Availability via other media |  |
|                                                                                                                                                                           | D. Boskou: Olive Oil-Chemistry and Technology, AOCS press, Champaign, Illinois, 1996.                                                                                                                                                                                                                                                                                            |     |               |                                                                                                                                                                                                                                                  | Yes                          |  |
|                                                                                                                                                                           | B. Zadro, S. Perica (ur.): Maslina i maslinovo ulje A-Ž, Naklada Zadro, Zagreb, 2007.                                                                                                                                                                                                                                                                                            |     |               |                                                                                                                                                                                                                                                  | Yes                          |  |
|                                                                                                                                                                           | O. Koprivnjak: Djevičansko maslinovo ulje: od masline do stola, MIH, Poreč, 2006.                                                                                                                                                                                                                                                                                                |     |               |                                                                                                                                                                                                                                                  | Yes                          |  |
|                                                                                                                                                                           | B. Škarica, I. Žužić, M. Bonifačić: Maslina i maslinovo ulje visoke kakvoće u Hrvatskoj, Vlastita naklada, 1996.                                                                                                                                                                                                                                                                 |     |               |                                                                                                                                                                                                                                                  | Yes                          |  |
|                                                                                                                                                                           | S. Kailis, D. Harris: Producing Table Olives, Landlink Press, Collingwood, 2007.                                                                                                                                                                                                                                                                                                 |     |               |                                                                                                                                                                                                                                                  | Yes                          |  |
|                                                                                                                                                                           | S. Bulimbašić: Proizvodnja maslinovog ulja i konzerviranje masline, Mediteranska poljoprivredna knjiga, 2013.                                                                                                                                                                                                                                                                    |     |               | 2                                                                                                                                                                                                                                                |                              |  |
| Optional literature (at the time of submission of study programme proposal)                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                  |     |               |                                                                                                                                                                                                                                                  |                              |  |
| Quality assurance methods that ensure the acquisition of exit competences                                                                                                 | Quality assurance will be performed at three levels: (1) University Level; (2) Faculty Level by Quality Control Committee; (3) Lecturer's Level.                                                                                                                                                                                                                                 |     |               |                                                                                                                                                                                                                                                  |                              |  |
| Other (as the proposer wishes to                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                  |     |               |                                                                                                                                                                                                                                                  |                              |  |

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## Fruit and Vegetable Processing

| NAME OF THE COURSE                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Fruit and Vegetable Processing          |    |     |    |   |  |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|----|-----|----|---|--|
| Code                                                                              | KTM201                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Year of study                           |    | 2nd |    |   |  |
| Course teacher                                                                    | Ph.D. Tea Bilusic, Full Professor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Credits (ECTS)                          |    | 6.0 |    |   |  |
| Associate teachers                                                                | Ph. D. Danijela Skroza                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Type of instruction (number of hours)   | L  | S   | E  | F |  |
|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                         | 30 | 15  | 25 | 5 |  |
| Status of the course                                                              | Elective                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Percentage of application of e-learning |    |     |    |   |  |
| COURSE DESCRIPTION                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                         |    |     |    |   |  |
| Course objectives                                                                 | Acquiring a basic knowledge on<br>- fruit and vegetable storing and distribution process (control of fruit respiration, maturation, control of fruits quality during distribution)<br>- fruit processing (fruit juices, pectin-based products, dried fruits...)<br>- vegetable processing (canned vegetables, dried vegetables, fermented vegetables...)                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                         |    |     |    |   |  |
| Course enrolment requirements and entry competences required for the course       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                         |    |     |    |   |  |
| Learning outcomes expected at the level of the course (4 to 10 learning outcomes) | After completing the course, the student will become familiarized with the major concepts of fruit and vegetables processing, which includes:<br>- the understanding of biochemical and physiological changes in fruit after maturation process<br>- the knoweldge on nutritive and healthy aspects of fresh fruits and vegetables and their products<br>- the understanding of the influence of paramteres related to fruit shelf-life and quality during storage<br>- the understanding of factors influencing the change of nutritive value and chemical composition of fruit during processing<br>- the knowledge on control systems for food safety in fruit and vegetables processing                                                                                                     |                                         |    |     |    |   |  |
| Course content broken down in detail by weekly class schedule (syllabus)          | 1st week: Fruit and vegetables classification. Healthy and nutritive aspects of fruit and vegetables.<br>2nd week: The influence of maturation process on chemical composition and nutritive value of fruit.<br>3rd week: Biologically active compounds from fruit and vegetables and their role in fruit and vegetable processing.<br>4th week: Microbiology of fresh and stored fruit and vegetable.<br>5th week: Physico-chemical changes in fruit during storage.<br>6th week: Post-harvest technology of fruit and vegetable.<br>7th week: Thermic treatments in fruit and vegetable processing.<br>8th week: Enhancement of nutritive value of fruits and vegetables after thermic treatments.<br>9th week: Fruits and vegetables juices processing.<br>10th week: Pectin-based products. |                                         |    |     |    |   |  |



|                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |     |               |                                                                                                                                                                                                                                       |                                 |                              |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|------------------------------|
|                                                                                                                                                                  | 11th week: Canned and fermented vegetables.<br>12th week: Dried fruits and vegetables.<br>13th week: Minimally processed fruits and vegetables.<br>14th week: Novel technologies in fruits and vegetables processing: vacuum technology, edible coating films, the use of high pressure, new modified atmosphere technology, the use of biotechnology in fruits and vegetables processing.<br>15th week: Fruits and vegetables and their products characteristic for Dalmatian region.<br>Laboratory exercises:<br>Determination of physical and chemical parameters, the amount of pigments (carotenoids, anthocyanins) and biologically active compounds (total phenols, flavonoids) in fruits and vegetables after thermic treatments (blanching, cooking under high temperature). Monitoring of physical and chemical parameters (water amount, amount of reducing sugars, pH, acidity) in fruits and vegetables during maturation process (climacteric and non-climacteric fruits). Determination of carotenoids content in fruits during maturation period. Pulpes of fruits preparation. Fruits juices processing. Fruits clarification. Vegetables juices processing. Preparation of fruit compotes. Preparation of minimally processed fruits and vegetables. Fermented vegetables (sauerkraut). Pectin-based products preparation: jam, jellies. Dried fruits and vegetables preparation. |     |               |                                                                                                                                                                                                                                       |                                 |                              |
| Format of instruction                                                                                                                                            | <input checked="" type="checkbox"/> lectures<br><input checked="" type="checkbox"/> seminars and workshops<br><input type="checkbox"/> exercises<br><input type="checkbox"/> on line in entirety<br><input type="checkbox"/> partial e-learning<br><input type="checkbox"/> field work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |     |               | <input type="checkbox"/> independent assignments<br><input checked="" type="checkbox"/> multimedia<br><input checked="" type="checkbox"/> laboratory<br><input type="checkbox"/> work with mentor<br><input type="checkbox"/> (other) |                                 |                              |
| Student responsibilities                                                                                                                                         | Lectures attendance - at least 70% of full schedule; attendance on seminar work – at least 80% of full schedule. To design the seminar work on selected topic                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |               |                                                                                                                                                                                                                                       |                                 |                              |
| Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course) | Class attendance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1   | Research      |                                                                                                                                                                                                                                       | Practical training              |                              |
|                                                                                                                                                                  | Experimental work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     | Report        |                                                                                                                                                                                                                                       | (Other)                         |                              |
|                                                                                                                                                                  | Essay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     | Seminar essay | 0.5                                                                                                                                                                                                                                   | (Other)                         |                              |
|                                                                                                                                                                  | Tests                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.5 | Oral exam     | 2                                                                                                                                                                                                                                     | (Other)                         |                              |
|                                                                                                                                                                  | Written exam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     | Project       |                                                                                                                                                                                                                                       | (Other)                         |                              |
| Grading and evaluating student work in class and at the final exam                                                                                               | During semester, two written exams are provided (as partial examinations). Test will be carried out within 60 minutes. Students who obtain positive mark from both exams, will have oral examination in order to obtain the final mark. During semester, students should present their seminar work on selected topic within this course. The final mark of this course will count the mark from seminar work, marks from written exams, and mark from oral exams.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |               |                                                                                                                                                                                                                                       |                                 |                              |
| Required literature (available in the library and via other media)                                                                                               | Title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |               |                                                                                                                                                                                                                                       | Number of copies in the library | Availability via other media |
|                                                                                                                                                                  | L. De la Rosa, E. Alvarez-Parilla, G. Gonzalez-Aguilar: Fruit and Vegetable Phytochemicals, Wiley-Blackwell, 2010                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |               |                                                                                                                                                                                                                                       |                                 | x                            |
|                                                                                                                                                                  | W. Jongen: Fruit and Vegetable Processing-Improving Quality, CRC, 2002                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |     |               |                                                                                                                                                                                                                                       |                                 | x                            |
|                                                                                                                                                                  | Y.H. Hui et al. Handbook of Fruits and Fruit Processing, Blackwell Publishing, 2006                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |               |                                                                                                                                                                                                                                       |                                 | x                            |
|                                                                                                                                                                  | N.K. Sinha et al. Handbook of Vegetables and Vegetable Processing, Blackwell, 2005                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |               |                                                                                                                                                                                                                                       |                                 |                              |

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|-----------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------|
|                                                                             | V. Katalinić, I. Generalić, D. Skroza: Tehnologija mediteranskog voća i povrća, skripta za laboratorijske vježbe, KTF, 2010.                                                    |  | KTF web page |
| Optional literature (at the time of submission of study programme proposal) | P.R. Ashurst: Chemistry and Technology of Soft Drinks and Fruit Juices, Blackwell, 2005.<br>W.V. Cruess: Laboratory Manual of Fruit and Vegetable Products, General Book, 2010. |  |              |
| Quality assurance methods that ensure the acquisition of exit competences   | Quality assurance will be performed at three levels: (1) University Level; (2) Faculty Level by Quality Control Committee; (3) Lecturer's Level.                                |  |              |
| Other (as the proposer wishes to add)                                       |                                                                                                                                                                                 |  |              |

## Seafood Processing Technology

| NAME OF THE COURSE                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Seafood Processing Technology              |     |    |    |    |  |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-----|----|----|----|--|
| Code                                                                              | KTM202                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Year of study                              | 2nd |    |    |    |  |
| Course teacher                                                                    | Ph. D. Vida Šimat,<br>Assistant Professor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Credits (ECTS)                             | 6.0 |    |    |    |  |
| Associate teachers                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Type of instruction<br>(number of hours)   | L   | S  | E  | F  |  |
|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                            | 30  | 15 | 20 | 10 |  |
| Status of the course                                                              | Elective                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Percentage of<br>application of e-learning |     |    |    |    |  |
| COURSE DESCRIPTION                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                            |     |    |    |    |  |
| Course objectives                                                                 | The main objectives of this course are to enable students to understand and implement good practices in seafood handling processes by understanding the principle” from catch to fork”; selection of appropriate methods of conservation and implementation of good manufacturing practice during the different seafood processing technologies.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                            |     |    |    |    |  |
| Course enrolment requirements and entry competences required for the course       | Competence in applying knowledge of inorganic and organic chemistry and microbiology and biochemistry.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                            |     |    |    |    |  |
| Learning outcomes expected at the level of the course (4 to 10 learning outcomes) | After passing the exam, the students will be able to:<br>- identify all phases of post mortal changes in fish meat;<br>- identify and analyze metabolites of specific spoilage microorganisms<br>- implement different methods of preservation of fishery products in accordance with good manufacturing practice;<br>- define and implement the necessary methods of assessing the quality of raw material, technological processes and final products of fish processing industry.<br>- calculate the norms/yields necessary for the organization of production in the fish processing industry<br>- identify and eliminate problems in the technological processes<br>- identify critical control points in the production processes, carry out hazard analysis for different technologies and preventive and corrective measures to ensure food safety<br>- Independently implement HACCP plan. |                                            |     |    |    |    |  |

|                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |         |                                                                                                                                                                                                                                                  |         |                    |     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|--------------------|-----|
| Course content broken down in detail by weekly class schedule (syllabus)                                                                                         | 1st week: Introductory lecture, condition and trends in marine fisheries<br>2nd week: Structure and composition of fish<br>3rd week: Post mortal changes in fish<br>4th week: Ice in fisheries<br>5th week: Handling catch on fishing boat<br>6th week: Methods of transport and preparation of raw materials for processing<br>1st colloquium<br>7th week: Preservation of fish using low temperatures<br>8th week: Preservation of fish using high temperatures<br>9th week: Sterilization: production of canned fish<br>10th week: Preservation of fish by salting and marinating<br>11th week: Preservation of fish by smoking and drying<br>12th week: Preservation of fish eggs, invertebrates and algae<br>13th week: Packaging materials and packaging methods in seafood industry<br>2nd. colloquium<br>14th week: Production control, quality management and traceability in the fish processing industry<br>15th week: Examples of implementation of HACCP plans in the fish processing industry, legislation.<br>Exercises:<br>Calculation of yields in seafood production. Control of raw materials, introduction to freshness assessment methods used for fish and crabs. The sensory evaluation of seafood. Histamine, histamine poisoning in humans and comparison of methods for histamine analysis. Measuring the pH, dielectric properties and texture of different types of fish during storage in different storage conditions. Rating various market bought seafood products. Implementation of HACCP plan.<br>Field work:<br>Visiting fish processing plant-Conex Trade doo., Čaprice. Exercise in the laboratory: Control of the shutter, hermeticity and safety of cans during production.<br>Visiting fish processing plant Sardina doo., Postira, Brac,<br>Visiting fish smokehouse Bek doo, Kaštela. |         |                                                                                                                                                                                                                                                  |         |                    |     |
| Format of instruction                                                                                                                                            | <input checked="" type="checkbox"/> lectures<br><input type="checkbox"/> seminars and workshops<br><input checked="" type="checkbox"/> exercises<br><input type="checkbox"/> on line in entirety<br><input type="checkbox"/> partial e-learning<br><input checked="" type="checkbox"/> field work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |         | <input checked="" type="checkbox"/> independent assignments<br><input checked="" type="checkbox"/> multimedia<br><input checked="" type="checkbox"/> laboratory<br><input type="checkbox"/> work with mentor<br><input type="checkbox"/> (other) |         |                    |     |
| Student responsibilities                                                                                                                                         | Students are required to attend classes (lectures and exercises), actively participate in the teaching process and pass the exam (or 2 tests). The presence at lectures will be recorded, and absence needs to be justified. One hundred percent presence in class will be rewarded with 2 extra points at the test.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |         |                                                                                                                                                                                                                                                  |         |                    |     |
| Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course) | Class attendance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1.0     | Research                                                                                                                                                                                                                                         |         | Practical training | 1.0 |
|                                                                                                                                                                  | Experimental work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |         | Report                                                                                                                                                                                                                                           |         | (Other)            |     |
|                                                                                                                                                                  | Essay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |         | Seminar essay                                                                                                                                                                                                                                    | 2.0     | (Other)            |     |
|                                                                                                                                                                  | Tests                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2.0*    | Oral exam                                                                                                                                                                                                                                        | (1.0)** | (Other)            |     |
|                                                                                                                                                                  | Written exam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | (1.0)** | Project                                                                                                                                                                                                                                          |         | (Other)            |     |
| Grading and evaluating student work in class and at the final exam                                                                                               | Continuous evaluation through two tests during the semester (*):<br>Class attendance, A <sub>1</sub> (success 80 = -100%), proportion in final grade, k <sub>1</sub> = 0.1<br>Laboratory and field exercises, A <sub>2</sub> (success = 60 -100%), proportion in final grade, k <sub>2</sub> = 0.15<br>Seminar + presentation, A <sub>3</sub> (success 60 -100%), proportion in final grade, k <sub>3</sub> = 0.15<br>I. test, A <sub>4</sub> (success 60-100 %), proportion in final grade, k <sub>4</sub> = 0.30; II. test, A <sub>5</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |         |                                                                                                                                                                                                                                                  |         |                    |     |

|                                                                             | (success 60 -100%), proportion in final grade, $k_5 = 0.30$<br>$\text{Final grade (\%)} = 0,10A_1 + 0,15A_2 + 0,15A_3 + 0,30A_4 + 0,30A_5$<br>Final evaluation through comprehensive written and oral exams (**) is carried out at regular examination periods through four examination terms. Activities $A_1$ , $A_2$ and $A_3$ are measured in the same manner as above. Written exam, $A_6$ (success 60 -100%), the proportion of evaluation, $k_6 = 0.20$ ; Oral examination, $A_7$ (success 60 -100%), the share of the assessment, $k_7 = 0.40$<br>$\text{Final grade (\%)} = 0,10A_1 + 0,15A_2 + 0,15A_3 + 0,20A_6 + 0,40A_7$ (50 -64% - sufficient (2); 65-75% - good (3); 76-89% - very good (4); 89-100% - excellent (5).<br>If the student has passed only one test (*) during continuous evaluation he/she is required to take the comprehensive exam (**) in the regular examination periods and the passed test will be acknowledged by the end of the academic year as part of a written exam. |                                 |                              |
|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|------------------------------|
| Required literature (available in the library and via other media)          | Title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Number of copies in the library | Availability via other media |
|                                                                             | B. Šoša: Higijena i tehnologija prerade morske ribe, ŠK, Zagreb, 1989.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                 | Yes                          |
|                                                                             | Z. E. Sikorski: Seafood: resources, nutritional composition and preservation, CRC Press, Inc. Boca Raton, Florida, SAD, 1990.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                 | Yes                          |
|                                                                             | T. Borresen: Improving seafood products for the consumer, Woodhead Publishing Ltd., Cambridge, England, 2008.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                 | Yes                          |
|                                                                             | H. Rehbein, J. Oehlenschläger: Fishery Products: Quality, safety and authenticity. Wiley-Blackwell, UK, 2009.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                 | Yes                          |
|                                                                             | H. A. Bremner: Safety and quality issues in fish processing, CRC Press, Inc. Boca Raton, Florida, SAD, 2002.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                 | Yes                          |
| Optional literature (at the time of submission of study programme proposal) | J. B. Luten, T. Borresen, J. Oehlenschläger: Seafood from producer to consumer. Integrated approach to quality. Elsevier, Amsterdam, 1997.<br>H. H. Huss: Fresh fish- quality and quality changes, Training Programme on Fish Technology and Quality Control, FAO Fisheries Series, FAO, Rome, 1988.<br>H. H. Huss: Assurance of Seafood Quality. FAO Fisheries Technical Paper No. 334., FAO, Rome, Italy, 1994.<br>H. H. Huss: Quality and quality changes in fresh fish. FAO Fisheries Technical Paper No. 348., FAO, Rome, Italy, 1995.<br>EU legislation                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                 |                              |
| Quality assurance methods that ensure the acquisition of exit competences   | Quality assurance will be performed at three levels: (1) University Level; (2) Faculty Level by Quality Control Committee; (3) Lecturer's Level.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                 |                              |
| Other (as the proposer wishes to add)                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                 |                              |

## Processing Technology of Species and Medicinal Herbs

| NAME OF THE COURSE |        | Processing Technology of Species and Medicinal Herbs |     |
|--------------------|--------|------------------------------------------------------|-----|
| Code               | KTM203 | Year of study                                        | 2nd |

|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                         |     |    |    |   |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|----|----|---|
| Course teacher                                                                    | Ph. D. Igor Jerković, Full Professor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Credits (ECTS)                          | 6.0 |    |    |   |
| Associate teachers                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Type of instruction (number of hours)   | L   | S  | E  | F |
|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                         | 30  | 15 | 30 | 0 |
| Status of the course                                                              | Elective                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Percentage of application of e-learning |     |    |    |   |
| COURSE DESCRIPTION                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                         |     |    |    |   |
| Course objectives                                                                 | Students will know and understand the most important techniques in the processing of medicinal herbs and spices. They will acquire basic knowledge of plant families and species that are commonly used in the food industry and the main methods of preparing herbal preparations (teas and tea blends, spice powders, herbal extracts, concentrates).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                         |     |    |    |   |
| Course enrolment requirements and entry competences required for the course       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                         |     |    |    |   |
| Learning outcomes expected at the level of the course (4 to 10 learning outcomes) | <p>After passing the exam students will be able to:</p> <ul style="list-style-type: none"><li>- describe basic terms, types of species and medicinal herbs, preparation of extracts and their useful application</li><li>- demonstrate basic procedures of processing species and medicinal plants and extraction methods</li><li>- determine appropriate analysis methods of the obtained extracts or plant materials and methods of determination of antioxidant and antibacterial properties</li><li>- suggest appropriate procedures of processing of species and medicinal plants considering basic postulates of extraction, analysis of extracts considering artefacts formation and impact to composition and properties of the product</li><li>- select appropriate approach in solving the problems in the area of processing of species and medicinal herbs, starting from knowledge from chemistry, technology and biotechnology</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                         |     |    |    |   |
| Course content broken down in detail by weekly class schedule (syllabus)          | <p>1st week: Introduction, history and use of medicinal herbs; Definition of medicinal herbs and aromatic plants,<br/>2nd week: Taxonomy, nomenclature and classification; Distribution in Croatia and abroad; Wild and cultivated plants; Potential of the Mediterranean climate.<br/>3rd week: Selected species of medicinal plants and herbs and their importance in the food industry,<br/>4th week: Representatives of some major plant families (legumes, daisies, cloves, roses, anemones, lilies, wheat or grass, meadow grass).<br/>5th week: Production steps: Select and Collection / Harvesting (seeds, leaves, roots),<br/>6th week: Transportation, Quality of raw material (the determination of pesticides, mycotoxins, microbiological...);<br/>7th week: Mulching; Drying (chamber and tunnel dryers, microwave drying, spray freeze and reverse osmosis),<br/>8th week: Cleaning, packaging and labeling products; Preservation.<br/>9th week: Herbal preparations (liquid and dry extracts), liquid extract (the degree of fragmentation, extraction tool, extraction);<br/>10th week: First group of extraction methods (maceration, bimbaceration, digestion, infusion, decoction, turboextraction, ultrasonic extraction);<br/>11th week: Second group of methods of extraction (percolation, repercolation, diacolation, evacolation).<br/>12th week: Active and effective substances, antioxidant and antimicrobial properties of biologically active compounds from herbs and aromatic plants,<br/>13th week: Analysis of plant material; Factors affecting the quality of active ingredients.<br/>14th week: The most important products, teas and tea blends, spice powders, spice</p> |                                         |     |    |    |   |

|                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                   |     |               |                                                                                                                                                                                                                                                  |                              |     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-----|
|                                                                                                                                                                  | extracts and concentrates, legal restrictions.                                                                                                                                                                                                                                                    |     |               |                                                                                                                                                                                                                                                  |                              |     |
| Format of instruction                                                                                                                                            | <input checked="" type="checkbox"/> lectures<br><input checked="" type="checkbox"/> seminars and workshops<br><input checked="" type="checkbox"/> exercises<br><input type="checkbox"/> on line in entirety<br><input type="checkbox"/> partial e-learning<br><input type="checkbox"/> field work |     |               | <input checked="" type="checkbox"/> independent assignments<br><input checked="" type="checkbox"/> multimedia<br><input checked="" type="checkbox"/> laboratory<br><input type="checkbox"/> work with mentor<br><input type="checkbox"/> (other) |                              |     |
| Student responsibilities                                                                                                                                         |                                                                                                                                                                                                                                                                                                   |     |               |                                                                                                                                                                                                                                                  |                              |     |
| Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course) | Class attendance                                                                                                                                                                                                                                                                                  | 2.0 | Research      | 0                                                                                                                                                                                                                                                | Practical training           | 1.0 |
|                                                                                                                                                                  | Experimental work                                                                                                                                                                                                                                                                                 | 1.0 | Report        | 0                                                                                                                                                                                                                                                | (Other)                      |     |
|                                                                                                                                                                  | Essay                                                                                                                                                                                                                                                                                             | 0   | Seminar essay | 0.5                                                                                                                                                                                                                                              | (Other)                      |     |
|                                                                                                                                                                  | Tests                                                                                                                                                                                                                                                                                             | 0   | Oral exam     | 0                                                                                                                                                                                                                                                | (Other)                      |     |
|                                                                                                                                                                  | Written exam                                                                                                                                                                                                                                                                                      | 1.0 | Project       | 0                                                                                                                                                                                                                                                | (Other)                      |     |
| Grading and evaluating student work in class and at the final exam                                                                                               | Presence and activities on lectures and seminars: 5%<br>Laboratory exercises: 10%<br>First partial exam: 43%<br>Second partial exam: 42%                                                                                                                                                          |     |               |                                                                                                                                                                                                                                                  |                              |     |
| Required literature (available in the library and via other media)                                                                                               | Title                                                                                                                                                                                                                                                                                             |     |               | Number of copies in the library                                                                                                                                                                                                                  | Availability via other media |     |
|                                                                                                                                                                  | S.S. Handa, S.P.S. Khanuja, G. Longo, D.D. Rakesh, Extraction Technologies for Medicinal and Aromatic Plants. International Centre for Science and High Technology, Trieste, 2008                                                                                                                 |     |               | 1                                                                                                                                                                                                                                                | No                           |     |
|                                                                                                                                                                  | I. Jerković, Kemija aroma, Kemijsko-tehnološki fakultet u Splitu, 2011.                                                                                                                                                                                                                           |     |               | 1                                                                                                                                                                                                                                                | Yes                          |     |
|                                                                                                                                                                  | K. V. Peter, Handbook of Herbs and Spices, Volumen 2, CRC Press, 2006.                                                                                                                                                                                                                            |     |               | 1                                                                                                                                                                                                                                                | No                           |     |
|                                                                                                                                                                  | K.T. Galle, Hrvatsko ljekovito bilje, Mozaik knjiga, Zagreb, 2001.                                                                                                                                                                                                                                |     |               | 1                                                                                                                                                                                                                                                | No                           |     |
|                                                                                                                                                                  | M. Maffei, Dietary Supplements of Plant Origin: A Nutrition and Health Approach, Taylor & Francis, London, UK, 2003.                                                                                                                                                                              |     |               | 1                                                                                                                                                                                                                                                | No                           |     |
| Optional literature (at the time of submission of study programme proposal)                                                                                      | Herbs, spices and essential oils: Post-harvest operations in developing countries, UNIDO and FAO 2005.                                                                                                                                                                                            |     |               |                                                                                                                                                                                                                                                  |                              |     |
| Quality assurance methods that ensure the acquisition of exit competences                                                                                        | Quality assurance will be performed at three levels: (1) University Level; (2) Faculty Level by Quality Control Committee; (3) Lecturer's Level.                                                                                                                                                  |     |               |                                                                                                                                                                                                                                                  |                              |     |
| Other (as the proposer wishes to add)                                                                                                                            |                                                                                                                                                                                                                                                                                                   |     |               |                                                                                                                                                                                                                                                  |                              |     |



## Alcoholic Beverages Technology

| NAME OF THE COURSE                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Alcoholic Beverages Technology          |     |   |    |    |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|---|----|----|
| Code                                                                              | KTM204                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Year of study                           | 2nd |   |    |    |
| Course teacher                                                                    | Ph. D. Ivana Generalić Mekinić, Assistant Professor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Credits (ECTS)                          | 6.0 |   |    |    |
| Associate teachers                                                                | Ph. D. Irena Budić-Leto, Assistant Professor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Type of instruction (number of hours)   | L   | S | E  | F  |
|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                         | 30  | 0 | 15 | 15 |
| Status of the course                                                              | Elective                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Percentage of application of e-learning |     |   |    |    |
| COURSE DESCRIPTION                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                         |     |   |    |    |
| Course objectives                                                                 | The aim of the course is to teach students about basic concepts and technologies used in the production of alcoholic beverages, explain them the differences in the types of alcoholic beverages based on the used raw material and production method, and to transfer them the knowledge necessary for planning and managing the technological process of alcoholic beverages production.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                         |     |   |    |    |
| Course enrolment requirements and entry competences required for the course       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                         |     |   |    |    |
| Learning outcomes expected at the level of the course (4 to 10 learning outcomes) | <p>Students will on successful completion of the course be able to:</p> <ul style="list-style-type: none"> <li>- define and group alchocolic beverages based on the origin of raw materials and applied production technology,</li> <li>- prepare the basic raw material for the production of alcoholic beverages,</li> <li>- describe the basic steps in the manufacturing process for different beverages,</li> <li>- define basic chemical, physical and sensory parametres used in quality testing of alcoholic beverages,</li> <li>- apply the knowledge in the production process.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                         |     |   |    |    |
| Course content broken down in detail by weekly class schedule (syllabus)          | <p>1st week: History and development of alcoholic beverage production; Processing technologies, Types and classification of alcholic beverages according to the raw material and processing method</p> <p>2nd week: Raw materials and basic components for alcoholic beverage production (fruits, wine and wine-processing byproducts, raw material quality control...)</p> <p>3rd week: Primary processing</p> <p>4th week: Fermentation- chemical and biochemical changes, yeasts, alcoholic fermentation, products and by-products</p> <p>5th week: Distillation - the basic principles and principles, dynamics and chemical changes during distillation</p> <p>6th week: Distilation equipment</p> <p>7th week: Distillate finishing (ripening, strenght correction, dilution, filtering ...)</p> <p>8th week: Maturation and treatment of alcoholic beverages</p> <p>9th week: Defects of alcoholic beverages</p> <p>I Colloquium</p> <p>10th week: Processing and production of alcoholic beverages</p> <p>11th week: Brandy production</p> <p>12th week: Production of distilled beverages from grapes, wine and fermented mash, production of grain brandy</p> <p>13th week: Production of brandy with accessories, Liquer production</p> <p>14th week: Traditional Croatian alcoholic beverages;</p> <p>15th week: Quality of alcoholic beverages and its evaluation, legislation,</p> <p>II. colloquium</p> <p>Exercises:</p> |                                         |     |   |    |    |



|                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |               |                                                                                                                                                                                                                                                  |                              |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|--|
|                                                                                                                                                                           | Production and analysis of selected alcoholic beverage:<br>- determining the basic characteristics of the raw material, preparation and pre-treatment of mash, fermentation<br>- distillation of the fermented pomace, calculation of the potential alcohol, distillate strength measuring and distillate dilution to a defined volume, the addition of other ingredients<br>- determination of the alcohol content, production of natural colors<br>- physico-chemical methods for the determination of selected compounds in alcoholic beverages (sugar, free organic acid, flavoring agents, etc.)<br>- identification of the presence of some particular substances in alcoholic beverages (hydrogen cyanide, copper, artificial colors, etc.).<br>- sensory evaluation of alcoholic beverages<br>- field work - student visits to selected facilities for the production of alcoholic beverages. |     |               |                                                                                                                                                                                                                                                  |                              |  |
| Format of instruction                                                                                                                                                     | <input checked="" type="checkbox"/> lectures<br><input type="checkbox"/> seminars and workshops<br><input type="checkbox"/> exercises<br><input type="checkbox"/> <i>on line</i> in entirety<br><input type="checkbox"/> partial e-learning<br><input type="checkbox"/> field work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |               | <input checked="" type="checkbox"/> independent assignments<br><input checked="" type="checkbox"/> multimedia<br><input checked="" type="checkbox"/> laboratory<br><input type="checkbox"/> work with mentor<br><input type="checkbox"/> (other) |                              |  |
| Student responsibilities                                                                                                                                                  | Active participation in all activities: lectures, consultations, searching the literature.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |               |                                                                                                                                                                                                                                                  |                              |  |
| Screening student work ( <i>name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course</i> ) | Class attendance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1.0 | Research      |                                                                                                                                                                                                                                                  | Practical training           |  |
|                                                                                                                                                                           | Experimental work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1.0 | Report        |                                                                                                                                                                                                                                                  | (Other)                      |  |
|                                                                                                                                                                           | Essay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     | Seminar essay | 2.0                                                                                                                                                                                                                                              | (Other)                      |  |
|                                                                                                                                                                           | Tests                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1.0 | Oral exam     |                                                                                                                                                                                                                                                  | (Other)                      |  |
|                                                                                                                                                                           | Written exam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1.0 | Project       |                                                                                                                                                                                                                                                  | (Other)                      |  |
| Grading and evaluating student work in class and at the final exam                                                                                                        | The final grade is based on the evaluation of partial exams and laboratory exercises.<br>Scoring: <60% insufficient; 60-70% sufficient (2); 70-80% good (3); 80-90% very good (4); 90-100% excellent (5).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |               |                                                                                                                                                                                                                                                  |                              |  |
| Required literature (available in the library and via other media)                                                                                                        | Title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |               | Number of copies in the library                                                                                                                                                                                                                  | Availability via other media |  |
|                                                                                                                                                                           | I. Mujić: Tehnologija proizvodnje jakih alkoholnih pića, Veleučilišni udžbenik, Agrohit PZ, Bjelovar, 2010.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |               |                                                                                                                                                                                                                                                  | Yes                          |  |
|                                                                                                                                                                           | E. Keršek: Ljekovite biljne i voćne rakije: Rakijska biljaruša, VBZ, 2008.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |               |                                                                                                                                                                                                                                                  | Yes                          |  |
|                                                                                                                                                                           | N. Nikićević, V. Tešević: Proizvodnja voćnih rakija vrhunskog kvaliteta, Poljoprivredni fakultet Univerzitet u Beogradu, NIK-Press, 2010.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |               |                                                                                                                                                                                                                                                  | Yes                          |  |
|                                                                                                                                                                           | J. H. Bryce, G. G. Steward: Distilled Spirits: Tradition and Innovation, Nottingham University Press, UK, 2005.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |               |                                                                                                                                                                                                                                                  | Web                          |  |
| Optional literature (at the time of submission of study programme proposal)                                                                                               | Selected scientific papers.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |               |                                                                                                                                                                                                                                                  |                              |  |
| Quality assurance methods that                                                                                                                                            | Quality assurance will be performed at three levels: (1) University Level; (2) Faculty Level by Quality Control Committee; (3) Lecturer's Level.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     |               |                                                                                                                                                                                                                                                  |                              |  |

|                                            |  |
|--------------------------------------------|--|
| ensure the acquisition of exit competences |  |
| Other (as the proposer wishes to add)      |  |

## Technology of Meat and Meat Products

| NAME OF THE COURSE                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Technology of Meat and Meat Products    |    |     |    |   |  |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|----|-----|----|---|--|
| Code                                                                              | KTM205                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Year of study                           |    | 2nd |    |   |  |
| Course teacher                                                                    | Ph. D. Mladenka Malenica Staver, Assistant Professor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Credits (ECTS)                          |    | 6.0 |    |   |  |
| Associate teachers                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Type of instruction (number of hours)   | L  | S   | E  | F |  |
|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                         | 30 | 15  | 30 | 0 |  |
| Status of the course                                                              | Elective                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Percentage of application of e-learning |    |     |    |   |  |
| COURSE DESCRIPTION                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                         |    |     |    |   |  |
| Course objectives                                                                 | The course enables students to understand the morphology of muscle, metabolic processes in meat and provides practical knowledge of the ways of preserving meat. Students are trained to understand the technology of meat processing and organization of the process in meat industry.                                                                                                                                                                                                                                                                                                                                                                                    |                                         |    |     |    |   |  |
| Course enrolment requirements and entry competences required for the course       | Passed the course of Biochemistry.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                         |    |     |    |   |  |
| Learning outcomes expected at the level of the course (4 to 10 learning outcomes) | Students will be able to:<br>- define meat<br>- explain the chemical composition and structure of meat<br>- describe the maturation of meat<br>- determine the relationship between the morphology of muscles, basic metabolic processes and visible indicators of the quality of meat<br>- explain the deterioration of meat<br>- explain the methods of preserving meat<br>- understand the application of technological processes in the meat industry<br>- enumerate meat products and explain the related category products<br>- explain the quality control, safety and sanitation                                                                                   |                                         |    |     |    |   |  |
| Course content broken down in detail by weekly class schedule (syllabus)          | 1st week: The history of the production of meat and meat products,<br>2nd week: categorization and classification of carcasses and meat<br>3rd week: Nutritional value of meat, morphology of the muscle, basic metabolic processes in the flesh <i>post-mortem</i> .<br>4th week: Factors affecting meat quality<br>5th week: Types of meat products based on raw materials and the production method<br>6th week: The technology and preservation in meat industry (canning, salting, drying, smoking and sealing in a can)<br>7th week: Meat processing equipment<br>8th week: Production of cooked and semi-dry sausages, sausages for cooking and sausages for baking |                                         |    |     |    |   |  |

|                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |               |                                                                                                                                                                                                                 |                              |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|--|
|                                                                                                                                                                  | 9th week: Fermentation of sausages<br>10th week: Ripening of meat<br>1. Test<br>11th week: Labeling of meat and meat products<br>12th week: Regulation concerning meat and meat products<br>13th week: Analysis of meat technology through the visit to meat industry<br>14th week: Analysis of technological processes in visited meat industry<br>15th week: View of technological processes in the visited meat industry<br>2. Test |     |               |                                                                                                                                                                                                                 |                              |  |
| Format of instruction                                                                                                                                            | <input checked="" type="checkbox"/> lectures<br><input checked="" type="checkbox"/> seminars and workshops<br><input type="checkbox"/> exercises<br><input type="checkbox"/> <i>on line</i> in entirety<br><input type="checkbox"/> partial e-learning<br><input checked="" type="checkbox"/> field work                                                                                                                               |     |               | <input type="checkbox"/> independent assignments<br><input type="checkbox"/> multimedia<br><input type="checkbox"/> laboratory<br><input type="checkbox"/> work with mentor<br><input type="checkbox"/> (other) |                              |  |
| Student responsibilities                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |               |                                                                                                                                                                                                                 |                              |  |
| Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course) | Class attendance                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.5 | Research      |                                                                                                                                                                                                                 | Practical training           |  |
|                                                                                                                                                                  | Experimental work                                                                                                                                                                                                                                                                                                                                                                                                                      |     | Report        | 1.4                                                                                                                                                                                                             | (Other)                      |  |
|                                                                                                                                                                  | Essay                                                                                                                                                                                                                                                                                                                                                                                                                                  |     | Seminar essay |                                                                                                                                                                                                                 | (Other)                      |  |
|                                                                                                                                                                  | Tests                                                                                                                                                                                                                                                                                                                                                                                                                                  | 2.3 | Oral exam     |                                                                                                                                                                                                                 | (Other)                      |  |
|                                                                                                                                                                  | Written exam                                                                                                                                                                                                                                                                                                                                                                                                                           | 1.8 | Project       |                                                                                                                                                                                                                 | (Other)                      |  |
| Grading and evaluating student work in class and at the final exam                                                                                               | Students will be evaluated based on attendance and activity during classes. Knowledge of the concepts and understanding of the technology of meat and meat products will be evaluated through tests and written exam. Understanding the processes in the meat industry will be evaluated through the written seminars based on fieldwork during visits to the meat industry.                                                           |     |               |                                                                                                                                                                                                                 |                              |  |
| Required literature (available in the library and via other media)                                                                                               | Title                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |               | Number of copies in the library                                                                                                                                                                                 | Availability via other media |  |
|                                                                                                                                                                  | J. Živković: Higijena i tehnologija mesa; I. dio, Veterinarsko-sanitarna kontrola životinja za klanje i mesa, II. dio Kakvoća i prerada, Veterinarski fakultet, Liber, Zagreb, 1986.                                                                                                                                                                                                                                                   |     |               |                                                                                                                                                                                                                 |                              |  |
|                                                                                                                                                                  | S. Rahelić: Osnove tehnologije mesa, Školska knjiga, Zagreb, 1985.                                                                                                                                                                                                                                                                                                                                                                     |     |               |                                                                                                                                                                                                                 |                              |  |
|                                                                                                                                                                  | Đ. Roseg: Prerada mesa i mlijeka. Nakladni zavod Globus, Zagreb, 1995.                                                                                                                                                                                                                                                                                                                                                                 |     |               |                                                                                                                                                                                                                 |                              |  |
| Optional literature (at the time of submission of study programme proposal)                                                                                      | W. K. Jensen, C. Dawine, M. Dikeman: Encyclopedia of meat sciences, Vol. 1,2,3. Elsevier Academic Press, UK, 2004.<br>F. Toldrá: Handbook of Meat Processing, Blackwell Publishing, USA, 2010.                                                                                                                                                                                                                                         |     |               |                                                                                                                                                                                                                 |                              |  |
| Quality assurance methods that ensure the acquisition of exit competences                                                                                        | Methods of Quality assurance will be performed at three levels:<br>(1) University; (2) Faculty, Control Committee of quality of teaching; (3) Teacher's level.                                                                                                                                                                                                                                                                         |     |               |                                                                                                                                                                                                                 |                              |  |
| Other (as the proposer wishes to add)                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |               |                                                                                                                                                                                                                 |                              |  |

## Technology of Cereals

| NAME OF THE COURSE                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Technology of Cereals                   |     |   |    |    |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|---|----|----|
| Code                                                                              | KTM206                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Year of study                           | 2nd |   |    |    |
| Course teacher                                                                    | Ph. D. Tea Bilušić, Full Professor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Credits (ECTS)                          | 6.0 |   |    |    |
| Associate teachers                                                                | Ph. D. Danijela Skroza                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Type of instruction (number of hours)   | L   | S | E  | F  |
|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                         | 30  | 0 | 15 | 15 |
| Status of the course                                                              | Elective                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Percentage of application of e-learning |     |   |    |    |
| COURSE DESCRIPTION                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                         |     |   |    |    |
| Course objectives                                                                 | The aim of the course is to introduce the students with technological processes in the manufacture of bakery products, as well as with physical, chemical and nutritional properties of raw materials and final products. The knowledge that students acquire in this course will enable them to independently solve engineering problems related to the production of cereals and other bakery products.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                         |     |   |    |    |
| Course enrolment requirements and entry competences required for the course       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                         |     |   |    |    |
| Learning outcomes expected at the level of the course (4 to 10 learning outcomes) | After completing the course, students will be able to:<br>- independently analyze the composition of cereals, and know the properties and role of particular constituents, evaluate quality parameters of milled products,<br>- explain the changes that occur during the cereals processing,<br>- have knowledge for indepent selection of raw materials for the production of certain products as well for new product development,<br>- analyze and explain the changes that occur during the processing<br>- organize the work and independently conduct the production of bakery products, pastas and others products from cereals,<br>- implement the legal framework, using scientific and professional literature for the purpose of lifelong learning.                                                                                                                                                                                                                                                                                                  |                                         |     |   |    |    |
| Course content broken down in detail by weekly class schedule (syllabus)          | 1st week: Cereals (origin, classification, appearance, composition, nutritional value);<br>2nd week: Legislation; The importance of whole grains in the human diet<br>3rd week: Proteins, lipids and enzymes in the grains (structures, properties and role)<br>4th week: Wheat<br>5th week: Other cereals: Rice, Oat, Rye, Barley, Millet, Corn<br>6th week: Technology of the flour production and processing<br>7th week: Industrial milling, classification of grains, processing devices, flour chemical composition<br>I colloquium<br>8th week: Yeast in baking process (dough fermentation)<br>9th week: Other additives in baking (adjuvants, flavorings, additives, etc.)<br>10th week: Bread-baking tehnology (raw materials, production processes and steps, packaging, storage etc.)<br>11th week: The production of toast, biscuits and flat bread;<br>12th week: The production of cookies, wafels, crackers and sweets<br>13th week: The production of puff pastry (machinery, conditions, freezing)<br>14th week: The production of fresh pasta |                                         |     |   |    |    |

|                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |               |                                                                                                                                                                                                                                                  |                                 |                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|------------------------------|
|                                                                                                                                                                           | 15th week: The production of other pasta products; Legislation<br>II. colloquium<br>Seminars:<br>Application of legal regulations and standards in baking; Scientific and technical literature search for writing an essay on a selected topic; Development of new products from cereals; Presentation of seminars; Visit to industrial bakery and introduction to technological processes used in industry of baking products<br>Laboratory exercises:<br>Determination of the organoleptic properties of wheat; Production of bread and other flour products; Determination of moisture in cereals and bakery products; Determination of the amount of salt in products of flour; Gluten analysis; Sensory evaluation of bread and other bakery products; Sensory analysis and determination of pasta cooking degree |     |               |                                                                                                                                                                                                                                                  |                                 |                              |
| Format of instruction                                                                                                                                                     | <input checked="" type="checkbox"/> lectures<br><input checked="" type="checkbox"/> seminars and workshops<br><input checked="" type="checkbox"/> exercises<br><input type="checkbox"/> <i>on line</i> in entirety<br><input type="checkbox"/> partial e-learning<br><input checked="" type="checkbox"/> field work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |               | <input checked="" type="checkbox"/> independent assignments<br><input checked="" type="checkbox"/> multimedia<br><input checked="" type="checkbox"/> laboratory<br><input type="checkbox"/> work with mentor<br><input type="checkbox"/> (other) |                                 |                              |
| Student responsibilities                                                                                                                                                  | Active participation in all activities: lectures, consultations, searching the literature.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |               |                                                                                                                                                                                                                                                  |                                 |                              |
| Screening student work ( <i>name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course</i> ) | Class attendance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.5 | Research      |                                                                                                                                                                                                                                                  | Practical training              |                              |
|                                                                                                                                                                           | Experimental work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     | Report        |                                                                                                                                                                                                                                                  | Practice                        | 0.5                          |
|                                                                                                                                                                           | Essay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     | Seminar essay | 1.0                                                                                                                                                                                                                                              | (Other)                         |                              |
|                                                                                                                                                                           | Tests                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 2.0 | Oral exam     | 1.0                                                                                                                                                                                                                                              | (Other)                         |                              |
|                                                                                                                                                                           | Written exam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     | Project       |                                                                                                                                                                                                                                                  | (Other)                         |                              |
| Grading and evaluating student work in class and at the final exam                                                                                                        | The final grade passed pursuant to mark preliminary exams, seminar essay and laboratory exercises.<br>Rating: <60% not sufficient; 60-70% sufficient (2); 70-80% good (3); 80-90% very good (4); 90-100% excellent (5).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |     |               |                                                                                                                                                                                                                                                  |                                 |                              |
| Required literature (available in the library and via other media)                                                                                                        | Title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |               |                                                                                                                                                                                                                                                  | Number of copies in the library | Availability via other media |
|                                                                                                                                                                           | K. A. Rosentrater, A. D. Evers: Kent's Technology of cereals. An Introduction for Students of Food Science and Agriculture. Woodhead Publishing, Elsevier, 2017.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |               |                                                                                                                                                                                                                                                  |                                 | Yes                          |
|                                                                                                                                                                           | K. Kulp, J.G Ponte Jr.: Handbook of Cereal Science and Technology, Second Edition, Revised and Expanded, Marcel Dekker, INC., New York, 2000.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     |               |                                                                                                                                                                                                                                                  |                                 | Yes                          |
|                                                                                                                                                                           | S. P. Cauvain, L. S. Young: Technology of Breadmaking - Second Edition. Springer Science+Business Media, LLC. New York, USA, 2007.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |     |               |                                                                                                                                                                                                                                                  |                                 | Yes                          |
| Optional literature (at the time of submission of study programme proposal)                                                                                               | Y. Liangli: Wheat antioxidants, John Wily & Sons, Inc. Hoboken, New Jersey, 2008.<br>The legislation on food from cereal.<br>Selected scientific papers.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |               |                                                                                                                                                                                                                                                  |                                 |                              |
| Quality assurance methods that ensure the                                                                                                                                 | Quality assurance will be performed at three levels: (1) University Level; (2) Faculty Level by Quality Control Committee; (3) Lecturer's Level.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |               |                                                                                                                                                                                                                                                  |                                 |                              |



|                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |               |                                                                                                                                                                                                                                       |                              |     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-----|
|                                                                                                                                                                | 13th week: Corrosion tests. Standards.<br>14th week: Maintenance of metal surfaces in the food industry (chemical cleaning).<br>15th week: Maintenance of metal surfaces in the food industry (disinfection, sterilization).Second test.<br>Exercises:<br>Monitor atmospheric corrosion. Examination of corrosion rate by polarization methods. Determination of the critical pitting temperature of stainless steel.<br>Examination of corroded metal samples by optical microscopy. Protection of aluminum alloy anodizing and processing of the oxide film. Determination of the effectiveness of organic corrosion inhibitors. Cathodic protection by means of a protector. |     |               |                                                                                                                                                                                                                                       |                              |     |
| Format of instruction                                                                                                                                          | <input checked="" type="checkbox"/> lectures<br><input type="checkbox"/> seminars and workshops<br><input checked="" type="checkbox"/> exercises<br><input type="checkbox"/> <i>on line</i> in entirety<br><input type="checkbox"/> partial e-learning<br><input type="checkbox"/> field work                                                                                                                                                                                                                                                                                                                                                                                   |     |               | <input type="checkbox"/> independent assignments<br><input checked="" type="checkbox"/> multimedia<br><input checked="" type="checkbox"/> laboratory<br><input type="checkbox"/> work with mentor<br><input type="checkbox"/> (other) |                              |     |
| Student responsibilities                                                                                                                                       | Lecture attendance: 80 %. Exercises attendance: 100 %.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     |               |                                                                                                                                                                                                                                       |                              |     |
| Screening student work(name the proportion of ECTS credits for eachactivity so that the total number of ECTS credits is equal to the ECTS value of the course) | Class attendance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.5 | Research      |                                                                                                                                                                                                                                       | Practical training           | 1.0 |
|                                                                                                                                                                | Experimental work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1.0 | Report        |                                                                                                                                                                                                                                       | (Other)                      |     |
|                                                                                                                                                                | Essay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     | Seminar essay |                                                                                                                                                                                                                                       | (Other)                      |     |
|                                                                                                                                                                | Tests                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1.0 | Oral exam     | 1.5                                                                                                                                                                                                                                   | (Other)                      |     |
|                                                                                                                                                                | Written exam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1.0 | Project       |                                                                                                                                                                                                                                       | (Other)                      |     |
| Grading and evaluating student work in class and at the final exam                                                                                             | The entire course can be passed by two partial exams during the semester. Passing threshold is 60%. Each partial exam in assessing participates with 40% and exercises with 20%. On examination shedule students will have oral exam. Scoring: <60% insufficient, 60-70 % - sufficient, 71-80 % - good, 81-92% very good, 93-100% - excellent.                                                                                                                                                                                                                                                                                                                                  |     |               |                                                                                                                                                                                                                                       |                              |     |
| Required literature (available in the library and via other media)                                                                                             | Title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |               | Number of copies in the library                                                                                                                                                                                                       | Availability via other media |     |
|                                                                                                                                                                | E. Stupnišek-Lisac: Korozija i zaštita konstrukcijskih materijala, Fakultet kemijskog inženjerstva i tehnologije Sveučilišta u Zagrebu, Zagreb 2007.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |               | 1                                                                                                                                                                                                                                     |                              |     |
|                                                                                                                                                                | S. Brkić: Priručnik - Nehrdajući čelici u farmaceutskeoj, prehrambenoj i kemijskoj industriji, Hrvatsko društvo za materijale i tribologiju, Zagreb, 2007.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     |               | 1                                                                                                                                                                                                                                     |                              |     |
|                                                                                                                                                                | B. Jarić, A. Rešetić: Korozija i katodna zaštita, Korexpres, Zagreb, 2003.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     |               | 1                                                                                                                                                                                                                                     |                              |     |
|                                                                                                                                                                | I. Esih, Z. Dugi: Tehnologija zaštite od korozije I, Školska knjiga, Zagreb, 1990.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |     |               | 1                                                                                                                                                                                                                                     |                              |     |
| Optional literature                                                                                                                                            | M. Gojić: Površinska obradba materijala, Metalurški fakultet, Zagreb, 2010.<br>P. Marcus: Corrosion mechanisms in theory and practice, Marcel Dekker Inc. USA 2002.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |               |                                                                                                                                                                                                                                       |                              |     |
| Quality assurance methods that ensure the acquisition of exit competences                                                                                      | Quality assurance will be performed at three levels: (1) University Level; (2) Faculty Level by Quality Control Committee; (3) Lecturer's Level.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |     |               |                                                                                                                                                                                                                                       |                              |     |
| Other (as the                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |               |                                                                                                                                                                                                                                       |                              |     |



|                         |  |
|-------------------------|--|
| proposer wishes to add) |  |
|-------------------------|--|

# Algae Biotechnology

| NAME OF THE COURSE                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Algae Biotechnology                     |     |   |    |   |  |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|---|----|---|--|
| Code                                                                              | KTM208                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Year of study                           | 2nd |   |    |   |  |
| Course teacher                                                                    | Ph. D. Zvezdana Popović Perković, Assistant Professor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Credits (ECTS)                          | 4.0 |   |    |   |  |
| Associate teachers                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Type of instruction (number of hours)   | L   | S | E  | F |  |
|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                         | 30  | 0 | 15 | 0 |  |
| Status of the course                                                              | Elective                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Percentage of application of e-learning |     |   |    |   |  |
| COURSE DESCRIPTION                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                         |     |   |    |   |  |
| Course objectives                                                                 | - introduction in the basics of systematics, biology and ecology of marine algae<br>- introduction in significance and ways of using algae in biotechnology research and the biotech industry<br>- presentation of possibilities of exploitation and production of algae significant in biotechnology                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                         |     |   |    |   |  |
| Course enrolment requirements and entry competences required for the course       | Basics of biology and/or cell biology                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                         |     |   |    |   |  |
| Learning outcomes expected at the level of the course (4 to 10 learning outcomes) | Upon successful completion of this course, students should:<br>- know the basics of systematics, biology and ecology of marine algae<br>- have knowledge in biology and biotechnological uses of the most important algae genera<br>- know ways of usage of algae in biotech research and the biotech industry including uses as a green fertilizer, green insecticides, as food for humans and animals, for breeding and use of live food in aquaculture, medicine, specialized chemicals, bioremediation and biofuels<br>- know the technology of growing algae for a variety of commercial applications<br>- know the possibilities for exploitation and production of biotechnological significant algae                                                    |                                         |     |   |    |   |  |
| Course content broken down in detail by weekly class schedule (syllabus)          | Week 1: Introduction. Systematics. Anatomy.<br>Week 2: Reproduction. Photosynthesis.<br>Week 3: Systematic division: Cyanobacteria or Cyanophyta<br>Week 4: Systematic division: Cyanobacteria or Cyanophyta<br>Week 5: Systematic division: Rhodophyta<br>Week 6: Systematic division: Ochrophyta<br>Week 7: Systematic division: Chlorophyta<br>Week 8: Ecology.<br>Week 9: Biogeochemical role of algae. The importance of algae<br>I knowledge test<br>Week 10: The industrial use of micro and macro algae: green fertilizers, green insecticides, food for humans and animals,<br>Week 11: The industrial use of micro and macro algae: cultivation and use of live food in aquaculture, pharmaceuticals, specialized chemicals, bioremediation, biofuels |                                         |     |   |    |   |  |

|                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |               |                                                                                                                                                                                                                                                  |                                 |                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|------------------------------|
|                                                                                                                                                                           | Week 12: Technology of cultivation. Growing main genera of cultivating algae. Types of culture.<br>Week 13: Breeding parameters. Farming methods. Determination of the density and growth of algae.<br>14th week: Optimization of production systems. Open systems of cultivation.<br>15th week: A closed photo-bioreactors. Genetic modification.<br>II knowledge test<br>Exercises:<br>Getting acquainted with the work, sampling and processing in a laboratory;<br>Collection of phytobenthic material and its identification by available literature and by microscope; Microscopy of different systematic divisions of Cyanobacteria, Rodophyta, Ochrophyta and Chlorophyta and learning about the habitus morphology, basics of anatomy and reproducing structures; Drying and chemical analysis of algae; Isolation, purification and identification of bioactive compounds from algae. |     |               |                                                                                                                                                                                                                                                  |                                 |                              |
| Format of instruction                                                                                                                                                     | <input checked="" type="checkbox"/> lectures<br><input type="checkbox"/> seminars and workshops<br><input checked="" type="checkbox"/> exercises<br><input type="checkbox"/> <i>on line</i> in entirety<br><input type="checkbox"/> partial e-learning<br><input type="checkbox"/> field work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |               | <input checked="" type="checkbox"/> independent assignments<br><input checked="" type="checkbox"/> multimedia<br><input checked="" type="checkbox"/> laboratory<br><input type="checkbox"/> work with mentor<br><input type="checkbox"/> (other) |                                 |                              |
| Student responsibilities                                                                                                                                                  | Active participation in all activities: lectures, consultations, searching the literature and exercises at least 85%.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |               |                                                                                                                                                                                                                                                  |                                 |                              |
| Screening student work ( <i>name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course</i> ) | Class attendance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.5 | Research      | 0.5                                                                                                                                                                                                                                              | Practical training              |                              |
|                                                                                                                                                                           | Experimental work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1.0 | Report        |                                                                                                                                                                                                                                                  | (Other)                         |                              |
|                                                                                                                                                                           | Essay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     | Seminar essay |                                                                                                                                                                                                                                                  | (Other)                         |                              |
|                                                                                                                                                                           | Tests                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     | Oral exam     |                                                                                                                                                                                                                                                  | (Other)                         |                              |
|                                                                                                                                                                           | Written exam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 2.0 | Project       |                                                                                                                                                                                                                                                  | (Other)                         |                              |
| Grading and evaluating student work in class and at the final exam                                                                                                        | Exams are conducted through written preliminary exams (tests) through the duration of the semester and during exam periods. The difference in taking exams exists only to the extent of material. Tests consist of complex questions in which each sub-question carries a certain part of the points. For a positive evaluation is necessary to solve more than 50% of correct answers. Passed 1st Colloquium allows exit to the second colloquium, while the failure of the 1st Colloquium is directing students for taking the test from the whole curriculum.                                                                                                                                                                                                                                                                                                                                |     |               |                                                                                                                                                                                                                                                  |                                 |                              |
| Required literature (available in the library and via other media)                                                                                                        | Title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |               |                                                                                                                                                                                                                                                  | Number of copies in the library | Availability via other media |
|                                                                                                                                                                           | L. Barsanti, P. Gualtieri: Algae – Anatomy, Biochemistry, and Biotechnology, CRC Taylor and Francis, Boca Raton, 2006.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     |               |                                                                                                                                                                                                                                                  |                                 | Yes                          |
|                                                                                                                                                                           | S. K. Kim: Handbook of Marine Macroalgae, Biotechnology and Applied Phycology, Pukyong National University, Wiley-Blackwell, Oxford, 2012.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     |               |                                                                                                                                                                                                                                                  |                                 | Yes                          |
|                                                                                                                                                                           | FAO, Manual on the production and use of live food for aquaculture, Rome,1996.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |               |                                                                                                                                                                                                                                                  |                                 | Yes                          |
| Optional literature (at the time of submission of study programme proposal)                                                                                               | R. E. Lee: Phycology. Cambridge University Press, Fourth edition, Cambridge. 2008.<br>C. Van den Hoek, D. G. Mann, H. M. Jahns: Algae. An Introduction to Phycology. Cambridge University Press, Cambridge, 1995.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |               |                                                                                                                                                                                                                                                  |                                 |                              |
| Quality assurance                                                                                                                                                         | Quality assurance will be performed at three levels: (1) University Level; (2) Faculty                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     |               |                                                                                                                                                                                                                                                  |                                 |                              |

|                                                         |                                                           |
|---------------------------------------------------------|-----------------------------------------------------------|
| methods that ensure the acquisition of exit competences | Level by Quality Control Committee; (3) Lecturer's Level. |
| Other (as the proposer wishes to add)                   |                                                           |

## Food Biotransformations

| NAME OF THE COURSE                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Food Biotransformations                    |                           |     |    |   |  |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|---------------------------|-----|----|---|--|
| Code                                                                              | KTM209                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Year of study                              |                           | 2nd |    |   |  |
| Course teacher                                                                    | Ph. D. Mila Radan,<br>Assistant Professor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Credits (ECTS)                             |                           | 4.0 |    |   |  |
| Associate teachers                                                                | Ph. D. Franko Burčul,<br>Assistant Professor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Type of instruction<br>(number of hours)   | L                         | S   | E  | F |  |
|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                            | 30                        | 0   | 15 | 0 |  |
| Status of the course                                                              | Elective                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Percentage of<br>application of e-learning |                           |     |    |   |  |
| COURSE DESCRIPTION                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                            |                           |     |    |   |  |
| Course objectives                                                                 | To acquire knowledge about natural way of food biotransformation in production processing (improvement of food: flavour, digestibility and/or shelf life etc.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                            |                           |     |    |   |  |
| Course enrolment requirements and entry competences required for the course       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                            |                           |     |    |   |  |
| Learning outcomes expected at the level of the course (4 to 10 learning outcomes) | After successful completion of this course students should:<br>- Acquire knowledge about enzyme roles in metabolic and biotransformation processes<br>- Be able to explain the general principles of biotransformations<br>- Be able to estimate the characteristics of natural ways to improve the flavour, digestibility and/or shelf life of food products as well as their possible effects and modes of action in biological systems.<br>- Be able to estimate the effect of well-known processes of biotransformations                                                                                                                                                                                                                                               |                                            |                           |     |    |   |  |
| Course content broken down in detail by weekly class schedule (syllabus)          | 1st week: Introduction to biotransformations and biocatalysis<br>2nd week: Basic principles of enzymes: classification<br>3rd week: Basic principles of enzymes: activity and regulation<br>4th week: Metabolic reactions and metabolic products<br>5th week: Metabolic reactions and metabolic products<br>6th week: Microorganisms in food transformations<br>7th week: Other sources of enzymes<br>8th week: Biotechnologically important enzymes<br>9th week: Fermentation<br>10th week: Probiotics<br>11th week: Benefits of biotransformations<br>12th week: Enhancement digestibility, bioavailability and shelf life<br>13th week: Enhancement of flavours<br>14th week: Practical applications of enzymes in food biotransformation<br>15th week: Law regulations |                                            |                           |     |    |   |  |
| Format of                                                                         | ☒ lectures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                            | ☒ independent assignments |     |    |   |  |

|                                                                                                                                                                           |                                                                                                                                                                                                                                               |     |               |                                                                                                                                                                        |                                 |                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|------------------------------|
| instruction                                                                                                                                                               | <input type="checkbox"/> seminars and workshops<br><input checked="" type="checkbox"/> exercises<br><input type="checkbox"/> <i>on line</i> in entirety<br><input type="checkbox"/> partial e-learning<br><input type="checkbox"/> field work |     |               | <input type="checkbox"/> multimedia<br><input checked="" type="checkbox"/> laboratory<br><input type="checkbox"/> work with mentor<br><input type="checkbox"/> (other) |                                 |                              |
| Student responsibilities                                                                                                                                                  | Active participation in all activities: lectures, consultations, searching the literature.                                                                                                                                                    |     |               |                                                                                                                                                                        |                                 |                              |
| Screening student work ( <i>name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course</i> ) | Class attendance                                                                                                                                                                                                                              | 0.5 | Research      | 0.5                                                                                                                                                                    | Practical training              |                              |
|                                                                                                                                                                           | Experimental work                                                                                                                                                                                                                             | 1.0 | Report        |                                                                                                                                                                        | (Other)                         |                              |
|                                                                                                                                                                           | Essay                                                                                                                                                                                                                                         |     | Seminar essay |                                                                                                                                                                        | (Other)                         |                              |
|                                                                                                                                                                           | Tests                                                                                                                                                                                                                                         |     | Oral exam     |                                                                                                                                                                        | (Other)                         |                              |
|                                                                                                                                                                           | Written exam                                                                                                                                                                                                                                  | 2.0 | Project       |                                                                                                                                                                        | (Other)                         |                              |
| Grading and evaluating student work in class and at the final exam                                                                                                        | Final grade will reflect the student's grades obtained on partial exams, seminars and laboratory exercises.<br>Scoring: <60% failed, 60-70% enough (2), 70-80% good (3), 80-90% very good (4), 90-100% excellent (5).                         |     |               |                                                                                                                                                                        |                                 |                              |
| Required literature (available in the library and via other media)                                                                                                        | Title                                                                                                                                                                                                                                         |     |               |                                                                                                                                                                        | Number of copies in the library | Availability via other media |
|                                                                                                                                                                           | L. Barsanti, P. Gualtieri: Algae – Anatomy, Biochemistry, and Biotechnology, CRC Taylor and Francis, Boca Raton, 2006.                                                                                                                        |     |               |                                                                                                                                                                        |                                 | Yes                          |
|                                                                                                                                                                           | S. K. Kim: Handbook of Marine Macroalgae, Biotechnology and Applied Phycology, Pukyong National University, Wiley-Blackwell, Oxford, 2012.                                                                                                    |     |               |                                                                                                                                                                        |                                 | Yes                          |
|                                                                                                                                                                           | FAO, Manual on the production and use of live food for aquaculture, Rome,1996.                                                                                                                                                                |     |               |                                                                                                                                                                        |                                 | Yes                          |
| Optional literature (at the time of submission of study programme proposal)                                                                                               | R. E. Lee: Phycology. Cambridge University Press, Fourth edition, Cambridge. 2008.<br>C. Van den Hoek, D. G. Mann, H. M. Jahns: Algae. An Introduction to Phycology. Cambridge University Press, Cambridge, 1995.                             |     |               |                                                                                                                                                                        |                                 |                              |
| Quality assurance methods that ensure the acquisition of exit competences                                                                                                 | Quality assurance will be performed at three levels: (1) University Level; (2) Faculty Level by Quality Control Committee; (3) Lecturer's Level.                                                                                              |     |               |                                                                                                                                                                        |                                 |                              |
| Other (as the proposer wishes to add)                                                                                                                                     |                                                                                                                                                                                                                                               |     |               |                                                                                                                                                                        |                                 |                              |

## Functional Foods and Nutraceuticals

| NAME OF THE COURSE |                                           | Functional Foods and Nutraceuticals |     |
|--------------------|-------------------------------------------|-------------------------------------|-----|
| Code               | KTM210                                    | Year of study                       | 2nd |
| Course teacher     | Ph. D. Ivana Generalić Mekinić, Assistant | Credits (ECTS)                      | 4.0 |

|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                            |                           |   |    |   |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|---------------------------|---|----|---|
|                                                                                   | Professor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                            |                           |   |    |   |
| Associate teachers                                                                | Ph. D. Danijela Skroza                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Type of instruction<br>(number of hours)   | L                         | S | E  | F |
|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                            | 30                        | 0 | 15 | 0 |
| Status of the course                                                              | Elective                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Percentage of<br>application of e-learning |                           |   |    |   |
| COURSE DESCRIPTION                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                            |                           |   |    |   |
| Course objectives                                                                 | This course will describe functional foods and nutraceuticals, including their classification, health benefits, development, and law regulation. The main focus is on analyses, chemistry, processing, bioavailability, and health benefits of bioactive food components. Students will learn about which constituent make some food functional, and will discuss their chemistry and physiological effects.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                            |                           |   |    |   |
| Course enrolment requirements and entry competences required for the course       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                            |                           |   |    |   |
| Learning outcomes expected at the level of the course (4 to 10 learning outcomes) | By the end of the course students should be able to:<br>- understand fundamental concepts related to functional food and nutraceuticals,<br>- define major nutrient components and specific functional foods,<br>- describe the major health benefits of functional foods and nutraceuticals,<br>- describe the major biological activities,<br>- understand the basic regulation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                            |                           |   |    |   |
| Course content broken down in detail by weekly class schedule (syllabus)          | 1st week: Functional Foods and Nutraceuticals: History and definitions;<br>2nd week: Categories of functional foods<br>3rd week: Nutrition and health (Nutrition related diseases, Bioavailability, Specific health issues...)<br>4th week: Nutrient Components of Foods: Bioactive Carbohydrates<br>5th week: Nutrient Components of Foods: Bioactive Proteins, Peptides and Lipids<br>6th week: Nutrient Components of Foods: Bioactive Carotenoids<br>7th week: Nutrient Components of Foods: Plant Secondary Metabolites<br>8th week: Other non-nutritive components<br>I Colloquium<br>9th week: Specific Functional Foods: Soybean, Fruits and Vegetables<br>10th week: Specific Functional Foods: Milk and Milk Products, Fish, Meat, Miscellaneous Foods and Food Components<br>11th week: Biological activities (Antioxidant properties, Antimicrobial activity, Anticancer agents, Anti-inflammatory properties, Cardiovascular effects, Gastric and hepatic protective effects, Anti-obesity and anti-diabetic activities...)<br>12th week: health benefits of functional foods/ingredients<br>13th week: Current and emerging trends in the production of functional foods and nutraceuticals;<br>14th week: Processing technologies,<br>15th week: Economic aspects, public perception, law regulation and ethical issues<br>II. Colloquium<br>Laboratory exercises<br>- Isolation, purification and identification of bioactive components / fractions of selected foods (eg. pigments, sugars, terpenes, thiols, phenolic compounds ...), (4)<br>- Determination of antioxidant activity (e.g., methods ORAC, FRAP, DPPH, BR, chelating, ...) (5)<br>- Determination of antimicrobial activity (disk diffusion method, determination of minimal inhibitory concentration) (3)<br>- Demonstration: enzymatic inhibition of isolated fractions / compounds (acetylcholine esterase, butyrylcholinesterase), vasodilatory effects, anticarcinogenic activity, ...) |                                            |                           |   |    |   |
| Format of                                                                         | ☒ lectures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                            | ☒ independent assignments |   |    |   |

|                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                   |     |                                                                                                                                                                                   |                                 |                              |  |  |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|------------------------------|--|--|--|
| instruction                                                                                                                                                               | <input type="checkbox"/> seminars and workshops<br><input checked="" type="checkbox"/> exercises<br><input type="checkbox"/> <i>on line</i> in entirety<br><input type="checkbox"/> partial e-learning<br><input type="checkbox"/> field work                                                                                                                                     |     | <input checked="" type="checkbox"/> multimedia<br><input checked="" type="checkbox"/> laboratory<br><input type="checkbox"/> work with mentor<br><input type="checkbox"/> (other) |                                 |                              |  |  |  |
| Student responsibilities                                                                                                                                                  | Active participation in all activities: lectures, consultations, searching the literature.                                                                                                                                                                                                                                                                                        |     |                                                                                                                                                                                   |                                 |                              |  |  |  |
| Screening student work ( <i>name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course</i> ) | Class attendance                                                                                                                                                                                                                                                                                                                                                                  | 0.5 | Research                                                                                                                                                                          | 0.5                             | Practical training           |  |  |  |
|                                                                                                                                                                           | Experimental work                                                                                                                                                                                                                                                                                                                                                                 | 1.0 | Report                                                                                                                                                                            |                                 | (Other)                      |  |  |  |
|                                                                                                                                                                           | Essay                                                                                                                                                                                                                                                                                                                                                                             |     | Seminar essay                                                                                                                                                                     |                                 | (Other)                      |  |  |  |
|                                                                                                                                                                           | Tests                                                                                                                                                                                                                                                                                                                                                                             |     | Oral exam                                                                                                                                                                         |                                 | (Other)                      |  |  |  |
|                                                                                                                                                                           | Written exam                                                                                                                                                                                                                                                                                                                                                                      | 2.0 | Project                                                                                                                                                                           |                                 | (Other)                      |  |  |  |
| Grading and evaluating student work in class and at the final exam                                                                                                        | The final grade is based on the evaluation of partial exams, seminars and laboratory exercises.<br>Scoring: <60% insufficient; 60-70% sufficient (2); 70-80% good (3); 80-90% very good (4); 90-100% excellent (5).                                                                                                                                                               |     |                                                                                                                                                                                   |                                 |                              |  |  |  |
| Required literature (available in the library and via other media)                                                                                                        | Title                                                                                                                                                                                                                                                                                                                                                                             |     |                                                                                                                                                                                   | Number of copies in the library | Availability via other media |  |  |  |
|                                                                                                                                                                           | J. I. Boye: Nutraceutical and Functional Food Processing Technology, John Wiley & Sons, Ltd., 2015.                                                                                                                                                                                                                                                                               |     |                                                                                                                                                                                   |                                 | Yes                          |  |  |  |
|                                                                                                                                                                           | R. E. C. Wildman: Handbook of Nutraceuticals and Functional Foods, Second Edition, CRC Press, Taylor & Francis Group, 2007.                                                                                                                                                                                                                                                       |     |                                                                                                                                                                                   |                                 | Yes                          |  |  |  |
|                                                                                                                                                                           | R. E. Aluko: Functional Foods and Nutraceuticals, Springer-Verlag Berlin Heidelberg New York, 2012.                                                                                                                                                                                                                                                                               |     |                                                                                                                                                                                   |                                 | Yes                          |  |  |  |
|                                                                                                                                                                           | R. Chadwick, S. Henson, B. Moseley, G. Koenen, M. Liakopoulos, C. Midden, A. Palou, G. Rechkemmer, D. Schroder, A. von Wright: Functional Foods, Springer-Verlag Berlin Heidelberg New York, 2003.                                                                                                                                                                                |     |                                                                                                                                                                                   |                                 | Yes                          |  |  |  |
|                                                                                                                                                                           | G. Paliyath, M. Bakovic, K. Shetty: Functional Foods, Nutraceuticals, and Degenerative Disease Prevention, John Wiley & Sons, Ltd., 2011.                                                                                                                                                                                                                                         |     |                                                                                                                                                                                   |                                 | Yes                          |  |  |  |
| Optional literature (at the time of submission of study programme proposal)                                                                                               | Y. Mine, E. Li-Chan, B. Jiang: Bioactive Proteins and Peptides as Functional Foods and Nutraceuticals, Blackwell Publishing Ltd., 2010.<br>M. Skinner, D. Hunter: Bioactives in fruit: health benefits and functional foods, John Wiley & Sons, Ltd., 2013.<br>C. C. Akoh: Handbook of Functional Lipids, CRC Press, Taylor & Francis Group, 2006.<br>Selected scientific papers. |     |                                                                                                                                                                                   |                                 |                              |  |  |  |
| Quality assurance methods that ensure the acquisition of exit competences                                                                                                 | Quality assurance will be performed at three levels: (1) University Level; (2) Faculty Level by Quality Control Committee; (3) Lecturer's Level.                                                                                                                                                                                                                                  |     |                                                                                                                                                                                   |                                 |                              |  |  |  |
| Other (as the proposer wishes to add)                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                   |     |                                                                                                                                                                                   |                                 |                              |  |  |  |

## Ethnobotany

| NAME OF THE COURSE                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Ethnobotany                                |     |    |   |    |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-----|----|---|----|
| Code                                                                              | KTM211                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Year of study                              | 2nd |    |   |    |
| Course teacher                                                                    | Ph. D. Mirko Ruščić,<br>Assistant Professor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Credits (ECTS)                             | 4.0 |    |   |    |
| Associate teachers                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Type of instruction<br>(number of hours)   | L   | S  | E | F  |
|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                            | 15  | 15 | 0 | 15 |
| Status of the course                                                              | Elective                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Percentage of<br>application of e-learning | 5%  |    |   |    |
| COURSE DESCRIPTION                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                            |     |    |   |    |
| Course objectives                                                                 | Student will get the basic knowledge on importance of plants in biosphere, on wild and cultivated plants and they role in human diet.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                            |     |    |   |    |
| Course enrolment requirements and entry competences required for the course       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                            |     |    |   |    |
| Learning outcomes expected at the level of the course (4 to 10 learning outcomes) | <p>After the passing the exam, students will be able to:</p> <ul style="list-style-type: none"><li>-explain the importance of plants in biosphere</li><li>-analyse the connection between human and plants since ancient time till today</li><li>-explain the importance of plant cultivation</li><li>-recognise the mail varieties of grains, their origin and explain their importance for human</li><li>-define the major pulse plants, their orignin and nutritive value</li><li>-make differences between major vegetables, know their origin and explain their use</li><li>-decribe wild plants</li><li>-analyse the differences between different varieties of fruit, define their origin and decribe its importnace in human diet</li><li>-describe some mithological data for different fruits</li><li>-describe the major characteristics of coffee, tea and coccoa and their impact on human health</li><li>-analyse the production process of different beverages and its impact on human health</li><li>-clasify major plants from different biomas on Earth, and analyse their role and application</li><li>-define major plants that are used as spices</li><li>-make differences between toxic plants and know their influence on human health</li><li>-decribe transgenic plants and their role in biodiversity</li></ul> |                                            |     |    |   |    |
| Course content broken down in detail by weekly class schedule (syllabus)          | <p>1st week: The importance of plants for human<br/>2nd week: Plants as food, plant cultivation<br/>3rd week: Plants in diet<br/>4th week: Grains<br/>5th week: Pulses and vegetable<br/>6th week: Fruit<br/>7th week: Wild but edible plants<br/>8th week: Coffee, tea and coccoa<br/>9th week: Alcoholic beverages<br/>10th week: Wood and fibers<br/>11th week: Spices<br/>12th week: Toxic substances from plant- part 1<br/>13th week: Toxic substances from plant- part 2<br/>14th week: Psychoactive components</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                            |     |    |   |    |



|                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                          |     |               |                                                                                                                                                                                                                            |                              |     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-----|
|                                                                                                                                                                           | 15th week: Transgenic plants<br>Final exam<br>Seminars: Selected themes connected to the lectures and discussion<br>Field work: Getting the basic knowledge, preparation of herbarium and photographing plants                                                                                                           |     |               |                                                                                                                                                                                                                            |                              |     |
| Format of instruction                                                                                                                                                     | <input checked="" type="checkbox"/> lectures<br><input type="checkbox"/> seminars and workshops<br><input checked="" type="checkbox"/> exercises<br><input type="checkbox"/> <i>on line</i> in entirety<br><input type="checkbox"/> partial e-learning<br><input type="checkbox"/> field work                            |     |               | <input checked="" type="checkbox"/> independent assignments<br><input type="checkbox"/> multimedia<br><input type="checkbox"/> laboratory<br><input type="checkbox"/> work with mentor<br><input type="checkbox"/> (other) |                              |     |
| Student responsibilities                                                                                                                                                  | Regular attendance class, seminar paper, making herbaruim.                                                                                                                                                                                                                                                               |     |               |                                                                                                                                                                                                                            |                              |     |
| Screening student work ( <i>name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course</i> ) | Class attendance                                                                                                                                                                                                                                                                                                         | 1.0 | Research      |                                                                                                                                                                                                                            | Practical training           |     |
|                                                                                                                                                                           | Experimental work                                                                                                                                                                                                                                                                                                        |     | Report        |                                                                                                                                                                                                                            | Field work                   | 0.5 |
|                                                                                                                                                                           | Essay                                                                                                                                                                                                                                                                                                                    |     | Seminar essay | 0.5                                                                                                                                                                                                                        | (Other)                      |     |
|                                                                                                                                                                           | Tests                                                                                                                                                                                                                                                                                                                    |     | Oral exam     | 1.0                                                                                                                                                                                                                        | (Other)                      |     |
|                                                                                                                                                                           | Written exam                                                                                                                                                                                                                                                                                                             |     | Project       |                                                                                                                                                                                                                            | (Other)                      |     |
| Grading and evaluating student work in class and at the final exam                                                                                                        | Seminars- 10%<br>Herbarium and plant photos – 10%<br>Oral exam – 80%                                                                                                                                                                                                                                                     |     |               |                                                                                                                                                                                                                            |                              |     |
| Required literature (available in the library and via other media)                                                                                                        | Title                                                                                                                                                                                                                                                                                                                    |     |               | Number of copies in the library                                                                                                                                                                                            | Availability via other media |     |
|                                                                                                                                                                           | T. Nikolić: Sistematska botanika, raznolikost i evolucija biljnog svijeta. Alfa, Zagreb, 2013.                                                                                                                                                                                                                           |     |               | 1                                                                                                                                                                                                                          | Yes                          |     |
|                                                                                                                                                                           | L. Luczaj i sur.: Wild vegetable mixed sold in the markets of Dalmatia (Southern Croatia), Journal of ethnobiology and etnomedicine. 9 (2013) 1-12.                                                                                                                                                                      |     |               |                                                                                                                                                                                                                            | Yes                          |     |
|                                                                                                                                                                           | L. Luczaj i sur.: Wild food plant used in the villages of the Lake Vrana Nature Park (northen Dalmatia, Croatia). Acta Soc.Bot. 82 (2013) 275-281.                                                                                                                                                                       |     |               |                                                                                                                                                                                                                            | Yes                          |     |
|                                                                                                                                                                           | G. Mateljan: Najzdravije namirnice svijeta, Profil, Zagreb, 2009.                                                                                                                                                                                                                                                        |     |               |                                                                                                                                                                                                                            | Yes                          |     |
|                                                                                                                                                                           | F. Ehrendorfer, K. Mägdefrau: Sistematika, evolucija i geobotanika, Udžbenik botanike. Školska knjiga, Zagreb, 1984.                                                                                                                                                                                                     |     |               |                                                                                                                                                                                                                            | Yes                          |     |
|                                                                                                                                                                           | D. von Denfer, H. Ziegler: Morfologija i fiziologija, udžbenik botanike. Školska knjiga, Zagreb, 1982.                                                                                                                                                                                                                   |     |               |                                                                                                                                                                                                                            | Yes                          |     |
|                                                                                                                                                                           | B. E. Wyk, M. Wink: Medicinal plants of the world. Timber Press. Portland, London, 2004.                                                                                                                                                                                                                                 |     |               |                                                                                                                                                                                                                            | Yes                          |     |
| Optional literature (at the time of submission of study programme proposal)                                                                                               | I J. Marčinković: Božja biljna ljekarna. Školska knjiga, Zagreb, 2001.<br>S. Sardelić: Samoniklo jestivo bilje, mišanca, gruda, parapač... wild edible herbs- Mišanca, Gruda, Parapač, etnološka istraživanja, 1(12-13) (2008) 387-396.<br>Lj. Grlić: Enciklopedija samoniklog jestivog bilja. A. Cesarec, Zagreb, 1990. |     |               |                                                                                                                                                                                                                            |                              |     |
| Quality assurance methods that ensure the acquisition of exit competences                                                                                                 | Quality assurance will be performed at three levels: (1) University Level; (2) Faculty Level by Quality Control Committee; (3) Lecturer's Level.                                                                                                                                                                         |     |               |                                                                                                                                                                                                                            |                              |     |

|                                       |  |
|---------------------------------------|--|
| Other (as the proposer wishes to add) |  |
|---------------------------------------|--|

## Novel Fruit and Vegetable Products

| NAME OF THE COURSE                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Novel Fruit and Vegetable Products      |     |    |   |   |  |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|----|---|---|--|
| Code                                                                              | KTM212                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Year of study                           | 2nd |    |   |   |  |
| Course teacher                                                                    | Ph. D. Ivana Generalić Mekinić, Assistant Professor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Credits (ECTS)                          | 4.0 |    |   |   |  |
| Associate teachers                                                                | Ph. D. Danijela Skroza                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Type of instruction (number of hours)   | L   | S  | E | F |  |
|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                         | 30  | 15 | 0 | 0 |  |
| Status of the course                                                              | Elective                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Percentage of application of e-learning |     |    |   |   |  |
| COURSE DESCRIPTION                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                         |     |    |   |   |  |
| Course objectives                                                                 | The aim of the course is to introduce students to the new methods and techniques for minimal processing of fruits and vegetables. In addition, they will learn about important role of the raw materials in the production of minimally processed products of high quality, about importance of choosing and performing unit operations, and how to apply appropriate preservatives (particularly against browning) and hygienic products during processing of fresh fruits and vegetables. Through the course, with the help of several case studies, they will learn about types of packaging and a variety of chemical, biochemical and microbiological changes in minimally processed food.                             |                                         |     |    |   |   |  |
| Course enrolment requirements and entry competences required for the course       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                         |     |    |   |   |  |
| Learning outcomes expected at the level of the course (4 to 10 learning outcomes) | After completing the course, students will:<br>- know some of the new techniques used in the processing of fruits and vegetables,<br>- distinguished advantages of the use of such processes compared to the conventional ones,<br>- be able to describe a method for producing minimally processed fruits and vegetables, starting with the selection of species, varieties and determination of the quality of raw materials in order to obtain (produce) high quality finial product,<br>- know the purpose of effective detergent for raw material cleaning, understand the importance of maintaining hygienic conditions, select the appropriate method of packaging and explain its impact on product sustainability. |                                         |     |    |   |   |  |
| Course content broken down in detail by weekly class schedule (syllabus)          | 1st week: Introduction and definition of the new products from fruits and vegetables, fresh-cut fruit and vegetables<br>2nd week: Minimal processing of fruits and vegetables (MPVP) - unit processes and phases<br>3rd week: Minimal processing of fruits and vegetables by thermal and non-thermal techniques<br>4th week: Processing methods and their main characteristics<br>5th week: Packaging methods; Modified atmosphere packaging<br>6th week: New trends in packaging of the processed food<br>7th week: Active and intelligent packaging<br>I colloquium                                                                                                                                                       |                                         |     |    |   |   |  |

|                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |               |                                                                                                                                                                                                                                                  |                                            |                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|------------------------------|
|                                                                                                                                                                           | 8th week: The role of raw material (species, variety) and its quality (level of maturity, health, etc.) on the production of high-quality MPVP.<br>9th week: The role of raw material (species, variety) and its quality (level of maturity, health, etc.) on the production of high-quality MPVP- extension<br>10th week: The application of hygiene agents in the processing of fresh fruits and vegetables<br>11th week: The use of natural preservatives in processing of minimally processed food<br>12th week: Browning prevention<br>13th week: The effect of minimal processing on the microbiological contamination of products<br>14th week: The impact of minimal processing on the quality and life-time of the final product.<br>15th week: The impact of minimal processing on nutritional and phytochemical composition of the final product<br>II. colloquium<br>Seminars:<br>- from raw material to final product - planning and design of new products, each phase of production<br>- Novel fruit products (fresh cut apple production, watermelon, pineapple, etc.).<br>- Novel vegetable products (production of fresh cut lettuce, cabbage, carrots and etc.)<br>- Super fruits and nutritional supplements based on super fruits<br>- Biologically active compounds and their function - Functional Foods<br>- Legal requirements and the HACCP system in minimally processed foods<br>- Presentation of students' seminar papers on selected topic |     |               |                                                                                                                                                                                                                                                  |                                            |                              |
| Format of instruction                                                                                                                                                     | <input checked="" type="checkbox"/> lectures<br><input checked="" type="checkbox"/> seminars and workshops<br><input type="checkbox"/> exercises<br><input type="checkbox"/> <i>on line</i> in entirety<br><input type="checkbox"/> partial e-learning<br><input type="checkbox"/> field work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |               | <input checked="" type="checkbox"/> independent assignments<br><input checked="" type="checkbox"/> multimedia<br><input type="checkbox"/> laboratory<br><input checked="" type="checkbox"/> work with mentor<br><input type="checkbox"/> (other) |                                            |                              |
| Student responsibilities                                                                                                                                                  | Active participation in all activities: lectures, consultations, searching the literature.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |     |               |                                                                                                                                                                                                                                                  |                                            |                              |
| Screening student work ( <i>name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course</i> ) | Class attendance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.5 | Research      |                                                                                                                                                                                                                                                  | Practical training                         |                              |
|                                                                                                                                                                           | Experimental work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     | Report        |                                                                                                                                                                                                                                                  | The laboratory exercises and presentations | 0.5                          |
|                                                                                                                                                                           | Essay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |     | Seminar essay | 1.0                                                                                                                                                                                                                                              | (Other)                                    |                              |
|                                                                                                                                                                           | Tests                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 2.0 | Oral exam     | 1.0                                                                                                                                                                                                                                              | (Other)                                    |                              |
|                                                                                                                                                                           | Written exam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |     | Project       |                                                                                                                                                                                                                                                  | (Other)                                    |                              |
| Grading and evaluating student work in class and at the final exam                                                                                                        | The final grade passed pursuant to mark preliminary exams, seminar essay and laboratory exercises.<br>Rating: <60% not sufficient; 60-70% sufficient (2); 70-80% good (3); 80-90% very good (4); 90-100% excellent (5).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |               |                                                                                                                                                                                                                                                  |                                            |                              |
| Required literature (available in the library and via other media)                                                                                                        | Title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |     |               |                                                                                                                                                                                                                                                  | Number of copies in the library            | Availability via other media |
|                                                                                                                                                                           | S. M. Alzamora, M. S. Tapia, A. Lopez-Malo: Minimally Processed Fruit and Vegetables, Aspen Publishers, Glyndon, 2000.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |               |                                                                                                                                                                                                                                                  |                                            | Yes                          |
|                                                                                                                                                                           | V. M. Gomez-Lopez: Decontamination of Fresh and Minimally Processed Produce. John Wiley & Sons.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |               |                                                                                                                                                                                                                                                  |                                            | Yes                          |

|                                                                             |                                                                                                                                                  |  |     |
|-----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|--|-----|
|                                                                             | USA, 2012.                                                                                                                                       |  |     |
|                                                                             | M. W. Siddiqui, M. S. Rahman: Minimally Processed Foods: Technologies for Safety, Quality, and Convenience. Springer, New York, 2015.            |  | Yes |
|                                                                             | T. Ohlsson, N. Bengtsson: Minimal Processing Technologies in the Food Industry. Woodhead Publishing, England, 2002.                              |  | Yes |
| Optional literature (at the time of submission of study programme proposal) | Selected scientific papers.                                                                                                                      |  |     |
| Quality assurance methods that ensure the acquisition of exit competences   | Quality assurance will be performed at three levels: (1) University Level; (2) Faculty Level by Quality Control Committee; (3) Lecturer's Level. |  |     |
| Other (as the proposer wishes to add)                                       |                                                                                                                                                  |  |     |

## Flavour Chemistry

| NAME OF THE COURSE                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Flavour Chemistry                       |     |   |    |   |  |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|---|----|---|--|
| Code                                                                              | KTM213                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Year of study                           | 2nd |   |    |   |  |
| Course teacher                                                                    | Ph. D. Igor Jerković, Full Professor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Credits (ECTS)                          | 4.0 |   |    |   |  |
| Associate teachers                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Type of instruction (number of hours)   | L   | S | E  | F |  |
|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                         | 30  | 0 | 15 | 0 |  |
| Status of the course                                                              | Elective                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Percentage of application of e-learning |     |   |    |   |  |
| COURSE DESCRIPTION                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                         |     |   |    |   |  |
| Course objectives                                                                 | Acquisition of basic knowledge of flavour chemistry, understanding of the activation of receptors of smell and taste, knowledge of the structure of organic compounds of the typical flavours and their division, knowledge of the basic mechanisms of flavour formation and the flavour isolation methods.                                                                                                                                                                                                                                                                                                 |                                         |     |   |    |   |  |
| Course enrolment requirements and entry competences required for the course       | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                         |     |   |    |   |  |
| Learning outcomes expected at the level of the course (4 to 10 learning outcomes) | After passing the course, students will be able to:<br>- describe the basic concepts, types of flavours, gustatory active molecule, legal regulations related to the flavour toxicological assessment and allowed concentration of biologically active substances<br>- illustrate ways of flavour perception (smell and taste), the mechanisms of development of natural flavour, the division of flavouring substances based on the chemical structure<br>- demonstrate basic procedures of flavour isolation from solid and liquid samples (headspace, volatile, semivolatile and nonvolatile substances) |                                         |     |   |    |   |  |

|                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                          | <ul style="list-style-type: none"> <li>- identify appropriate mechanisms of flavour origin by specific patterns, particularly flavourings derived from carbohydrates and proteins and lipid oxidation flavours</li> <li>- propose appropriate methods of the sample processing taking into account the fundamental principles of distillation and extraction and the possibility of artefacts formation, structural linkage between aromatic compounds and suitable mechanism for their origin</li> <li>- choose the correct chemical approach to solving problems in the field of flavour chemistry, starting from the acquired knowledge in organic chemistry and biochemistry</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Course content broken down in detail by weekly class schedule (syllabus) | <p>1st week: Introduction to the chemistry of flavour. Classification of flavours. Natural, natural identical and artificial flavouring substances. Flavouring preparations. Thermal process flavourings. Smoke flavour. Blends of flavours. Review of the quality of flavour.</p> <p>2nd week: A short overview of the development of flavour chemistry. Legal regulations. Natural, natural identical and artificial flavours – differences between the United States and the EU. New EU legislation.</p> <p>3rd week: Croatian law on flavourings (NN) with emphasis on chemical specifications of flavours and maximum allowed values of biologically active substances in flavoured food. Croatian regulations on food additives (NN). Sweetening agents. Flavour enhancers.</p> <p>4th week: The sense of smell. Activating receptors of smell. The sense of taste - basic taste qualities. Activation of taste receptors. Example of aromagram.</p> <p>5th week: Molecules with sensory effects - examples of chemical structures: stinging molecules; molecules for cooling; strong, sharp molecules with heating and hot stimuli, the molecules with the contraction, shrinkage. The taste active molecule - examples of structures: sweeteners (nutritive, nonnutritious sweeteners, natural carbohydrates, noncarbohydrates, artificial sweeteners), salt, acid, bitter and umami substances (monosodium glutamate, inosine monophosphate).</p> <p>6th week: The division of the flavour substances according to the chemical structure: flavouring substances I (C, H, O compounds: alcohols, phenols, acids, ketones, carotenoids, ionones and related compounds, hydrocarbons) - examples; the flavouring substances II (heterocyclic compounds with oxygen: oxiranes, furans, hydrofurans, pyrans and oxepines; heterocyclic compounds with nitrogen and/or sulphur) - examples, flavouring compounds III (compounds containing sulphur: thiols, thioethers, sulphides, heterocyclic compounds with sulphur) - examples</p> <p>7th week: Mechanisms of flavour formation from the starting compounds. Terpenes (biosynthesis through MVA and DXP). Norisoprenoids (the mechanism of degradation of carotenoids). Phenylpropanoic derivatives (shikimate biogenetic pathway).</p> <p>8th week: Flavours derived from carbohydrates and proteins. Maillard reactions. Aldol reactions and retro-aldol reactions. Strecker degradations (cysteine, methionine). Comparison of Strecker degradation and Amadori rearrangement.</p> <p>9th week: Independent pathways occurrence of Strecker aldehydes. Amadori rearrangement by transamination and Strecker aldehydes formation by decarboxylation of <math>\alpha</math>-oxocarboxylic acids. Strecker degradation and Amadori modelling in the development of flavour and colour.</p> <p>10th week: Heterocyclization (formation of furfural, hydroxymethylfurfural, 5-methyl-4-hydroxy-3(2H)-furanone, formyl furol, isomaltol, pyrazine, oxazole and thiazole). Flavours of thermal degradation of vitamin B1.</p> <p>11th week: Flavours of lipid oxidation. Triplet and singlet oxygen. Lipid oxidation by radicals (initiation, propagation and termination). Hydroperoxides and hydroperoxides breakup. Lactones.</p> <p>12th week: Non-radical lipid oxidation. Enzymatic lipid oxidation (lipoxygenation). Flavours caused by enzymatic reactions and by microorganisms (diacetyl from lactose, the flavours of onion and garlic).</p> <p>13th week: Isolation methods for flavourings. Solvent extraction. Accelerated solvent extraction. Supercritical fluid extraction. The fractionation of the extracts.</p> |

|                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |               |                                                                                                                                                                                                                 |                                 |                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|------------------------------|
|                                                                                                                                                                | Concentration of the extracts.<br>14th week: Distillation methods. Headspace isolation techniques (static, dynamic). Thermal desorption. Sorption techniques: headspace solid-phase microextraction; headspace extraction and extraction from the stirring stick.<br>15th week: Examples of chemical flavour profiles of selected food products: Honey flavour. Flavour of roasted coffee. Flavour of wine. Flavour of meat products. Cheese flavour.                                                                                                                                 |     |               |                                                                                                                                                                                                                 |                                 |                              |
| Format of instruction                                                                                                                                          | <input checked="" type="checkbox"/> lectures<br><input checked="" type="checkbox"/> seminars and workshops<br><input checked="" type="checkbox"/> exercises<br><input type="checkbox"/> <i>on line</i> in entirety<br><input type="checkbox"/> partial e-learning<br><input type="checkbox"/> field work                                                                                                                                                                                                                                                                              |     |               | <input type="checkbox"/> independent assignments<br><input type="checkbox"/> multimedia<br><input type="checkbox"/> laboratory<br><input type="checkbox"/> work with mentor<br><input type="checkbox"/> (other) |                                 |                              |
| Student responsibilities                                                                                                                                       | Students are required to attend classes (lectures and seminars) and actively participate in the teaching process, which will be evaluated in the final assessment by the weight coefficient of 5%.                                                                                                                                                                                                                                                                                                                                                                                    |     |               |                                                                                                                                                                                                                 |                                 |                              |
| Screening student work(name the proportion of ECTS credits for eachactivity so that the total number of ECTS credits is equal to the ECTS value of the course) | Class attendance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1.0 | Research      | 0                                                                                                                                                                                                               | Practical training              | 0                            |
|                                                                                                                                                                | Experimental work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |     | Report        | 0                                                                                                                                                                                                               | (Other)                         |                              |
|                                                                                                                                                                | Essay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0   | Seminar essay | 0                                                                                                                                                                                                               | (Other)                         |                              |
|                                                                                                                                                                | Tests                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0   | Oral exam     | 0                                                                                                                                                                                                               | (Other)                         |                              |
|                                                                                                                                                                | Written exam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 3.0 | Project       | 0                                                                                                                                                                                                               | (Other)                         |                              |
| Grading and evaluating student work in class and at the final exam                                                                                             | Students can take two partial tests during the lectures. If not pass partial tests, students will be evaluated by written exam. Rating at partial tests and the final examination is formed as follows: 51-60% sufficient (2); 61-75% good (3); 76-88% very good (4); 89-100% excellent (5). The total score is formed by summing all activities (for each activity % success multiply weigh coefficient): 5% x the presence and activity in lectures and seminars + 10% x success in experimental work + 40% x performance on the first test + 45% x performance on the second test. |     |               |                                                                                                                                                                                                                 |                                 |                              |
| Required literature (available in the library and via other media)                                                                                             | Title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |               |                                                                                                                                                                                                                 | Number of copies in the library | Availability via other media |
|                                                                                                                                                                | Igor Jerković, Kemija aroma (recenzirana interna skripta), KTF-Split, 2011.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |               |                                                                                                                                                                                                                 | no                              | yes (web page KTF)           |
|                                                                                                                                                                | D. Rowe, Chemistry and Technology of Flavours and Fragrances, Blackwell, 2005                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |               |                                                                                                                                                                                                                 | 2                               | no                           |
|                                                                                                                                                                | C. Fisher, T. R. Scott, Food Flavours: Biology and Chemistry, Royal Chemical Society, 1997                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |               |                                                                                                                                                                                                                 | 1                               | no                           |
| Optional literature (at the time of submission of study programme proposal)                                                                                    | K. A. Smith, Advances in Flavours and Fragrances, Royal Chemical Society, 2001.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |               |                                                                                                                                                                                                                 |                                 |                              |
| Quality assurance methods that ensure the acquisition of exit competences                                                                                      | Quality assurance will be performed at three levels: (1) University Level; (2) Faculty Level by Quality Control Committee; (3) Lecturer's Level.                                                                                                                                                                                                                                                                                                                                                                                                                                      |     |               |                                                                                                                                                                                                                 |                                 |                              |
| Other (as the proposer wishes to add)                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |               |                                                                                                                                                                                                                 |                                 |                              |



## Citrus Processing

| NAME OF THE COURSE                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Citrus Processing                       |                                                                                                                                                                                                                                       |     |    |   |  |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|---|--|
| Code                                                                              | KTM214                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Year of study                           |                                                                                                                                                                                                                                       | 2nd |    |   |  |
| Course teacher                                                                    | Ph. D. Ivana Generalić Mekinić, Assistant Professor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Credits (ECTS)                          |                                                                                                                                                                                                                                       | 4.0 |    |   |  |
| Associate teachers                                                                | Ph. D. Danijela Skroza                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Type of instruction (number of hours)   | L                                                                                                                                                                                                                                     | S   | E  | F |  |
|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                         | 30                                                                                                                                                                                                                                    | 0   | 15 | 0 |  |
| Status of the course                                                              | Elective                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Percentage of application of e-learning |                                                                                                                                                                                                                                       |     |    |   |  |
| COURSE DESCRIPTION                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                         |                                                                                                                                                                                                                                       |     |    |   |  |
| Course objectives                                                                 | Student will acquire the basic practical knowledge on citrus fruits, their nutritive value, processing technologies and know main citrus products                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                         |                                                                                                                                                                                                                                       |     |    |   |  |
| Course enrolment requirements and entry competences required for the course       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                         |                                                                                                                                                                                                                                       |     |    |   |  |
| Learning outcomes expected at the level of the course (4 to 10 learning outcomes) | After passing the exam the student will:<br>- know main characteristics of citrus fruits (taxonomy, morphology and physiology)<br>- be able to demonstrate basic steps in citrus juice processing<br>- know chemical composition and properties of citrus essential oils and ways of their production<br>- know some other citrus products and basic steps in their production and by-products                                                                                                                                                                                                                                                                                                                                                                                                        |                                         |                                                                                                                                                                                                                                       |     |    |   |  |
| Course content broken down in detail by weekly class schedule (syllabus)          | 1st week: Citrus: origin and history<br>2nd week: Development of the citrus industry<br>3rd week: Citrus fruits: chemical composition and properties<br>4th week: Citrus processing<br>5th week: Citrus juices technology. Standards (Codex)<br>6th week: Steps and procedures in the production of citrus juices.<br>7th week: Chemical reactions in the juice production<br>8th week: Other citrus products<br>9th week: Nutritive value of the citrus fruits<br>10th week: Citrus essential oil production<br>11th week: Citrus by-products<br>12th week: Quality control. Legislation<br>13th week: Characterization of the citrus essential oils by HPLC-MS<br>14th week: Present and future application of citrus essential oils.<br>15th week: Therapeutic properties of citrus essential oils |                                         |                                                                                                                                                                                                                                       |     |    |   |  |
| Format of instruction                                                             | <input checked="" type="checkbox"/> lectures<br><input type="checkbox"/> seminars and workshops<br><input checked="" type="checkbox"/> exercises<br><input type="checkbox"/> on line in entirety<br><input type="checkbox"/> partial e-learning<br><input type="checkbox"/> field work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                         | <input type="checkbox"/> independent assignments<br><input checked="" type="checkbox"/> multimedia<br><input checked="" type="checkbox"/> laboratory<br><input type="checkbox"/> work with mentor<br><input type="checkbox"/> (other) |     |    |   |  |
| Student responsibilities                                                          | Admission to the lectures and seminars of at least 70% of the times scheduled.<br>Students are required to attend laboratory practice and field work 100%.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                         |                                                                                                                                                                                                                                       |     |    |   |  |



|                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |               |  |                                 |                              |
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| Screening student work ( <i>name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course</i> ) | Class attendance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.3 | Research      |  | Practical training              |                              |
|                                                                                                                                                                           | Experimental work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     | Report        |  | Practice                        | 0.5                          |
|                                                                                                                                                                           | Essay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     | Seminar essay |  | Preparation for practice        | 0.2                          |
|                                                                                                                                                                           | Tests                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2.0 | Oral exam     |  | (Other)                         |                              |
|                                                                                                                                                                           | Written exam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     | Project       |  | (Other)                         |                              |
| Grading and evaluating student work in class and at the final exam                                                                                                        | The course content is divided into three units that students take over partial exams (**) or joining final exam at the end of the semester (*). The exam is considered passed if students achieve at least 60%. The final grade is based on the evaluation of partial exams. Grades: <60% not satisfied; 60-70% successful (2) 70-80% good (3), 80-90% very good (4), 90-100% excellent (5).                                                                                                                                                                                                                                                                                                      |     |               |  |                                 |                              |
| Required literature (available in the library and via other media)                                                                                                        | Title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |               |  | Number of copies in the library | Availability via other media |
|                                                                                                                                                                           | Z. Berk: Citrus processing, 1st Ed.,Academic press, Elsevier Inc, 2016.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |               |  |                                 | Yes                          |
|                                                                                                                                                                           | I.A. Khan: Citrus Genetics, Breeding and Biotechnology, CAB, UK, 2007.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |               |  |                                 | Yes                          |
|                                                                                                                                                                           | G. Dugo, L. Mondello: Citrus Oils Composition, Advanced Analytical Techniques, Contaminants, and Biological Activity, CRC Press, 2011.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |               |  |                                 | Yes                          |
| Optional literature (at the time of submission of study programme proposal)                                                                                               | G. Dugo, A. Di Giacomo: Citrus The genus citrus, Taylor&Francis, London, 2002.<br>B. S. Patil, N. D. Turner, E. G. Miller, J. S. Brodbelt: Potential Health Benefits of Citrus, American Chemical Society, Washington, DC 2006.<br>D. A. Kimball: Citrus processing. A complete guide, Sec. ed. C.H.I.P.S., 1999.<br>P. R. Ashort, Chemistry and technology of soft drinks and fruit juices, Chipsbooks, 1998.<br>G. A. Tucker, L. F. J. Woods, Enzymes in food processing, AVI Publishing Company, New York, 1991.<br>T. W. Goodwin, Plant pigments, Academic Press Limited, London, 1998.<br>S. Nagy, C. S. Chen, P. E. Shaw, Fruit juice processing and technology, Auburndale, Florida, 1993. |     |               |  |                                 |                              |
| Quality assurance methods that ensure the acquisition of exit competences                                                                                                 | Quality assurance will be performed at three levels: (1) University Level; (2) Faculty Level by Quality Control Committee; (3) Lecturer’s Level.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |               |  |                                 |                              |
| Other (as the proposer wishes to add)                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |               |  |                                 |                              |

## Introduction to Scientific Research

| NAME OF THE COURSE |                                    | Introduction to Scientific Research |     |   |   |   |
|--------------------|------------------------------------|-------------------------------------|-----|---|---|---|
| Code               | KTm215                             | Year of study                       | 2nd |   |   |   |
| Course teacher     | Ph. D. Marina Trgo, Full Professor | Credits (ECTS)                      | 3.0 |   |   |   |
| Associate teachers | Ph. D. Marin Ugrina                | Type of instruction                 | P   | P | P | P |

|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                         |                                                                                                                                                                                                   |    |   |   |
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|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | (number of hours)                       | 15                                                                                                                                                                                                | 15 | 0 | 0 |
| Status of the course                                                              | Mandatory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Percentage of application of e-learning |                                                                                                                                                                                                   |    |   |   |
| COURSE DESCRIPTION                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                         |                                                                                                                                                                                                   |    |   |   |
| Course objectives                                                                 | The aim of the course is to train students for the organization of scientific research, to master the principles and methodology of data collection and literature, the way of processing and data analysis and presentation of results according to the principles of ethical responsibility in the natural, technical and biotechnological sciences.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                         |                                                                                                                                                                                                   |    |   |   |
| Course enrolment requirements and entry competences required for the course       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                         |                                                                                                                                                                                                   |    |   |   |
| Learning outcomes expected at the level of the course (4 to 10 learning outcomes) | It is expected that the learning outcomes provide knowledge about:<br>-understanding of the importance of science and scientific research<br>-types of scientific fields and branches of science, scientific institutions and professions<br>-legislation in science<br>-way to search and use bibliographic databases and other sources of scientific information<br>-organization and implementation of scientific research<br>-understanding of the structure and meaning parts of scientific work<br>-analyse scientific issues and interpretation of results<br>-independent design of scientific work at writing, technical processing, presentation, and presentation<br>-ethical responsibility in scientific research.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                         |                                                                                                                                                                                                   |    |   |   |
| Course content broken down in detail by weekly class schedule (syllabus)          | 1st week: Introductory lecture. The historical development of science. Scientific knowledge.<br>2nd week: Science and legislation (fields and branches of science, scientific institutions, organizations, programs, declarations, scientific degrees)<br>3rd week: Classification and type of papers. The aims and purposes of scientific paper. Differences between the scientific and professional paper.<br>4th week: Components of scientific work (spot the problem, study the problem, set up a hypothesis, design research, conduct research and process the results, confirm or reject the hypothesis, to publish the results)<br>5th week: Sources of information. The literature search. Database.<br>6th week: Experiment. The organization of work in the field and in the laboratory. Planning, implementation and testing.<br>7th week: Processing the results: sorting, statistics, modelling.<br>8th week: Writing an article (scientific, professional, review, scientific and popular).<br>9th week: Presentation of research. Poster presentations.<br>10th week: Presentation of research. Oral presentation. Basic principles in the presentation of work.<br>11th week: References. The use of computer technique in the citation.<br>12th week: Keywords. Graphical abstract.<br>13th week: Applications for the expert and scientific conferences. The publication of the article. Reviews of scientific papers.<br>14th week: Measure the value of articles (citations, indexing, impact factor).<br>15th week: Scientific research ethics.<br>Seminar: writing seminar paper, making poster presentations, making a PowerPoint presentation of the paper and oral presentation. |                                         |                                                                                                                                                                                                   |    |   |   |
| Format of instruction                                                             | <input checked="" type="checkbox"/> lectures<br><input checked="" type="checkbox"/> seminars and workshops<br><input type="checkbox"/> exercises<br><input type="checkbox"/> on line in entirety                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                         | <input checked="" type="checkbox"/> independent assignments<br><input checked="" type="checkbox"/> multimedia<br><input type="checkbox"/> laboratory<br><input type="checkbox"/> work with mentor |    |   |   |

|                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                        |     |               |                                  |                                 |                              |
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|                                                                                                                                                                  | <input type="checkbox"/> partial e-learning<br><input type="checkbox"/> field work                                                                                                                                                                                                                                                                                                                                     |     |               | <input type="checkbox"/> (other) |                                 |                              |
| Student responsibilities                                                                                                                                         | Attending lectures is 80%, while seminars 100% of the total hours.                                                                                                                                                                                                                                                                                                                                                     |     |               |                                  |                                 |                              |
| Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course) | Class attendance                                                                                                                                                                                                                                                                                                                                                                                                       | 0.5 | Research      |                                  | Practical training              |                              |
|                                                                                                                                                                  | Experimental work                                                                                                                                                                                                                                                                                                                                                                                                      |     | Report        |                                  | (Other)                         |                              |
|                                                                                                                                                                  | Essay                                                                                                                                                                                                                                                                                                                                                                                                                  |     | Seminar essay | 1.5                              | (Other)                         |                              |
|                                                                                                                                                                  | Tests                                                                                                                                                                                                                                                                                                                                                                                                                  | 1.0 | Oral exam     |                                  | (Other)                         |                              |
|                                                                                                                                                                  | Written exam                                                                                                                                                                                                                                                                                                                                                                                                           |     | Project       |                                  | (Other)                         |                              |
| Grading and evaluating student work in class and at the final exam                                                                                               | Final written exam or two partial exams (50% of the total evaluation).<br>A written essay (25% of the total evaluation).<br>Oral presentation of written seminar paper (20% of the total evaluation) and poster presentation based on a written seminar paper (5% of the total evaluation). Passing threshold is 60%. Grades: successful (60% – 69%), good (70% – 79%), very good (80% – 89%), excellent (90% – 100%). |     |               |                                  |                                 |                              |
| Required literature (available in the library and via other media)                                                                                               | Title                                                                                                                                                                                                                                                                                                                                                                                                                  |     |               |                                  | Number of copies in the library | Availability via other media |
|                                                                                                                                                                  | M. Marušić i suradnici, Uvod u znanstveni rad u medicini, 5. izdanje, Zagreb, Medicinska naklada, 2013.                                                                                                                                                                                                                                                                                                                |     |               |                                  | 1                               |                              |
|                                                                                                                                                                  | V. Silborčić, Kako sastaviti, objaviti i ocijeniti znanstveno djelo, Zagreb, Medicinska naklada, 2003.                                                                                                                                                                                                                                                                                                                 |     |               |                                  | 1                               |                              |
|                                                                                                                                                                  | J. Kniewald, Metodika znanstvenog rada, Zagreb, Multigraf, 1993.                                                                                                                                                                                                                                                                                                                                                       |     |               |                                  | 1                               |                              |
| Optional literature (at the time of submission of study programme proposal)                                                                                      | A. Tkalac Verčić, Dubravka Sinčić Čorić, Nina Pološki Vokić, Priručnik za metodologiju istraživačkog rada, Zagreb, M.E. P. d.o.o., 2010.<br>M. I. Miljević, Metodologija naučnog rada, Sarajevo, Univerzitet u istočnom Sarajevu, Filozofski fakultet, 2007.<br>Z. V. Popović, Kako napisati i objaviti naučno delo, Beograd, Akademska misao, 2004.                                                                   |     |               |                                  |                                 |                              |
| Quality assurance methods that ensure the acquisition of exit competences                                                                                        | Quality assurance will be performed at three levels: (1) University Level; (2) Faculty Level by Quality Control Committee; (3) Lecturer's Level                                                                                                                                                                                                                                                                        |     |               |                                  |                                 |                              |
| Other (as the proposer wishes to add)                                                                                                                            | Suggestions and reactions of participants during the semester.<br>Student survey.                                                                                                                                                                                                                                                                                                                                      |     |               |                                  |                                 |                              |

## Sensory Evaluation of Food

| NAME OF THE COURSE |                                              | Sensory Evaluation of Food |     |
|--------------------|----------------------------------------------|----------------------------|-----|
| Code               | KTM216                                       | Year of study              | 2nd |
| Course teacher     | Ph. D. Irena Budić-Leto, Assistant Professor | Credits (ECTS)             | 4.0 |

|                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                         |                                                                                                                                                                                                                                       |     |                    |     |
|---------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|--------------------|-----|
| Associate teachers                                                                                                        | Ph. D. Zlatka Knezović                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Type of instruction (number of hours)   | L                                                                                                                                                                                                                                     | S   | E                  | F   |
|                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                         | 20                                                                                                                                                                                                                                    | 15  | 10                 | 0   |
| Status of the course                                                                                                      | Mandatory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Percentage of application of e-learning |                                                                                                                                                                                                                                       |     |                    |     |
| COURSE DESCRIPTION                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                         |                                                                                                                                                                                                                                       |     |                    |     |
| Course objectives                                                                                                         | The objective is to learn students about sensory perception of food and its organoleptic properties, and their aim in the evaluation of food quality and general acception from consumers.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                         |                                                                                                                                                                                                                                       |     |                    |     |
| Course enrolment requirements and entry competences required for the course                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                         |                                                                                                                                                                                                                                       |     |                    |     |
| Learning outcomes expected at the level of the course (4 to 10 learning outcomes)                                         | After student pass the exam he will be able to:<br>- define tha basic terms from the laws on sensory evaluation of food<br>- explain anatomy and physiology basics of organoleptic food analysis<br>- know and distinguish sensory characteristics of different food products<br>- find the connection between sensory evaluation of food and its quality control                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                         |                                                                                                                                                                                                                                       |     |                    |     |
| Course content broken down in detail by weekly class schedule (syllabus)                                                  | 1st week: Introduction to sensory evaluation (definition, historical overview and application)<br>2nd week: Olifactory system - mechanism, properties<br>3rd week: Legislation in sensory evaluation of food<br>4th week: Food properties (taste, smell, sight, texture, hearing)<br>5th week: Physiological elements of sensory evaluation - smell<br>6th week: Physiological elements of sensory evaluation - taste<br>7th week: Organisation of the sensory evaluation - factors that have impact on the evaluation process<br>8th week: Tests in sensory analysis (analitical and customers test)<br>9th week: Test of differences, Affinity tests<br>10th week: Descriptive sensory evaluation<br>11th week: Training<br>12th week: Sensory evaluation in the detection of quality of different products - olive oil<br>13th week: Sensory evaluation in the detection of quality of different products - wine<br>14th week: Sensory evaluation in the detection of quality of different products - milk and cheese<br>15th week: Sensory evaluation in the detection of quality of different products - fermented milk products (jogurth, kefir...)<br>Practice:<br>Learning about basic smells and tastes. Aplication of different tests. |                                         |                                                                                                                                                                                                                                       |     |                    |     |
| Format of instruction                                                                                                     | <input checked="" type="checkbox"/> lectures<br><input type="checkbox"/> seminars and workshops<br><input checked="" type="checkbox"/> exercises<br><input type="checkbox"/> on line in entirety<br><input type="checkbox"/> partial e-learning<br><input type="checkbox"/> field work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                         | <input type="checkbox"/> independent assignments<br><input checked="" type="checkbox"/> multimedia<br><input checked="" type="checkbox"/> laboratory<br><input type="checkbox"/> work with mentor<br><input type="checkbox"/> (other) |     |                    |     |
| Student responsibilities                                                                                                  | Active participation in all activities: lectures, consultations, searching the literature. Attending lectures is 80%, while seminars 100% of the total hours.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                         |                                                                                                                                                                                                                                       |     |                    |     |
| Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is | Class attendance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0.5                                     | Research                                                                                                                                                                                                                              |     | Practical training | 0.5 |
|                                                                                                                           | Experimental work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                         | Report                                                                                                                                                                                                                                |     | (Other)            |     |
|                                                                                                                           | Essay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                         | Seminar essay                                                                                                                                                                                                                         | 1.0 | (Other)            |     |
|                                                                                                                           | Tests                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                         | Oral exam                                                                                                                                                                                                                             |     | (Other)            |     |

|                                                                             |                                                                                                                                                          |     |         |                                 |                              |  |
|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------|---------------------------------|------------------------------|--|
| equal to the ECTS value of the course)                                      | Written exam                                                                                                                                             | 2.0 | Project |                                 | (Other)                      |  |
| Grading and evaluating student work in class and at the final exam          | Written exam after the final lecture.                                                                                                                    |     |         |                                 |                              |  |
| Required literature (available in the library and via other media)          | Title                                                                                                                                                    |     |         | Number of copies in the library | Availability via other media |  |
|                                                                             | H. Stone, J. L. Sidel: Sensory Evaluation Practices 3rd Ed., Elsevier Academic Press San Diego, California, USA, 2004.                                   |     |         |                                 | Yes                          |  |
| Optional literature (at the time of submission of study programme proposal) | H. T. Lawless, H. Heymann: Sensory Evaluation of Food, Principles and Practices, 2nd Ed., Springer Science+Business Media, LLC, New York, NY, USA, 2010. |     |         |                                 |                              |  |
| Quality assurance methods that ensure the acquisition of exit competences   | Quality assurance will be performed at three levels: (1) University Level; (2) Faculty Level by Quality Control Committee; (3) Lecturer's Level.         |     |         |                                 |                              |  |
| Other (as the proposer wishes to add)                                       |                                                                                                                                                          |     |         |                                 |                              |  |

## Novel Food Packaging Techniques

| NAME OF THE COURSE                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Novel Food Packaging Techniques         |     |    |   |   |  |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|----|---|---|--|
| Code                                                                              | KTM217                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Year of study                           | 2nd |    |   |   |  |
| Course teacher                                                                    | Ph. D. Nataša Stipanelov Vrandečić, Full Professor                                                                                                                                                                                                                                                                                                                                                                                                                                        | Credits (ECTS)                          | 4.0 |    |   |   |  |
| Associate teachers                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Type of instruction (number of hours)   | L   | S  | E | F |  |
|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                         | 30  | 15 | 0 | 0 |  |
| Status of the course                                                              | Elective                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Percentage of application of e-learning |     |    |   |   |  |
| COURSE DESCRIPTION                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                         |     |    |   |   |  |
| Course objectives                                                                 | To provide an understanding of novel techniques of packaging in accordance with the characteristics of the food product and market requirements.                                                                                                                                                                                                                                                                                                                                          |                                         |     |    |   |   |  |
| Course enrolment requirements and entry competences required for the course       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                         |     |    |   |   |  |
| Learning outcomes expected at the level of the course (4 to 10 learning outcomes) | After the successfully passed exam student should be able to:<br>- explain the main functions of packaging<br>- describe the various forms of packaging materials in use at the present time<br>- describe the risk associated with potential food contamination<br>- describe the developments in food packaging materials<br>- explain the principles and processes involved in novel packaging techniques: aseptic, active and intelligent packaging, packaging in modified atmosphere |                                         |     |    |   |   |  |

|                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |               |                                                                                                                                                                                                                                       |                    |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--|
| Course content broken down in detail by weekly class schedule (syllabus)                                                                                         | <p>1st week: Introduction in food packaging systems. Functions of food packaging. Packaging materials and forms.</p> <p>2nd week: Aseptic packaging of food. Sterilization of packaging material food contact surfaces.</p> <p>3rd week: Aseptic packaging systems. Integrity testing of aseptic packages.</p> <p>4th week: Packaging of microwavable food.</p> <p>5th week: Vacuum packaging.</p> <p>6th week: Active packaging. Historical development and definitions. Active packaging systems. Self-heating and self-cooling packages;</p> <p>7th week: Active packaging materials. O<sub>2</sub>-absorbing materials; ethylene adsorbers; antioxidant packaging; antimicrobial packaging; flavor/odor absorbers and releasers; microwave susceptors</p> <p>First test.</p> <p>8th week: Intelligent packaging. Indicating product quality: quality or freshness indicators; time–temperature indicators; gas concentration indicators; radio frequency identification; biosensors.</p> <p>9th week: Edible packaging materials: polysaccharides, lipids, proteins, composite materials. Film additives. Bionanocomposites. Commercialization.</p> <p>10th week: Biobased and biodegradable packaging materials, Classification and degradability definitions. Oxo-biodegradable polymers. Starch, hemicellulose, chitosan, poly(lactic acid), biopolyethylene, biopoly(ethylene terephthalate), poly(hydroxyalkanoates)</p> <p>11th week: Properties of biobased packaging materials: barrier and mechanical properties. Current limitations and methods to improve functionality; food packaging applications</p> <p>12th week: Modified atmosphere packaging (MAP): introduction, history and principle. Gases used in MAP. Methods of creating MA conditions: passive and active MA</p> <p>13th week: Equipment for MAP. Packaging for MAP Applications. Microbiology of MAP. Safety of MAP. Applications of MAP.</p> <p>14th week: Modified atmosphere packaging for fresh meat and seafood; horticultural products</p> <p>15th week: Food packaging and sustainability: trends and innovations. Life cycle assessment.</p> <p>Second test.</p> |        |               |                                                                                                                                                                                                                                       |                    |  |
| Format of instruction                                                                                                                                            | <input checked="" type="checkbox"/> lectures<br><input type="checkbox"/> seminars and workshops<br><input type="checkbox"/> exercises<br><input type="checkbox"/> <i>on line</i> in entirety<br><input type="checkbox"/> partial e-learning<br><input type="checkbox"/> field work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |        |               | <input type="checkbox"/> independent assignments<br><input checked="" type="checkbox"/> multimedia<br><input checked="" type="checkbox"/> laboratory<br><input type="checkbox"/> work with mentor<br><input type="checkbox"/> (other) |                    |  |
| Student responsibilities                                                                                                                                         | Lecture attendance: 80 %. Laboratory exercises attendance: 100 %. The preparation and presentation of seminar essay (team work).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |        |               |                                                                                                                                                                                                                                       |                    |  |
| Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course) | Class attendance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1.5    | Research      |                                                                                                                                                                                                                                       | Practical training |  |
|                                                                                                                                                                  | Experimental work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |        | Report        |                                                                                                                                                                                                                                       | (Other)            |  |
|                                                                                                                                                                  | Essay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        | Seminar essay | 0.5                                                                                                                                                                                                                                   | (Other)            |  |
|                                                                                                                                                                  | Tests                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 2.0**  | Oral exam     | (1.0)*                                                                                                                                                                                                                                | (Other)            |  |
|                                                                                                                                                                  | Written exam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | (1.0)* | Project       |                                                                                                                                                                                                                                       | (Other)            |  |
| Grading and evaluating student work in class and at the final exam                                                                                               | CONTINUOUS EVALUATION<br>The complete exam can be passed through two partial tests during semester. Attendance on lectures, A <sub>1</sub> (successfulness =70-100 %), share in grade, k <sub>1</sub> =0,1 Seminar essay+presentation, A <sub>2</sub> (successfulness =60-100 %), share in grade,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |        |               |                                                                                                                                                                                                                                       |                    |  |



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|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|------------------------------|
|                                                                             | $k_2=0,20$<br>1 <sup>st</sup> test, $A_3$ (successfulness =60 -100 %), share in grade, $k_4 =0,35$<br>2 <sup>nd</sup> test, $A_4$ (successfulness =60 -100 %), share in grade, $k_5 =0,35$<br>$GRADE (\%) = 0,10A_1+0,20A_2 + 0,35A_3+ 0,35A_4$<br>FINAL EVALUATION<br>Students who did not take or pass partial tests have to attend to written and oral exam in the regular exam periods.<br>Activities A1 and A2 are evaluated in the same way as indicated above.<br>Written exam, $A_5$ (successfulness =60 -100 %), share in grade, $k_5 =0,30$<br>Oral exam, $A_6$ (successfulness =60 -100 %), share in grade, $k_6 =0,40$<br>$GRADE (\%) = 0,10A_1+0,15A_2 + 0,30A_6 + 0,40A_7$<br>FINAL GRADE: successful (60% – 70 %), good (71% – 80 %), very good (81% – 90 %), excellent (91% – 100 %).<br>In the case that student passed only one test (**) during continuous evaluation, he/she have to attend to written and oral exam in the regular exam periods(*). The passed test will be recognized by the end of the academic year as a part of the written exam. |                                 |                              |
| Required literature (available in the library and via other media)          | Title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Number of copies in the library | Availability via other media |
|                                                                             | I. Vuković, K. Galić, M. Vereš: Ambalaža za pakiranje namirnica, Tectus, Zagreb, 2007.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1                               |                              |
|                                                                             | G. L. Robertson: Food packaging, CRC Press, Boca Raton, 2013.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1                               |                              |
|                                                                             | R. Ahvenainen: Novel food packaging techniques, Woodhead Publishing Limited, Cambridge, 2003.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1                               |                              |
| Optional literature (at the time of submission of study programme proposal) | N. Stipanelov Vrandečić: Ambalaža, recenzirana interna skripta, Kemijsko tehnološki fakultet, Split, 2010.<br>Pravilnik o ambalaži i ambalažnom otpadu, NN/2005.<br>Pravilnik o zdravstvenoj ispravnosti materijala i predmeta koji dolaze u neposredni dodir s hranom, NN/2008.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                 |                              |
| Quality assurance methods that ensure the acquisition of exit competences   | Quality assurance will be performed at three levels: (1) University Level; (2) Faculty Level by Quality Control Committee; (3) Lecturer's Level.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                 |                              |
| Other (as the proposer wishes to add)                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                 |                              |

## Seafood Quality and Safety

| NAME OF THE COURSE   |                                           | Seafood Quality and Safety                 |     |    |    |    |  |
|----------------------|-------------------------------------------|--------------------------------------------|-----|----|----|----|--|
| Code                 | KTM218                                    | Year of study                              | 2nd |    |    |    |  |
| Course teacher       | Ph. D. Vida Šimat,<br>Assistant professor | Credits (ECTS)                             | 4.0 |    |    |    |  |
| Associate teachers   |                                           | Type of instruction<br>(number of hours)   | L   | S  | E  | F  |  |
|                      |                                           |                                            | 30  | 15 | 20 | 10 |  |
| Status of the course | Elective                                  | Percentage of<br>application of e-learning |     |    |    |    |  |
| COURSE DESCRIPTION   |                                           |                                            |     |    |    |    |  |



|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Course objectives                                                                 | Seafood is a high-value food group and an important part of the human diet. Due to its chemical composition seafood falls into easily perishable foods. In the last 20 years there is an increase of infections caused foods and marine origin food poisoning are very common. The presence of biological (bacteria, viruses, parasites) and chemical (residues, biotoxins) hazards in fish and other marine organisms is very difficult to control since they are present in the their natural habitat, thus these organisms presents a risk to consumers and require a control through analytical methods for the detection parameters quality in seafood. This course deals with the quality parameters in seafood. In addition to introducing quality parameters and their role in the quality and food safety, particular attention will be paid to the understanding of the overall functioning of the distribution chain in the food industry. The emphasis of the course is to understand the factors that affect the safety of fishery products, recognition of quality parameters as well as knowledge of the principles and analytical procedures in assessing the quality and safety of fishery products.                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Course enrolment requirements and entry competences required for the course       | Competence in applying knowledge of inorganic and organic chemistry and microbiology and biochemistry.<br>Passed exam in Seafood processing technology.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Learning outcomes expected at the level of the course (4 to 10 learning outcomes) | Upon completion of the course and passing the exam, students will be able to: <ul style="list-style-type: none"> <li>- assess the seafood related hazards that pose a risk to consumers.</li> <li>- recognize and analytically determine specific quality parameters for a particular seafood product.</li> <li>- identify risks of a certain products based on the characteristics of the products (NaCl, aw, pH, temperature).</li> <li>- determine the shelf life of a specific product using relevant sensory, microbiological, biochemical and chemical methods.</li> <li>- assess the risks in the supply chain of fishery products.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Course content broken down in detail by weekly class schedule (syllabus)          | 1st week: Trends and problems in the seafood production, the concept of food quality.<br>2nd week: Spoilage of seafood.<br>3rd week: Postmortem changes in fish.<br>4th week: Postmortem changes in fish - continued.<br>5th week: Freshness degradation and freshness parameters.<br>6th week: Bacterial degradation of fish.<br>7th week: Sensory evaluation of fish quality.<br>8th week: Chemical indicators of freshness and spoilage of fish.<br>9th week: Volatile amines.<br>10th week: Biogenic amines.<br>11th week: Histamine.<br>12th week: Changes in lipids, lipid deterioration.<br>13th week: Changes in physical properties of fish meat.<br>14th week: Bioresiduals and preservatives in fishery products.<br>15th week: Practical application and usage of quality parameters in practice, risk assessment.<br>Exercises:<br>Sensory evaluation of seafood. Distillation method for determining the quantity of TVB-N and TMA-N. Measuring the pH of fish meat, dielectric properties and texture during storage of different species of fish in various storage conditions.<br>Determination of NaCl share in various fishery products. Visit to the Laboratory for quality control of animal origin, Veterinary Institute in Split. Determination of histamine. Measurement of the lipids oxidation parameters during processing and / or storage of seafood, determining the secondary products of lipid oxidation eg. malondialdehyde (MDA), thiobarbituric acid assay / or TBARS TBK. Introducing quality parameters of fish oil. Determination of anisidine value, peroxide value, acidic value and TBARS test for fish oil. |

|                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |         |                                                                                                                                                                                                                                       |  |                                 |                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------------------------------|------------------------------|
| Format of instruction                                                                                                                                                     | <input checked="" type="checkbox"/> lectures<br><input type="checkbox"/> seminars and workshops<br><input checked="" type="checkbox"/> exercises<br><input type="checkbox"/> <i>on line</i> in entirety<br><input type="checkbox"/> partial e-learning<br><input checked="" type="checkbox"/> field work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         | <input checked="" type="checkbox"/> independent assignments<br><input type="checkbox"/> multimedia<br><input checked="" type="checkbox"/> laboratory<br><input type="checkbox"/> work with mentor<br><input type="checkbox"/> (other) |  |                                 |                              |
| Student responsibilities                                                                                                                                                  | Students are required to attend classes (lectures and exercises), actively participate in the teaching process and pass the exam (or 2 tests). The presence at lectures will be recorded, and absence needs to be justified. One hundred percent presence in class will be rewarded with 2 extra points at the test.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |         |                                                                                                                                                                                                                                       |  |                                 |                              |
| Screening student work ( <i>name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course</i> ) | Class attendance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1.0     | Research                                                                                                                                                                                                                              |  | Practical training              |                              |
|                                                                                                                                                                           | Experimental work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |         | Report                                                                                                                                                                                                                                |  | (Other)                         |                              |
|                                                                                                                                                                           | Essay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |         | Seminar essay                                                                                                                                                                                                                         |  | (Other)                         |                              |
|                                                                                                                                                                           | Tests                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1.0*    | Oral exam                                                                                                                                                                                                                             |  | (Other)                         |                              |
|                                                                                                                                                                           | Written exam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | (2.0)** | Project                                                                                                                                                                                                                               |  | (Other)                         |                              |
| Grading and evaluating student work in class and at the final exam                                                                                                        | <p>The class materials are divided into two parts. Students pass the exam separately through two written tests, each carrying 50 points, consisting of materials given in both lectures and exercises. For one part to be considered passed it is necessary to achieve at least 60% score. If a student repeatedly outputs on individual examination, the result will be taken as an average of all previously achieved results (example: first date on Exam A: 15 points (33.3%), the second taking the Exam A: 30 points (66.7% ); result of examination: <math>(15 + 30) / 2 = 22.5</math> points (50%)). At the end of the semester, if the student is satisfied with the grade, it will be entered in the index; otherwise, student can take an oral exam for a higher grade.</p> <p>The final score will be determined according to the criteria: &lt;60% - insufficient, 60% - 70% - sufficient, 71 - 80% - good, 81 - 90% - very good, 91 - 100% - excellent.</p> <p>Additional points (maximum 2) a student can achieve if they show a high degree of interest in the subject, if they are always prepared; if they ask questions and actively participate in discussions, meet all field tasks ect.</p> <p>The requirements for a signature: Class attendance 80% and exercise attendance 100%.</p> |         |                                                                                                                                                                                                                                       |  |                                 |                              |
| Required literature (available in the library and via other media)                                                                                                        | Title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |                                                                                                                                                                                                                                       |  | Number of copies in the library | Availability via other media |
|                                                                                                                                                                           | J. B. Luten, T. Borresen, J. Oehlenschlager: Seafoodfromproducer to consumer, Integrated approach to quality, Elsevier, Amsterdam, 1997.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |                                                                                                                                                                                                                                       |  |                                 | Yes                          |
|                                                                                                                                                                           | H. A. Bremner: Safety and quality issues in Fish Processing, CRC Press, Inc. Boca Raton, Florida, SAD, 2002.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |         |                                                                                                                                                                                                                                       |  |                                 | Yes                          |
|                                                                                                                                                                           | T. Borresen: Improving sea food products for the consumer, Woodhead Publishing Ltd., Cambridge, England, 2008.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |         |                                                                                                                                                                                                                                       |  |                                 | Yes                          |
|                                                                                                                                                                           | I. Martinez, D. James, H. Loreal: Application of modern analytical techniques to ensure sea food safety and authenticity, FAO, Rome, Italy, 2005.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |         |                                                                                                                                                                                                                                       |  |                                 | Yes                          |
|                                                                                                                                                                           | J. Havranek, M. Tudor Kalit, R. Bažok, J. Đugum, D. Grbeša, M. Hadžiosmanović, A. Ivanković, I. Jakopović, S. Orešković, V. Rupić, D. Samaržija: Sigurnost hrane od polja do stola, M.E.P. d.o.o., Zagreb, 2014.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |         |                                                                                                                                                                                                                                       |  |                                 | Yes                          |

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|-----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Optional literature<br>(at the time of<br>submission of study<br>programme<br>proposal) | <p>Methods of Analysis of AOAC International, 2000.</p> <p>S. Duraković: Moderna mikrobiologija namirnica, Udžbenici Sveučilišta u Zagrebu, Zagreb, 2002.</p> <p>F. M. Garfield: Quality Assurance for Analytical Laboratories, AOAC International, Gaithersburg, Md., 2000.</p> <p>S. E. Mortimer, C. A. Wallace, C. A. Cassianos: HACCP, Blackwell Science, Oxford, 2001.</p> <p>V. Turčić: HACCP i higijena namirnica, Zagreb, 2000.</p> <p>M. J. Juran: Planiranje i analiza kvalitete: od razvoja proizvoda do upotrebe 3. izd., Mate, Zagreb, 1999.</p> <p>B. Petz: Osnove statističke metode za ne matematičare, 3. izd., Naklada Slap, 1997.</p> |
| Quality assurance<br>methods that<br>ensure the<br>acquisition of exit<br>competences   | Quality assurance will be performed at three levels: (1) University Level; (2) Faculty Level by Quality Control Committee; (3) Lecturer's Level.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Other (as the<br>proposer wishes to<br>add)                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

## Spectroscopic Methods in Food Analysis

| NAME OF THE COURSE                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Spectroscopic Methods in Food Analysis     |     |    |    |   |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-----|----|----|---|
| Code                                                                              | KTM219                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Year of study                              | 2nd |    |    |   |
| Course teacher                                                                    | Ph. D. Ivica Blažević,<br>Assistant Professor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Credits (ECTS)                             | 4.0 |    |    |   |
| Associate teachers                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Type of instruction<br>(number of hours)   | L   | S  | E  | F |
|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                            | 15  | 15 | 15 | 0 |
| Status of the course                                                              | Elective                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Percentage of<br>application of e-learning |     |    |    |   |
| COURSE DESCRIPTION                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                            |     |    |    |   |
| Course objectives                                                                 | Knowledge of separation and identification methods for organic compounds found in foods important in the food, agricultural, and other industries using the spectra obtained by the modern spectroscopic techniques (MS, UV / Vis, IR, NMR)                                                                                                                                                                                                                                                                                                     |                                            |     |    |    |   |
| Course enrolment requirements and entry competences required for the course       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                            |     |    |    |   |
| Learning outcomes expected at the level of the course (4 to 10 learning outcomes) | After completing the course, the student will become familiarized with the major concepts of organic food analysis, which includes:<br>- choosing a suitable chromatographic method for separation of components of the mixture of substances that have been isolated from food,<br>- select appropriate spectroscopic methods for qualitative analysis to identify food organic compounds of interest,<br>- combining individual spectroscopic methods for structure elucidation;<br>- application of acquired knowledge in research projects. |                                            |     |    |    |   |
| 1                                                                                 | 1st week: Chromatographic separation (TLC, GC, HPLC). Sample preparation.<br>2nd week: Chromatography of volatile (essential oils, pesticides,...) and non-volatile (flavonoids, amino acids, sugars, ...) compounds.                                                                                                                                                                                                                                                                                                                           |                                            |     |    |    |   |

|                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |               |                                                                                                                                                                                                                                                  |                    |  |
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|                                                                                                                                                                           | <p>3rd week: Mass spectrometry (MS). Methods of ionization and mass ionizers. MS / MS methodology.</p> <p>4th week: Examples of different classes of organic compounds.</p> <p>5th week: The analysis of compounds in wine, liquor, juices, essential oils, and the like. (terpenes, norisoprenoids, flavonoids, glucosinolates, pesticides, ...) ..</p> <p>Spectroscopy analysis methods. Electromagnetic spectra. Spectroscopic techniques used in organic compound structure elucidation.</p> <p>6th week: Ultraviolet and visible spectroscopy (UV/Vis): What is a chromophore. Effect of conjugation.</p> <p>7th week: Examples of different classes of organic compounds in food analysis (phenols, flavonoids, anthocyanins, pigments,...).</p> <p>Partial exam (written, 1 hour 15 min)</p> <p>8th week: Infrared spectroscopy (IR) Introduction (IR, NIR, Raman).</p> <p>9th week: Examples of spectra of different classes of organic compounds.</p> <p>10th week: Examples of FTIR spectrum in qualitative analysis and control of various foods (meat and meat products, fish and related products, fruits and vegetables, dairy products and cereals).</p> <p>11th week: Nuclear magnetic resonance spectroscopy (NMR). Basic principles.</p> <p>12th week: <sup>1</sup>H NMR Chemical shift. Spin-spin coupling. Quantitativity.</p> <p>13th week: <sup>13</sup>C NMR. and 2D NMR.</p> <p>14th week: Examples of spectra of different classes of organic compounds.</p> <p>15th week: Application of NMR (examples of spectra) in the quality control of vegetable oil, determining the fat, moisture and sugar in the natural products (ripeness and quality of fruit and vegetables), oil content and moisture content of the grains, authentication of fruit juices and wines, characterization of protein and sugar, and etc ...</p> <p>Partial exam (written, 1 hour 15 min)</p> <p>Laboratory exercises</p> <p>Chromatography (TLC, GC, i/li HPLC) (Separation of complex mixtures of volatile and non-volatile compounds - essential oils, flavonoids, pigments etc.) and mass spectrometry. (4)</p> <p>UV/VIS absorption spectroscopy analyses (essential oils, terpenes, flavonoids, glucosinolates, etc.). (4)</p> <p>IR spectroscopy. Analyses of solid, and liquid mixtures and pure compounds (essential oils, terpenes, flavonoids, glucosinolates, etc.) (4)</p> <p>NMR spectroscopy. Analysis of NMR spectra (<sup>1</sup>H i <sup>13</sup>C NMR) by using SPINWORKS software. Analysis of obtained IR, MS, NMR spectra and comparison by databases available on Internet (SDBS, NIST,...). (3)</p> |     |               |                                                                                                                                                                                                                                                  |                    |  |
| Format of instruction                                                                                                                                                     | <input checked="" type="checkbox"/> lectures<br><input type="checkbox"/> seminars and workshops<br><input checked="" type="checkbox"/> exercises<br><input type="checkbox"/> <i>on line</i> in entirety<br><input checked="" type="checkbox"/> partial e-learning<br><input type="checkbox"/> field work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     |               | <input checked="" type="checkbox"/> independent assignments<br><input checked="" type="checkbox"/> multimedia<br><input checked="" type="checkbox"/> laboratory<br><input type="checkbox"/> work with mentor<br><input type="checkbox"/> (other) |                    |  |
| Student responsibilities                                                                                                                                                  | Active participation in all activities: lectures, consultations, searching the literature.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |               |                                                                                                                                                                                                                                                  |                    |  |
| Screening student work ( <i>name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course</i> ) | Class attendance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1.5 | Research      |                                                                                                                                                                                                                                                  | Practical training |  |
|                                                                                                                                                                           | Experimental work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0.5 | Report        |                                                                                                                                                                                                                                                  | (Other)            |  |
|                                                                                                                                                                           | Essay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     | Seminar essay |                                                                                                                                                                                                                                                  | (Other)            |  |
|                                                                                                                                                                           | Tests                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     | Oral exam     |                                                                                                                                                                                                                                                  | (Other)            |  |
|                                                                                                                                                                           | Written exam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 2.0 | Project       |                                                                                                                                                                                                                                                  | (Other)            |  |
| Grading and                                                                                                                                                               | Course is divided into three sections that students take over 2 partial written and 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |               |                                                                                                                                                                                                                                                  |                    |  |

| evaluating student work in class and at the final exam                      | oral exam or by final exam at the end of the semester. The student pass the exam if he/she achieves at least 60%. The final grade is based on the evaluation of partial exams and laboratory exercises.<br>Scoring: <60% insufficient; 60-70% sufficient (2); 70-80% good (3); 80-90% very good (4); 90-100% excellent (5) |                                 |                              |
|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|------------------------------|
| Required literature (available in the library and via other media)          | Title                                                                                                                                                                                                                                                                                                                      | Number of copies in the library | Availability via other media |
|                                                                             | J. Mohan: Organic Analytical Chemistry, Theory and Practice, Alpha Science International Ltd., Pangbourne England, 2003.                                                                                                                                                                                                   | 1                               |                              |
|                                                                             | R. Flamini, P. Traldi: Mass spectrometry in grape and wine chemistry, Wiley, 2010.                                                                                                                                                                                                                                         |                                 | Yes                          |
|                                                                             | D. W. Sun: Infrared Spectroscopy for Food Quality Analysis and Control, Academic Press, 2009.                                                                                                                                                                                                                              |                                 | Yes                          |
|                                                                             | A. Spyros, P. Dais: NMR Spectroscopy in Food Analysis, The Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge CB4 0WF, UK, 2013.                                                                                                                                                        | 1                               |                              |
| Optional literature (at the time of submission of study programme proposal) | E. Pretsch, P. Buehlmann, C. Affolter: Structure Determination of Organic Compounds, Tables of Spectraldata, Third Edition, Springer-Verlag Berlin Heidelberg, 2000.<br>H. Günzler, H. U. Gremlich: Uvod u infracrvenu spektroskopiju, Školska knjiga Zagreb, 2006.                                                        |                                 |                              |
| Quality assurance methods that ensure the acquisition of exit competences   | Quality assurance will be performed at three levels: (1) University Level; (2) Faculty Level by Quality Control Committee; (3) Lecturer's Level.                                                                                                                                                                           |                                 |                              |
| Other (as the proposer wishes to add)                                       |                                                                                                                                                                                                                                                                                                                            |                                 |                              |

## Ecological Food Production

| NAME OF THE COURSE   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Ecological Food Production              |     |    |   |   |  |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|----|---|---|--|
| Code                 | KTM220                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Year of study                           | 2nd |    |   |   |  |
| Course teacher       | Ph. D. Ivana Generalić Mekinić, Assistant Professor                                                                                                                                                                                                                                                                                                                                                                                                                                              | Credits (ECTS)                          | 4.0 |    |   |   |  |
| Associate teachers   | Ph. D. Danijela Skroza                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Type of instruction (number of hours)   | L   | S  | E | F |  |
|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                         | 30  | 15 | 0 | 0 |  |
| Status of the course | Elective                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Percentage of application of e-learning |     |    |   |   |  |
| COURSE DESCRIPTION   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                         |     |    |   |   |  |
| Course objectives    | The concept of ecological food production do not cover only the production of healthy food (food which production does not include artificial fertilizers, chemicals and pesticides or hormones), but is actually the concept of sustainable management, which involves growing plants, animal food and raw materials by the principles of environmental, economically and socially justified production and technologies with aim of maximal exploitation of particular economy. The aim of the |                                         |     |    |   |   |  |

|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |          |                                                                                                                                                                                                                                       |                    |  |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--|
|                                                                                   | course is to introduce students to the Republic of Croatia and EU legislation for the ecological production and processing of food. Through several examples for food ingredients and/or products they will get the basic knowledge on the selection of varieties/breeds, control of diseases and parasites, growing conditions, storage conditions, processing methods, packaging and presentation of ecological food products.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |          |                                                                                                                                                                                                                                       |                    |  |
| Course enrolment requirements and entry competences required for the course       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |          |                                                                                                                                                                                                                                       |                    |  |
| Learning outcomes expected at the level of the course (4 to 10 learning outcomes) | After completing the course, students will be able to:<br>- know the principles of ecologic food production and food control in the framework of legislative,<br>- be able to analyze and control the process of cultivation, processing and control,<br>- have basic knowledge about the introduction of new methods, ideas and achievements in organic production,<br>- be able to develop new products.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |          |                                                                                                                                                                                                                                       |                    |  |
| Course content broken down in detail by weekly class schedule (syllabus)          | 1st week: Ecological agriculture (Ecological production and products)<br>2nd week Ecological food production - definition, comparison with conventional production, objectives, legislation<br>3rd week: Ecological food production - principles of processing, storage, packaging and presentation of the product<br>4th week: Ecological production in Croatia and abroad<br>5th week: Legislation on organic production in the Republic of Croatia and EU (legislation, regulations, amendments and changes to the law, etc.).<br>I colloquium<br>6th week: Ecological production of medicinal herbs<br>7th week: Ecological production of herbs<br>8th week: Ecological production of fruits and fruit juices<br>9th week: Ecological production of vegetables<br>10th week: Ecological production of olives<br>11th week: Ecological production of cereals and bakery products<br>12th week: Ecological production of mushrooms<br>13th week: Ecological viticulture and wine production<br>14th week: Ecological production of animal products - beekeeping, production in fisheries and aquaculture<br>15th week: Ecological production of animal products - meat, milk and dairy products<br>II Colloquium<br>Seminars:<br>Food handling after harvesting and preparation for processing; Safety in food production (HACCP, Hazard Analysis ...); The fermentation and enzymes in ecological production; Packing and declarations; Legislation related to the ecological production of the selected products; Presentation of students' seminar papers on selected topic |     |          |                                                                                                                                                                                                                                       |                    |  |
| Format of instruction                                                             | <input checked="" type="checkbox"/> lectures<br><input checked="" type="checkbox"/> seminars and workshops<br><input type="checkbox"/> exercises<br><input type="checkbox"/> <i>on line</i> in entirety<br><input type="checkbox"/> partial e-learning<br><input type="checkbox"/> field work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |          | <input checked="" type="checkbox"/> independent assignments<br><input checked="" type="checkbox"/> multimedia<br><input type="checkbox"/> laboratory<br><input type="checkbox"/> work with mentor<br><input type="checkbox"/> (other) |                    |  |
| Student responsibilities                                                          | Active participation in all activities: lectures, consultations, searching the literature.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |          |                                                                                                                                                                                                                                       |                    |  |
| Screening student work (name the proportion of ECTS credits for each              | Class attendance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0.5 | Research |                                                                                                                                                                                                                                       | Practical training |  |
|                                                                                   | Experimental work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |     | Report   |                                                                                                                                                                                                                                       | (Other)            |  |



|                                                                                             |                                                                                                                                                                                                                         |     |               |     |                                 |                              |
|---------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------------|-----|---------------------------------|------------------------------|
| activity so that the total number of ECTS credits is equal to the ECTS value of the course) | Essay                                                                                                                                                                                                                   |     | Seminar essay | 0.5 | (Other)                         |                              |
|                                                                                             | Tests                                                                                                                                                                                                                   | 2.0 | Oral exam     | 1.0 | (Other)                         |                              |
|                                                                                             | Written exam                                                                                                                                                                                                            |     | Project       |     | (Other)                         |                              |
| Grading and evaluating student work in class and at the final exam                          | The final grade passed pursuant to mark preliminary exams, seminar essay and laboratory exercises.<br>Rating: <60% not sufficient; 60-70% sufficient (2); 70-80% good (3); 80-90% very good (4); 90-100% excellent (5). |     |               |     |                                 |                              |
| Required literature (available in the library and via other media)                          | Title                                                                                                                                                                                                                   |     |               |     | Number of copies in the library | Availability via other media |
|                                                                                             | The legislation in the field of organic food production in the Republic of Croatia and the EU.                                                                                                                          |     |               |     |                                 | Web                          |
|                                                                                             | S. Wright: Handbook of Organic Food Processing and Production, First Edition, Springer Science + Business Media, B.V., London, 1994.                                                                                    |     |               |     |                                 | Yes                          |
|                                                                                             | J. G. Brennan, S. Alistair: Food Processing Handbook, Volume 1, Second edition. Wiley-VCH, UK, 2012.                                                                                                                    |     |               |     |                                 | Yes                          |
| Optional literature (at the time of submission of study programme proposal)                 | Selected scientific papers.                                                                                                                                                                                             |     |               |     |                                 |                              |
| Quality assurance methods that ensure the acquisition of exit competences                   | Quality assurance will be performed at three levels: (1) University Level; (2) Faculty Level by Quality Control Committee; (3) Lecturer's Level.                                                                        |     |               |     |                                 |                              |
| Other (as the proposer wishes to add)                                                       |                                                                                                                                                                                                                         |     |               |     |                                 |                              |

# Entrepreneurship and Management in Food and Beverage Production

| NAME OF THE COURSE   |                                                                                             | Entrepreneurship and Management in Food and Beverage Production |     |    |   |   |  |
|----------------------|---------------------------------------------------------------------------------------------|-----------------------------------------------------------------|-----|----|---|---|--|
| Code                 | KTM221                                                                                      | Year of study                                                   | 2nd |    |   |   |  |
| Course teacher       | Ph. D. Nikša Alfirević, Full Professor<br>Ph. D. Ljiljana Najev Čačija, Assistant Professor | Credits (ECTS)                                                  | 4.0 |    |   |   |  |
| Associate teachers   |                                                                                             | Type of instruction (number of hours)                           | L   | S  | E | F |  |
|                      |                                                                                             |                                                                 | 30  | 15 | 0 | 0 |  |
| Status of the course | Elective                                                                                    | Percentage of application of e-learning                         | 10% |    |   |   |  |
| COURSE DESCRIPTION   |                                                                                             |                                                                 |     |    |   |   |  |



|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                            |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Course objectives                                                                 | To conceptualize entrepreneurial project and propose implementation of management functions (planning, organizing, staffing, leadership and control) in food industry context.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                            |
| Course enrolment requirements and entry competences required for the course       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                            |
| Learning outcomes expected at the level of the course (4 to 10 learning outcomes) | <p>By completing this course student will be able to:</p> <ul style="list-style-type: none"> <li>- shape alternative entrepreneurial project proposals</li> <li>- evaluate and judge entrepreneurial project proposals</li> <li>- asses company's environment (organization)</li> <li>- recommend flow for managerial planning</li> <li>- conceptualize organizational structure through organization chart (organigram)</li> <li>- determine approaches to human resources management</li> <li>- assess work effects and compensations management</li> <li>- prearrange leadership and employees motivation approaches</li> </ul> <p>Develope proposition of managerial control process by using basic control methods and techniques</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                            |
| Course content broken down in detail by weekly class schedule (syllabus)          | <p>1st week: Introduction to business. Legal aspect of business (company, organization). Entrepreneurship and management terms.</p> <p>2nd week: Models, approaches and determinants of contemporary entrepreneurship.</p> <p>3rd week: Entrepreneurial incentives and risks. The forms of entrepreneurial support.</p> <p>4th week: Introduction to management. Management functions. Entrepreneur management relationship.</p> <p>5th week: Organizational environment. Environment analysis methods. SWOT and PEST analysis.</p> <p>6th week: Business planning basics. Business plan types and content.</p> <p>7th week: Nature of organizing. Working places and organizational structures.</p> <p>8th week: Basic forms of organizational structures.</p> <p>9th week: Introduction to stuffing. Work place description. Recruiting and employees selection.</p> <p>10th week: Compensational mnagement. Employees costs planning.</p> <p>11th week: Basic determinants of leadership. Leadership in entrepreneurship and management.</p> <p>12th week: Motivation and interpersonal relationship management.</p> <p>13th week: Basic determinant of control. Term, process and control areas.</p> <p>14th week: Entrepreneurial venture control.</p> <p>15th week: Repeating and determing of course materia.</p> <p>Seminars:</p> <p>Organization and company, Legal aspects of business organizations, Food industry specifics, Business ideas generation, Business ideas evaluationg, Introduction to marketing aspect, Marketing aspect elaboration, Organizational aspect of business ideas (working places and organizational structure); Stuff planning in new business venture; Elaboration of selected financial aspects (for business ideas); Motivation for starting new business venture; Leadership; Prezentation and discussion of elaborated business ideas; Repeating and determing course materials.</p> |                                                                                                                                                                                                                            |
| Format of instruction                                                             | <input checked="" type="checkbox"/> lectures<br><input checked="" type="checkbox"/> seminars and workshops<br><input type="checkbox"/> exercises<br><input type="checkbox"/> <i>on line</i> in entirety<br><input type="checkbox"/> partial e-learning<br><input type="checkbox"/> field work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <input checked="" type="checkbox"/> independent assignments<br><input type="checkbox"/> multimedia<br><input type="checkbox"/> laboratory<br><input type="checkbox"/> work with mentor<br><input type="checkbox"/> (other) |

|                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                  |      |               |      |                                 |                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|---------------|------|---------------------------------|------------------------------|
| Student responsibilities                                                                                                                                                  | Active participation in all activities: lectures, consultations, searching the literature.                                                                                                                                                                                                                                                                                                                       |      |               |      |                                 |                              |
| Screening student work ( <i>name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course</i> ) | Class attendance                                                                                                                                                                                                                                                                                                                                                                                                 |      | Research      |      | Practical training              |                              |
|                                                                                                                                                                           | Experimental work                                                                                                                                                                                                                                                                                                                                                                                                |      | Report        |      | Individual work                 | 1.0**                        |
|                                                                                                                                                                           | Essay                                                                                                                                                                                                                                                                                                                                                                                                            |      | Seminar essay |      | (Other)                         |                              |
|                                                                                                                                                                           | Tests                                                                                                                                                                                                                                                                                                                                                                                                            | 2.0* | Oral exam     | 1.0* | (Other)                         |                              |
|                                                                                                                                                                           | Written exam                                                                                                                                                                                                                                                                                                                                                                                                     |      | Project       |      | (Other)                         |                              |
| Grading and evaluating student work in class and at the final exam                                                                                                        | *Two test will be organiyed during semester. Positively graded first test is precondition for second test. Total grade will be formed as a mean of (positive) grades from tests. Positive grade of student's individual work is suptitute for teoretical part of oral exam (in examination period).<br>**Work in gorups, related to business idea development, will be presented and elaborated during semester. |      |               |      |                                 |                              |
| Required literature (available in the library and via other media)                                                                                                        | Title                                                                                                                                                                                                                                                                                                                                                                                                            |      |               |      | Number of copies in the library | Availability via other media |
|                                                                                                                                                                           | M. Buble: Osnove menadžmenta, Sinergija, Zagreb, 2006. (parts)                                                                                                                                                                                                                                                                                                                                                   |      |               |      |                                 | Yes                          |
|                                                                                                                                                                           | D. Kružić: Obiteljsko poduzetništvo, EF Split i EF Mostar, Mostar, 2016. (parts)                                                                                                                                                                                                                                                                                                                                 |      |               |      |                                 | Yes                          |
|                                                                                                                                                                           | I. Matić, I. Pavić, Ž. Mateljak: Menadžment – priručnik za nastavu, Ekonomski fakultet Split, Split, 2009.                                                                                                                                                                                                                                                                                                       |      |               |      |                                 | Yes                          |
| Optional literature (at the time of submission of study programme proposal)                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                  |      |               |      |                                 |                              |
| Quality assurance methods that ensure the acquisition of exit competences                                                                                                 | Quality assurance will be performed at three levels: (1) University Level; (2) Faculty Level by Quality Control Committee; (3) Lecturer's Level.                                                                                                                                                                                                                                                                 |      |               |      |                                 |                              |
| Other (as the proposer wishes to add)                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                  |      |               |      |                                 |                              |

## Communication Skills

| NAME OF THE COURSE   |                                                | Communication Skills                     |     |    |   |   |  |
|----------------------|------------------------------------------------|------------------------------------------|-----|----|---|---|--|
| Code                 | KTM222                                         | Year of study                            | 2nd |    |   |   |  |
| Course teacher       | Ph. D. Mirjana M. Kovač<br>Assistant Professor | Credits (ECTS)                           | 3   |    |   |   |  |
| Associate teachers   |                                                | Type of instruction<br>(number of hours) | L   | S  | E | F |  |
|                      |                                                |                                          | 0   | 30 | 0 | 0 |  |
| Status of the course | Elective                                       | Percentage of                            |     |    |   |   |  |

|                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |                                                                                                                                                                                                                            |     |                    |     |
|---------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|--------------------|-----|
|                                                                                                                           | application of e-learning                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |                                                                                                                                                                                                                            |     |                    |     |
| COURSE DESCRIPTION                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |                                                                                                                                                                                                                            |     |                    |     |
| Course objectives                                                                                                         | <ul style="list-style-type: none"><li>- understand the basic concepts related to verbal and nonverbal communication, as well as the factors that influence these concepts;</li><li>- develop the skills of presentation planning, presentation structure, and presentation performance in the Croatian language;</li><li>- develop pragmatic language competence;</li><li>- adopt the basic principles of written communication.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |                                                                                                                                                                                                                            |     |                    |     |
| Course enrolment requirements and entry competences required for the course                                               | None.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |                                                                                                                                                                                                                            |     |                    |     |
| Learning outcomes expected at the level of the course (4 to 10 learning outcomes)                                         | <p>Students will be able to:</p> <ul style="list-style-type: none"><li>- describe the theories and models of communication;</li><li>- employ active listening techniques;</li><li>- demonstrate questioning skills;</li><li>- give a technical presentation;</li><li>- critically evaluate their own communication skills;</li><li>- recognize disfluent speech;</li><li>- negotiate and demonstrate the skills of assertive communication.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |                                                                                                                                                                                                                            |     |                    |     |
| Course content broken down in detail by weekly class schedule (syllabus)                                                  | <p>1st week: Definitions of communication; Overview of the theory of communication; Cross-cultural communication</p> <p>2nd week: Verbal and nonverbal and paraverbal communication</p> <p>3rd week: Questioning as a communication skill</p> <p>4th week: Active listening and Barriers to active listening</p> <p>5th week: Persuasion skills</p> <p>6th week: Written communication; Project reports - I. part</p> <p>7th week: Written communication; Project reports - II. part</p> <p>I. colloquium</p> <p>8th week: Presentation skills (systematic guide)</p> <p>9th week: Technical presentation</p> <p>10th week: Technical presentation and peer evaluation</p> <p>11th week: Assertive communication and Critical thinking</p> <p>12th week: Public speaking skills</p> <p>13th week: Types of speech disfluencies</p> <p>14th week: Group and Team communication - I. part</p> <p>15th week: Group and Team communication - II. part</p> <p>II. colloquium</p> |     |                                                                                                                                                                                                                            |     |                    |     |
| Format of instruction                                                                                                     | <input type="checkbox"/> lectures<br><input checked="" type="checkbox"/> seminars and workshops<br><input type="checkbox"/> exercises<br><input type="checkbox"/> on line in entirety<br><input type="checkbox"/> partial e-learning<br><input type="checkbox"/> field work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     | <input checked="" type="checkbox"/> independent assignments<br><input type="checkbox"/> multimedia<br><input type="checkbox"/> laboratory<br><input type="checkbox"/> work with mentor<br><input type="checkbox"/> (other) |     |                    |     |
| Student responsibilities                                                                                                  | Active participation in all activities: lectures, consultations, searching the literature, individual work.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |                                                                                                                                                                                                                            |     |                    |     |
| Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is | Class attendance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1.1 | Research                                                                                                                                                                                                                   |     | Practical training |     |
|                                                                                                                           | Experimental work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     | Report                                                                                                                                                                                                                     |     | Individual work    | 1.1 |
|                                                                                                                           | Essay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     | Seminar essay                                                                                                                                                                                                              | 0.5 | (Other)            |     |
|                                                                                                                           | Midterm exam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.2 | Oral exam                                                                                                                                                                                                                  |     | (Other)            |     |

|                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |         |                                 |                              |  |
|-----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------|---------------------------------|------------------------------|--|
| <i>equal to the ECTS value of the course)</i>                               | Written exam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0.1 | Project |                                 | (Other)                      |  |
| Grading and evaluating student work in class and at the final exam          | <p>The final grade is determined as the average of:</p> <ul style="list-style-type: none"><li>- assessment of oral presentation and peer assessment of oral presentation;</li><li>- assessment of written communication skills,</li><li>- written and oral assessment.</li></ul> <p>There are two midterm exams and two examination periods. The first midterm exam is after 7 weeks of lecturing, and the second one is after the next 6 weeks. The lowest passing point is 50% in each midterm exam. The students who do not pass the midterm exams write the exams. The final grade for the course is calculated as a percentage of points earned. The final grade is determined applying the absolute ECTS grading system in accordance with the Rules of the Studying System of the University of Split.</p> <p>At the end of the semester the grades are averaged to form a grade Point Average, according to this scale: 50% - 61% - sufficient (2), 62% - 74%- good (3), 75% - 87% - very good (4), 88% - 100% - excellent (5).</p> <p>Students who fail the two exams in the first examination period take the exam in the autumn final examination period. The final exam consists of the material covered in both midterm exams.</p> |     |         |                                 |                              |  |
| Required literature (available in the library and via other media)          | Title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |         | Number of copies in the library | Availability via other media |  |
|                                                                             | M. M. Kovač, N. Sirković: Presentation, Writing and Interpersonal Communication Skills, FESB, 2014.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |         | 20                              |                              |  |
| Optional literature (at the time of submission of study programme proposal) | J. W. Davies: Communication skills: A Guide for Engineering and Applied Science Students, Pearson: Prentice Hall, 2001.<br>T. E. Harris, J. C. Sherblom: Small Group and Team Communication, Pearson Education/Allyn & Bacon, 2010.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |         |                                 |                              |  |
| Quality assurance methods that ensure the acquisition of exit competences   | Quality assurance will be performed at three levels: (1) University Level; (2) Faculty Level by Quality Control Committee; (3) Lecturer's Level.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |     |         |                                 |                              |  |
| Other (as the proposer wishes to add)                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |         |                                 |                              |  |

## Kinesiological Activity, Fitness and Health

| NAME OF THE COURSE   |                                                                                                                                                        | Kinesiological Activity, Fitness and Health |     |   |    |   |  |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-----|---|----|---|--|
| Code                 | KTM223                                                                                                                                                 | Year of study                               | 2nd |   |    |   |  |
| Course teacher       | Ph. D. Mladen Hraste,<br>Assistant Professor                                                                                                           | Credits (ECTS)                              | 2.0 |   |    |   |  |
| Associate teachers   |                                                                                                                                                        | Type of instruction<br>(number of hours)    | L   | S | E  | F |  |
|                      |                                                                                                                                                        |                                             | 15  | 0 | 30 | 0 |  |
| Status of the course | Elective                                                                                                                                               | Percentage of<br>application of e-learning  | 0   |   |    |   |  |
| COURSE DESCRIPTION   |                                                                                                                                                        |                                             |     |   |    |   |  |
| Course objectives    | The first objective of the course is to help students in understanding and implementation of a healthy way of life. Another goal of the course to over |                                             |     |   |    |   |  |

|                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     |          |                                                                                                                                                                                                                 |                                  |     |
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|                                                                                           | kinesiology operators maintain and improve their health and raise their quality of life and study.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |          |                                                                                                                                                                                                                 |                                  |     |
| Course enrolment requirements and entry competences required for the course               | There are no requirements for subject enrolling.<br>There are no entry competences required.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |          |                                                                                                                                                                                                                 |                                  |     |
| Learning outcomes expected at the level of the course (4 to 10 learning outcomes)         | After completing the course students will be capable:<br>- to implement independent participation in fitness programs<br>- to implement physically active lifestyle<br>- to apply learned knowledge and skills needed for further independent learning and the acquisition of new motor competence<br>- to promote the value of an active and healthy lifestyle<br>- better mental and physical health                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |          |                                                                                                                                                                                                                 |                                  |     |
| Course content broken down in detail by weekly class schedule (syllabus)                  | 1st week: concept and definition of kinesiology;<br>2nd week: development and structure of kinesiology<br>3rd week: term and definition of equation specifications in the sport<br>4th week: the impact and importance of individual factors to success in sports<br>5th week: management and process stages of exercise<br>6th week: kinesiology and health<br>7th week: review of scientific research on the effects of kinesiology to human health I<br>8th week: review of scientific research on the effects of kinesiology to human health II<br>9th week: structure and characteristics of modern aerobics programs<br>10th week: structure and features of the cardio fitness program<br>11th week: structure and features of the weight program<br>12th week: the weight program for the muscles of arms and shoulders<br>13th week: the weight program for the muscles of abdomen<br>14th week: the weight program for the back muscles<br>15th week: the weight program for the muscles of the pelvis and legs<br>The exercises:<br>program of modern aerobics (Pilates 1), a program of modern aerobics (aerobics 1), a program of modern aerobics (zumba), a program of modern aerobics (Pilates 2), a program of modern aerobics (aerobics 2), cardio fitness program on a bicycle ergometer and treadmill (manual and fatburn program), cardio fitness program on a bicycle ergometer and treadmill (interval training high intensity), cardio fitness program on the treadmill and rowing ergometer (manual and fatburn program), cardio fitness program on the treadmill and rowing ergometer interval training high intensity ), the weight program for legs, the weight program for glutes, the weight program for the abdominal muscles, the weight program for arms, the weight program for shoulders, the weight program for back. |     |          |                                                                                                                                                                                                                 |                                  |     |
| Format of instruction                                                                     | <input checked="" type="checkbox"/> lectures<br><input type="checkbox"/> seminars and workshops<br><input checked="" type="checkbox"/> exercises<br><input type="checkbox"/> <i>on line</i> in entirety<br><input type="checkbox"/> partial e-learning<br><input type="checkbox"/> field work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |          | <input type="checkbox"/> independent assignments<br><input type="checkbox"/> multimedia<br><input type="checkbox"/> laboratory<br><input type="checkbox"/> work with mentor<br><input type="checkbox"/> (other) |                                  |     |
| Student responsibilities                                                                  | Active participation of 80% in all activities.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |          |                                                                                                                                                                                                                 |                                  |     |
| Screening student work (name the proportion of ECTS credits for each activity so that the | Class attendance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 2.0 | Research |                                                                                                                                                                                                                 | Practical training               |     |
|                                                                                           | Experimental work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     | Report   |                                                                                                                                                                                                                 | Learning for preparation of exam | 2.0 |

|                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |               |                                 |                              |  |
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| total number of ECTS credits is equal to the ECTS value of the course)      | Essay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  | Seminar essay |                                 | (Other)                      |  |
|                                                                             | Tests                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  | Oral exam     |                                 | (Other)                      |  |
|                                                                             | Written exam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  | Project       |                                 | (Other)                      |  |
| Grading and evaluating student work in class and at the final exam          | <p>The course is rated as the arithmetic mean score of the practical exam and the theoretical exam.</p> <p>The student will get a grade excellent (5) of the practical part of the exam if motor movement performed flawlessly, easily and harmoniously.</p> <p>The student will get a grade very good (4) of the practical part of the exam if motor movement performed flawlessly, easily and harmoniously, but a little "harder".</p> <p>Students will get a good grade (3) of the practical part of the exam if motor movement performed with minor errors and with less difficulty.</p> <p>The student will get a grade sufficient (2) of the practical part of the exam if motor movement performed with major mistakes and with great difficulty.</p> <p>Students will receive an unsatisfactory grade (1) of the practical part of the exam if you can not perform a motor task is not in the elemental form.</p> <p>The theoretical part is taken by written test.</p> |  |               |                                 |                              |  |
| Required literature (available in the library and via other media)          | Title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |               | Number of copies in the library | Availability via other media |  |
|                                                                             | Skripta iz kolegija Kineziološka aktivnost, fitness i zdravlje, <a href="http://www.pmfst.hr/~mhraste/">http://www.pmfst.hr/~mhraste/</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |               |                                 | Web                          |  |
| Optional literature (at the time of submission of study programme proposal) | <p>Dennison, P. E., Dennison, G. E. (2010). Brain Gym: Teacher's Edition. Ventura, CA: Hearts at Play, Inc</p> <p>F. Delavier: Anatomski vodič za vježbe snage. Medicinska naklada, Zagreb, 2009.</p> <p>D. Milanović i sur.: Fitness, Fakultet za fizičku kulturu Sveučilišta u Zagrebu, Zagrebački velesajam, Zagrebački športski savez, Fakultet za fizičku kulturu, 1996.</p> <p>M. Mišigoj-Duraković i sur.:Tjelesno vježbanje i zdravlje. Fakultet za fizičku kulturu Sveučilišta u Zagrebu, 1999.</p> <p>M. Mraković: Osnove sistematske kineziologije. Priručnik za sportske trenere (ur. Milanović D., Kolman M.), Fakultet za fizičku kulturu, Hrvatske olimpijski odbor, Zagrebački sportski savez, 1993.</p> <p>B. J. Sharkey, S. E. Gaskill: Fitness andhealth, Vježbanje i zdravlje, Beograd: Subcom, 2008.</p>                                                                                                                                                   |  |               |                                 |                              |  |
| Quality assurance methods that ensure the acquisition of exit competences   | I Quality assurance will be performed at three levels: (1) University Level; (2) Faculty Level by Quality Control Committee; (3) Lecturer's Level.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |               |                                 |                              |  |
| Other (as the proposer wishes to add)                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |               |                                 |                              |  |

### 3. STUDY PERFORMANCE CONDITIONS

#### 3.1. Places of the study performance

| Buildings of the constituent part (name existing, under construction and planned buildings) |                                               |
|---------------------------------------------------------------------------------------------|-----------------------------------------------|
| Identification of building                                                                  | Three faculties building                      |
| Location of building                                                                        | Ruđera Boškovića 35                           |
| Year of completion                                                                          | 2015.                                         |
| Total square area in m <sup>2</sup>                                                         | 29500                                         |
| Identification of building                                                                  | Kaštel Sućurac building, z.k. 1053/1 i 1053/7 |
| Location of building                                                                        | Kaštel Sućurac                                |
| Year of completion                                                                          | 1961.                                         |
| Total square area in m <sup>2</sup>                                                         | 3000                                          |

### 3.2. List of teachers and associate teachers

| Cours                                                           | Teachers and associate teachers                                                           |
|-----------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| Biochemical Engineering                                         | Ph. D. Sandra Syilović, Associate Professor<br>Ph. D. Antonija Čelan                      |
| Algae Biotechnology                                             | Ph. D. Zvezdana Popović Perković, Assistant Professor                                     |
| Food Biotransformations                                         | Ph. D. Mila Radan, Assistant Professor<br>Ph. D. Franko Burčul, Assistant Professor       |
| Ecological Food Production                                      | Ph. D. Ivana Generalić Mekinić, Assistant Professor<br>Ph. D. Danijela Skroza             |
| Ethnobotany                                                     | Ph. D. Mirko Ruščić, Assistant Professor                                                  |
| Fermented Dairy Products and Cheesemaking                       | Ph. D. Tea Bilušić, Full Professor                                                        |
| Physical Properties of Food                                     | Ph. D. Vesna Sokol, Associate Professor<br>Ph. D. Perica Bošković                         |
| Functional Foods and Nutraceuticals                             | Ph. D. Ivana Generalić Mekinić, Assistant Professor<br>Ph. D. Danijela Skroza             |
| Flavour Chemistry                                               | Ph. D. Igor Jerković, Full Professor                                                      |
| Kinesiological Activity, Fitness and Health                     | Ph. D. Mladen Hraste, Assistant Professor                                                 |
| Communication Skills                                            | Ph. D. Mirjana M. Kovač<br>Assistant Professor                                            |
| Corrosion and Materials Protection                              | Ph. D. Senka Gudić, Full Professor                                                        |
| Seafood Quality and Safety                                      | Ph. D. Vida Šimat, Assistant Professor                                                    |
| Honey and Other Bee Products                                    | Ph. D. Dragan Bubalo, Associate Professor<br>Ph. D. Igor Jerković, Full Professor         |
| Mediterranean Diet                                              | Ph. D. Tea Bilušić, Full Professor                                                        |
| Novel Food Processing Technologies                              | Ph. D. Ivana Generalić Mekinić, Assistant Professor<br>Ph. D. Danijela Skroza             |
| Novel Fruit and Vegetable Products                              | Ph. D. Ivana Generalić Mekinić, Assistant Professor<br>Ph. D. Danijela Skroza             |
| Sustainable Technologies in Food Industry                       | Ph. D. Marina Trgo, Full Professor<br>Ph. D. Ivona Nuić                                   |
| Entrepreneurship and Management in Food and Beverage Production | Ph. D. Nikša Alfirić, Full Professor<br>Ph. D. Ljiljana Najev Čačija, Assistant Professor |
| Citrus Processing                                               | Ph. D. Ivana Generalić Mekinić, Assistant Professor<br>Ph. D. Danijela Skroza             |
| Applied Mathematics                                             | Nives Baranović, Lecturer                                                                 |
| Process Design                                                  | Ph. D. Nediljka Vukojević Medvidović, Associate                                           |



|                                                      |                                                                                                     |
|------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
|                                                      | Professor                                                                                           |
| Sensory Evaluation of Food                           | Ph. D. Irena Budić-Leto, Assistant Professor<br>Ph. D. Zlatka Knezović                              |
| Food Safety                                          | Ph. D. Tea Bilušić, Full Professor                                                                  |
| Spectroscopic Methods in Food Analysis               | Ph. D. Ivica Blažević, Assistant Professor                                                          |
| Novel Food Packaging Techniques                      | Ph. D. Nataša Stipanelov Vrandečić, Full Professor                                                  |
| Alcoholic Beverages Technology                       | Ph. D. Ivana Generalić Mekinić, Assistant Professor<br>Ph. D. Irena Budić-Leto, Assistant Professor |
| Technology of Meat and Meat Products                 | Ph. D. Mladenka Malenica Staver, Assistant Professor                                                |
| Fruit and Vegetable Processing                       | Ph. D. Tea Bilušić, Full Professor<br>Ph. D. Danijela Skroza                                        |
| Processing Technology of Species and Medicinal Herbs | Ph. D. Igor Jerković, Full Professor                                                                |
| Olive Processing Technologies                        | Ph. D. Ivica Ljubenković, Assistant Professor                                                       |
| Seafood Processing Technology                        | Ph. D. Vida Šimat, Assistant Professor                                                              |
| Wine Technology                                      | Ph. D. Irena Budić-Leto, Assistant Professor                                                        |
| Technology of Cereals                                | Ph. D. Tea Bilušić, Full Professor<br>Ph. D. Danijela Skroza                                        |
| Introduction to Scientific Research                  | Ph. D. Marina Trgo, Full Professor<br>Ph. D. Marin Ugrina                                           |

### 3.3. Curriculum vitae of the cours teacher

|                                                                                                                                                       |                                                                                                                                                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| First and last name and title of teacher                                                                                                              | <b>Ph. D. Nikša Alfirević, Full Professor</b>                                                                                                                                           |
| The course he/she teaches in the proposed study programme                                                                                             | Entrepreneurship and management in food and beverage production                                                                                                                         |
| <b>GENERAL INFORMATION ON COURSE TEACHER</b>                                                                                                          |                                                                                                                                                                                         |
| Address                                                                                                                                               | Ruđera Boškovića 5, Split                                                                                                                                                               |
| Telephone number                                                                                                                                      | 098 85 22 69                                                                                                                                                                            |
| E-mail address                                                                                                                                        | <a href="mailto:nalf@efst.hr">nalf@efst.hr</a>                                                                                                                                          |
| Personal web page                                                                                                                                     | <a href="http://moj.efst.hr/content.php?k=studiji&amp;p=69&amp;osoba=nalf">http://moj.efst.hr/content.php?k=studiji&amp;p=69&amp;osoba=nalf</a>                                         |
| Year of birth                                                                                                                                         | 1972                                                                                                                                                                                    |
| Scientist ID                                                                                                                                          | 232134                                                                                                                                                                                  |
| Research or art rank, and date of last rank appointment                                                                                               |                                                                                                                                                                                         |
| Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment                                                           | Full professor (tenured), 30.6.2016.                                                                                                                                                    |
| Area and field of election into research or art rank                                                                                                  | Social sciences, economics                                                                                                                                                              |
| <b>INFORMATION ON CURRENT EMPLOYMENT</b>                                                                                                              |                                                                                                                                                                                         |
| Institution where employed                                                                                                                            | University of Split, Faculty of Economics                                                                                                                                               |
| Date of employment                                                                                                                                    | 1.10.1996.                                                                                                                                                                              |
| Name of position (professor, researcher, associate teacher, etc.)                                                                                     | Full Professor                                                                                                                                                                          |
| Field of research                                                                                                                                     | Management and organization; IT management                                                                                                                                              |
| Function                                                                                                                                              | Full Professor                                                                                                                                                                          |
| <b>INFORMATION ON EDUCATION – Highest degree earned</b>                                                                                               |                                                                                                                                                                                         |
| Degree                                                                                                                                                | PhD (economics); PhD (sociology)                                                                                                                                                        |
| Institution                                                                                                                                           | University of Split – Faculty of Economics; University of Klagenfurt                                                                                                                    |
| Place                                                                                                                                                 | Split (Croatia); Klagenfurt (Austria)                                                                                                                                                   |
| Date                                                                                                                                                  | 2003; 2009                                                                                                                                                                              |
| <b>INFORMATION ON ADDITIONAL TRAINING</b>                                                                                                             |                                                                                                                                                                                         |
| Year                                                                                                                                                  | 2011-2013                                                                                                                                                                               |
| Place                                                                                                                                                 | Klagenfurt                                                                                                                                                                              |
| Institution                                                                                                                                           | Alpen Adria University of Klagenfurt                                                                                                                                                    |
| Field of training                                                                                                                                     | Erasmus mobility – planning, implementation and teaching on the international graduate (master) programs, delivered in English                                                          |
| <b>MOTHER TONGUE AND FOREIGN LANGUAGES</b>                                                                                                            |                                                                                                                                                                                         |
| Mother tongue                                                                                                                                         | Croatian                                                                                                                                                                                |
| Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)                                                      | English (5)<br>German (3)                                                                                                                                                               |
| <b>COMPETENCES FOR THE COURSE</b>                                                                                                                     |                                                                                                                                                                                         |
| Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme) | Teaches courses <i>Management</i> , <i>Change management</i> , <i>Business intelligence</i> and <i>E-business</i> on undergraduate and graduate level at the Faculty of Economics Split |
| Authorship of university/faculty                                                                                                                      | N. Alfirević, I. Pavić, I. Matić: Menadžment: Priručnik za                                                                                                                              |

|                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
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| textbooks in the field of the course                                                                                                            | nastavu. Split: Ekonomski fakultet Split, odobreni priručnik Sveučilišta u Splitu, 2008.<br>J. Pavičić, N. Alfirević, Lj. Aleksić: Marketing i menadžment u kulturi i umjetnosti. Zagreb: Masmedia, odobreni udžbenik Sveučilišta u Splitu, 2006.<br>N. Alfirević, J. Pavičić, Lj. Najev Čačija, Z. Mihanović, J. Matković: Osnove marketinga i menadžmenta neprofitnih organizacija. Zagreb : Školska knjiga, Institut za inovacije, odobreni udžbenik Sveučilišta u Splitu, 2013.<br>N. Alfirević, D. Garbin Praničević, A. Talaja: Upravljanje organizacijskim promjenama i znanjem, Ekonomski fakultet Split, odobreni udžbenik Sveučilišta u Splitu, 2014.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)                     | N. Alfirević, A. Talaja: Managing Knowledge through Dynamic Capabilities; Learning Models for Innovation in Organizations: Examining Roles of Knowledge Transfer and Human Resources Management / Soliman, Fawzy (ur.). Hershey (PA), USA : IGI Global Inc (2014) 157-172.<br>N. Alfirević, M. Dorotić, M. Hajdić: Novel customer collaboration and networking tools for cultivating external information, Proceedings of the 9th IFKAD (International Forum on Knowledge Asset Dynamics): Knowledge and Management Models for Sustainable Growth/Carlucci, D.; Spender, J.C.; Schiuma, G. (ur.). Basilicata: Institute of Knowledge Asset Management, Arts for Business Institute & University of Basilicata (2014) 1334-1345.<br>N. Alfirević, J. Pavičić, V. Gnjidić: Cognitive Structure, Managers' Shared Social Understanding: From Psychological and Sociological Concepts to Managerial Strategic Choices. Zagreb International Review of Economics and Business. 17 (2014) 2, 83-96.<br>N. Alfirević: Oblici upravljanja znanjem i unapređenja poslovnih procesa. Utjecaj organizacijskih varijabli na uspjeh programa unapređenja poslovnih procesa (Empirijsko istraživanje). Buble, M. (ur.). Split: Ekonomski fakultet Split (2012) 101-106.<br>Ž. Dulčić, N. Alfirević, V. Gnjidić: From Five Competitive Forces to Five Collaborative Forces: Revised View on Industry Structure-firm Interrelationship. Procedia - Social and Behavioral Sciences. 58 (2012) 1077-1084. |
| Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most) | Međunarodni andragoški simpozij: Ključne kompetencije i učenje odraslih / Pavkov, Marija; Alfirević, Nikša (ur.). Zagreb : Agencija za strukovno obrazovanje i obrazovanje odraslih, 2013.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>PRIZES AND AWARDS, STUDENT EVALUATION</b>                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Prizes and awards for teaching and scholarly/artistic work                                                                                      | 2009 – Annual award of the University of Split – Faculty of Economics<br>2009 – Annual award Mijo Mirković of the University of Zagreb – Faculty of Economics and Business, for scientific work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

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|------------------------------------------|----------------------------------|
| First and last name and title of teacher | <b>Nives Baranović, Lecturer</b> |
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| The course he/she teaches in the proposed study programme                                                                                             | Applied Mathematics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>GENERAL INFORMATION ON COURSE TEACHER</b>                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Address                                                                                                                                               | Marasovića 57/4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Telephone number                                                                                                                                      | ++385 95 85 72 585                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| E-mail address                                                                                                                                        | njozic@ffst.hr; nives.baranovic@gmail.com                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Personal web page                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Year of birth                                                                                                                                         | 1973                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Scientist ID                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Research or art rank, and date of last rank appointment                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment                                                           | Lecturer, 2011.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Area and field of election into research or art rank                                                                                                  | Natural Sciences, Mathematics, Mathematic analysis                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>INFORMATION ON CURRENT EMPLOYMENT</b>                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Institution where employed                                                                                                                            | Faculty of Humanities and Social Sciences, University of Split                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Date of employment                                                                                                                                    | February 1 <sup>st</sup> , 2011.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Name of position (professor, researcher, associate teacher, etc.)                                                                                     | Lecturer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Field of research                                                                                                                                     | Mathematics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Function                                                                                                                                              | Lecturer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>INFORMATION ON EDUCATION – Highest degree earned</b>                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Degree                                                                                                                                                | Professor of mathematics and informatics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Institution                                                                                                                                           | Faculty of Sciences, University of Split                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Place                                                                                                                                                 | Split                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Date                                                                                                                                                  | 1998.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>INFORMATION ON ADDITIONAL TRAINING</b>                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Year                                                                                                                                                  | Since 1999. continously                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Place                                                                                                                                                 | Zagreb, Split, Opatija, Šibenik                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Institution                                                                                                                                           | MZOŠ, AZOO, NCVVO, HMD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Field of training                                                                                                                                     | Mathematics, Psychology, Pedagogy, Education                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>MOTHER TONGUE AND FOREIGN LANGUAGES</b>                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Mother tongue                                                                                                                                         | Croatian                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)                                                      | English (4)<br>Italian (2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>COMPETENCES FOR THE COURSE</b>                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme) | Monitoring the work of teachers and professors of mathematics, AZOO, 2006. – 2011., senior adviser for mathematics;<br>Mathematics 1, Faculty of Maritime Studies, University of Split, 2010.-2011., assistant;<br>Mathematics 1, Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture, University of Split, 2007.-2010., assistant;<br>Applied Mathematics, Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture, University of Split, 2007.-2009., assistant;<br>Mathematics and informatics, Elementary School Manuš, Split, 1999. – 2006., teacher;<br>Methodics of mathematics, Faculty of Sciences, University of Split, 2004. – 2006., assistant;<br>Informatics, Highschool Queen Jelena, Split, 2004. – 2006., |

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|                                                                                                                                                                                                 | teacher;<br>Mathematics and Informatics, Technical School Ban Josip Jelačića, Sinj, 1998. – 1999., teacher.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Authorship of university/faculty textbooks in the field of the course                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)                                                                     | N. Baranović: "Potencijal jednog zadatka izveden na temelju Talesovog teorema o proporcionalnim dužinama", U zborniku radova Peti simpozijum Matematika i primene, Beograd: Matematički fakultet, (2014)<br>N. Jozić: Formuliranje matematičkih definicija i iskaza teorema u svrhu kritičkog promišljanja i zaključivanja, zbornik radova Četvrti simpozijum <i>Matematika i primene</i> , Beograd: Matematički fakultet, 2013.<br>N. Jozić, M. Mateljević, M. Svetlik, Istraživanjem do minimuma ili maksimuma, zbornik radova Treći simpozijum <i>Matematika i primene</i> , uredili Z. Stanimirović, M. Marić, M. Svetlik, Marek, Beograd: Matematički fakultet (2012.) 35 – 54.                                                                                                                                                                                                    |
| Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)                                                 | N. Baranović: Učenje temeljeno na čitanju s razumijevanjem, e-zbornik povzetkov 2. međunarodne Konferencije o učenju in poučevanju matematike (KUPM 2014)<br><a href="http://www.zrss.si/kupm2014/files/povzetki-cetrtek-SLO/#/8/">http://www.zrss.si/kupm2014/files/povzetki-cetrtek-SLO/#/8/</a> .<br>N. Jozić: Učenje usmjerenim opažanjem, zbornik prispevkov 1. <i>mednarodna Konferenca o učenju in poučevanju matematike</i> , uredili S. Kmetič, J. Bone, S. Rajh, A. Sambolić Beganović, M. Sirnik, M. Suban Ambrož, Maribor (2012) 58 - 66.<br><a href="http://www.zrss.si/pdf/zbornikprispevkovkupm2012.pdf">http://www.zrss.si/pdf/zbornikprispevkovkupm2012.pdf</a><br>N. Jozić: Fotografija kao inovativno nastavno sredstvo, zbornik radova <i>Peti kongres nastavnika matematike RH</i> , uredili I. Ivanšić, P. Mladinić, R. Svedrec, Zagreb: Profil (2012) 257 – 270. |
| Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)                                                                           | According to the resolution of Faculty of Humanities and Social Sciences, University of Split assembly (Klasa: 003-08/15-06/0015, Ur.broj: 2181-190-00-15-0038 i Ur.broj: 2181-190-00-15-0042) my two lectures were published online on Faculties website: Basics of mathematical logic and Basics of sets. The lectures can be viewed online:<br><a href="http://www.ffst.unist.hr/knjiznica/izdavastvo/predavanja">http://www.ffst.unist.hr/knjiznica/izdavastvo/predavanja</a> .<br>During 2015. i 2016. on Faculty of Humanities and Social Sciences, University of Split (in cooperation with University of Zadar) I made experimental study under name Cognitive development and learning outcomes of geometry of students of teacher studies (KRIUGS 2015).                                                                                                                      |
| The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoške kompetencije? | In the normal course of study (profesor of mathematics and informatics) and through continuous lifelong learning since 1999.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>PRIZES AND AWARDS, STUDENT EVALUATION</b>                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Prizes and awards for teaching and scholarly/artistic work                                                                                                                                      | Award of Splitsko-dalmatinska županija for excellent work with talented pupils, 2000. – 2006.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

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| grading scale and course evaluated) |  |
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| First and last name and title of teacher                                                    | <b>Ph.D. Tea Bilušić, Full Professor</b>                                                                                                                                                                                                                                                                                           |
| The course he/she teaches in the proposed study programme                                   | Food Safety; Fermented dairy products and cheesemaking; Technology of fruits and vegetables processing; Technology of cereals; Mediterranean diet                                                                                                                                                                                  |
| <b>GENERAL INFORMATION ON COURSE TEACHER</b>                                                |                                                                                                                                                                                                                                                                                                                                    |
| Address                                                                                     | Ruđera Boškovića 35, 21 000 Split, Croatia                                                                                                                                                                                                                                                                                         |
| Telephone number                                                                            | +385 21 329 466                                                                                                                                                                                                                                                                                                                    |
| E-mail address                                                                              | tea@ktf-split.hr                                                                                                                                                                                                                                                                                                                   |
| Personal web page                                                                           | <a href="https://tkojetko.irb.hr/znanstvenikDetalji.php?sifznan=8413">https://tkojetko.irb.hr/znanstvenikDetalji.php?sifznan=8413</a>                                                                                                                                                                                              |
| Year of birth                                                                               | 1973                                                                                                                                                                                                                                                                                                                               |
| Scientist ID                                                                                | 238765                                                                                                                                                                                                                                                                                                                             |
| Research or art rank, and date of last rank appointment                                     | Science Adviser - 13.07.2012.                                                                                                                                                                                                                                                                                                      |
| Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment | Full professor 23.05. 2013.                                                                                                                                                                                                                                                                                                        |
| Area and field of election into research or art rank                                        | Biotechnical Sciences, Food Technology                                                                                                                                                                                                                                                                                             |
| <b>INFORMATION ON CURRENT EMPLOYMENT</b>                                                    |                                                                                                                                                                                                                                                                                                                                    |
| Institution where employed                                                                  | Faculty of Chemistry and Technology, University of Split                                                                                                                                                                                                                                                                           |
| Date of employment                                                                          | 1.01.2002.                                                                                                                                                                                                                                                                                                                         |
| Name of position (professor, researcher, associate teacher, etc.)                           | Professor                                                                                                                                                                                                                                                                                                                          |
| Field of research                                                                           | Food Science                                                                                                                                                                                                                                                                                                                       |
| Function                                                                                    | Full professor                                                                                                                                                                                                                                                                                                                     |
| <b>INFORMATION ON EDUCATION – Highest degree earned</b>                                     |                                                                                                                                                                                                                                                                                                                                    |
| Degree                                                                                      | Ph.D.                                                                                                                                                                                                                                                                                                                              |
| Institution                                                                                 | Faculty of Food Technology and Biotechnology, University of Zagreb                                                                                                                                                                                                                                                                 |
| Place                                                                                       | Zagreb                                                                                                                                                                                                                                                                                                                             |
| Date                                                                                        | 14.06.2004.                                                                                                                                                                                                                                                                                                                        |
| <b>INFORMATION ON ADDITIONAL TRAINING</b>                                                   |                                                                                                                                                                                                                                                                                                                                    |
| Year                                                                                        | 2000-2001<br>2002-2003<br>2006-2008<br>2016                                                                                                                                                                                                                                                                                        |
| Place                                                                                       | Paris, France<br>Fribourg, Switzerland<br>Freising, Germany<br>Regensburg, Germany<br>Barcelona, Spain                                                                                                                                                                                                                             |
| Institution                                                                                 | INRA, Institut National de la Recherche Agronomique<br>Faculty of Science, Department of Biology, University of Fribourg<br>Faculty of Food Science, Chair of Food Biofunctionality, Technical University of Munich (TUM)<br>Faculty of Chemistry, University of Regensburg<br>University of Barcelona, Faculty of Pharmacy, Spain |
| Field of training                                                                           | isolation and characterization of probiotic <i>Lactobacillus</i> species                                                                                                                                                                                                                                                           |

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|                                                                                                                                                       | from yogurth; isolation of phytochromes from model plant <i>Arabidopsis thaliana</i> ; biologically active compounds from sea fennel and caper; low melting sugars; biologically active compounds and their stability after <i>in vitro</i> digestion model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>MOTHER TONGUE AND FOREIGN LANGUAGES</b>                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Mother tongue                                                                                                                                         | Croatian                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)                                                      | English (4)<br>French (4)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>COMPETENCES FOR THE COURSE</b>                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme) | Hygiene and Sanitation: graduate study of Chemical Technology (2007 – today)<br>Introduction to Food Science: specialist study of Food Technology (2007 – today)<br>Mediterranean diet: graduate study of Chemical Technology (2012-today)<br>Dietetics: the study of Pharmacy (2012-today)<br>Diet of Elderly People: the study of Nutrition (2015-today)<br>Technology of Fruits and Vegatable Processing (2007-2015)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Authorship of university/faculty textbooks in the field of the course                                                                                 | Introduction to Food Science, revised teaching course, web pages of the Faculty of Chemistry and Technology, 2013<br>Dietetics, revised teaching course, web pages of the Faculty of Chemistry and Technology, 2013<br>Olive oil and health, book, publisher Kronomedia, 2015<br>Hygiene and Sanitation, revised teaching course, web page of the Faculty of Chemistry and Technology, 2016<br>Olive oil and health, book, publisher Kronomedia, Split, 2016,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)                           | Z. Fredotović, M. Šprung, B. Soldo, I. Ljubenković, I. Budić-Leto, T. Bilušić, V. Čikeš-Čulić, J. Puizina, J. (2017) Chemical composition and biological activity of <i>A. cepa</i> L. and <i>A. × cornutum</i> (Clementi ex Visiani 1842) methanolic extracts. <i>Molecules</i> , 22, 448-1-448-13.<br>Z. Zorić, J. Markić, S. Pedisić, V. Bučević-Popović, I. Generalić-Mekinić, K. Grebenar, T. Kulišić-Bilušić: Stability of rosmarinic acid in aqueous extracts from different Lamiaceae species after <i>in vitro</i> digestion with human gastrointestinal enzymes, <i>Food Technology and Biotechnology</i> , 54 (2016) 97-102.<br>D. Poljuha, I. Šola, J. Bilić, S. Dudaš, T. Bilušić, J. Markić, G. Rusak: Phenolic composition antioxidant capacity, energy content and gastrointestinal stability of Croatian wild edible plants, <i>European Food Research and Technology</i> , 241 (2015) 573-585.<br>V. Bučević-Popović, I. Delaš, S. Međugorac, M. Pavela-Vrančić, T. Kulišić-Bilušić: Oxidative stability and antioxidant activity of bovine, caprine, ovine and asinine milk. <i>International Journal of Dairy Technology</i> , 67 (2014) 394-401.<br>T. Kulisić-Bilusic, I. Schmöller, K. Schnäbele, L. Siracusa, G. Ruberto: The anticarcinogenic potential of essential oil and aqueous infusion from caper ( <i>Capparis spinosa</i> L.), <i>Food Chemistry</i> , 132 (2012) 261-267. |
| Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |



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| Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)                                                                                              | Phenolics, lipids and genetic profile of autochthonous olive cultivars – Oblica, Drobica, Buhavica and Levantinka after early and late harvest period, Split-Dalmatian County<br>The enhancement of the stability and bioavailability of selected phytochemicals using different delivery systems and mathematic modelling in in vitro digestion process, bilateral project Croatia-Serbia<br>The role of cholinesterases in cell differentiation and their inhibition by flavonoids and flavonoid-metal complexes, HRZZ; voditelj projekta: prof. dr. Herwig O. Gutzeit, University of Dresden, Germany<br>Antioxidants and inhibitors of AChE from aromatic plants, Ministry of Science, Republic of Croatia |
| The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoške kompetencije?                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>PRIZES AND AWARDS, STUDENT EVALUATION</b>                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Prizes and awards for teaching and scholarly/artistic work                                                                                                                                                         | The award for science of the University of Split, 2016.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated) |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

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|---------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| First and last name and title of teacher                                                    | <b>Ph. D. Ivica Blažević, Assistant Professor</b>                                                                                                                               |
| The course he/she teaches in the proposed study programme                                   | Spectroscopic methods in food analysis                                                                                                                                          |
| <b>GENERAL INFORMATION ON COURSE TEACHER</b>                                                |                                                                                                                                                                                 |
| Address                                                                                     | Rudera Boškovića 35, 21000 Split, Croatia                                                                                                                                       |
| Telephone number                                                                            | 00 385 (0) 21 329 434                                                                                                                                                           |
| E-mail address                                                                              | blazevic@ktf-split.hr                                                                                                                                                           |
| Personal web page                                                                           | <a href="https://www.ktf.unist.hr/index.php/ozk-3/zok/172-hrvatski/djelatnici/cv/164-cv36">https://www.ktf.unist.hr/index.php/ozk-3/zok/172-hrvatski/djelatnici/cv/164-cv36</a> |
| Year of birth                                                                               | 1974                                                                                                                                                                            |
| Scientist ID                                                                                | 267194                                                                                                                                                                          |
| Research or art rank, and date of last rank appointment                                     | Senior Research Associate, June 2015.                                                                                                                                           |
| Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment | Assistant professor, November 2012.                                                                                                                                             |
| Area and field of election into research or art rank                                        | Natural sciences, Chemistry                                                                                                                                                     |
| <b>INFORMATION ON CURRENT EMPLOYMENT</b>                                                    |                                                                                                                                                                                 |
| Institution where employed                                                                  | Faculty of Chemistry and Technology, University of Split                                                                                                                        |
| Date of employment                                                                          | 1. December 2003.                                                                                                                                                               |

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| Name of position (professor, researcher, associate teacher, etc.)                                                                                     | Assistant professor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Field of research                                                                                                                                     | Organic chemistry                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Function                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>INFORMATION ON EDUCATION – Highest degree earned</b>                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Degree                                                                                                                                                | Ph.D.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Institution                                                                                                                                           | University of Zagreb, Faculty of Sciences                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Place                                                                                                                                                 | Zagreb                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Date                                                                                                                                                  | 23. October, 2009.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>INFORMATION ON ADDITIONAL TRAINING</b>                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Year                                                                                                                                                  | 2002, 2003                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Place                                                                                                                                                 | Monza-Italy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Institution                                                                                                                                           | PerkinElmer referent center                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Field of training                                                                                                                                     | Chromatography, Mass spectrometry, Infrared, UV/Vis, Atomic and Inductivity coupled plasma optical emission spectroscopy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>MOTHER TONGUE AND FOREIGN LANGUAGES</b>                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Mother tongue                                                                                                                                         | Croatian                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)                                                      | English (5)<br>German (2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>COMPETENCES FOR THE COURSE</b>                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme) | Organic analysis (graduate study of Chemistry, orientation Organic chemistry and Biochemistry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Authorship of university/faculty textbooks in the field of the course                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)                           | <p>I. Generalić Mekinić, I. Blažević, I. Mudnić, F. Burčul, M. Grga, D. Skroza, I. Jerčić, I. Ljubenkov, M. Boban, M. Miloš, V. Katalinić: Sea Fennel (<i>Crithmum maritimum</i> L.): Phytochemical Profile, Antioxidative, Cholinesterase Inhibitory and Vasodilatory Activity. Journal of food science and technology. 53 (2016) 7, 3104-3112</p> <p>I. Blažević, S. Montaut, G. Rosalinda De Nicola, P. Rollin: Long-chain Glucosinolates from <i>Arabis turrita</i>: Enzymatic and Non-enzymatic Degradations. Natural product communications. 10 (2015) 6, 1043-1046.</p> <p>I. Blažević, T. Maleš, M. Ruščić: Glucosinolates of <i>Lunaria annua</i>: Thermal, enzymatic, and chemical degradation, Chemistry of natural compounds. 49 (2014) 6, 1154-1157.</p> <p>I. Blažević, F. Burčul, M. Ruščić, J. Mastelić: Glucosinolates, volatile constituents, and acetylcholinesterase inhibitory activity of <i>Alyssoides utriculata</i>, Chemistry of natural compounds. 49 (2013) 2, 374-378.</p> <p>I. Blažević, G. Rosalinda De Nicola, S. Montaut, P. Rollin: Glucosinolates in Two Endemic Plants of the <i>Aurinia</i> Genus and their Chemotaxonomic Significance, Natural product communications. 8 (2013) 10, 1463-1466.</p> |
| Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Professional, science and artistic                                                                                                                    | Project leader (2017.-2021.): Croatian Science Foundation (IP-                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

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| projects in the field of the course carried out in the last five years (5 at most)                                                                                                                                 | 06-2016-1316): "Plants as a source of bioactive sulphur compounds and their ability to hyperaccumulate metals"<br>Project co-worker (2016.-2017.): Bilateral Croatian-Serbian project "Enhancement of the stability and the bioavailability of selected phytochemicals using different delivery systems and mathematical modeling of an <i>in vitro</i> digestion model." Ministry of Science and Education. (Project leader: Dr. T. Bilušić, full prof.)<br>Project leader (2013.–2014): Bilateral Croatian-French project COGITO "Glucosinolates: novel sources and biological potential" |
| The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>PRIZES AND AWARDS, STUDENT EVALUATION</b>                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Prizes and awards for teaching and scholarly/artistic work                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated) | Average grade 4.9 – 5.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

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| First and last name and title of teacher                                                    | <b>Ph. D. Dragan Bubalo, Associated Professor</b>                                                                               |
| The course he/she teaches in the proposed study programme                                   | Honey and Other Bee Products                                                                                                    |
| <b>GENERAL INFORMATION ON COURSE TEACHER</b>                                                |                                                                                                                                 |
| Address                                                                                     | Svetošimunska cesta 25                                                                                                          |
| Telephone number                                                                            | 01/239 39 77                                                                                                                    |
| E-mail address                                                                              | dbubalo@agr.hr                                                                                                                  |
| Personal web page                                                                           | <a href="http://www.agr.unizg.hr/en/address-book/65/dragan-bubalo">http://www.agr.unizg.hr/en/address-book/65/dragan-bubalo</a> |
| Year of birth                                                                               | 1963.                                                                                                                           |
| Scientist ID                                                                                | 200480                                                                                                                          |
| Research or art rank, and date of last rank appointment                                     | Scientific adviser, January 2011.                                                                                               |
| Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment | Associated Professor, March 2016.                                                                                               |
| Area and field of election into research or art rank                                        | Biotechnical sciences, Agriculture                                                                                              |
| <b>INFORMATION ON CURRENT EMPLOYMENT</b>                                                    |                                                                                                                                 |
| Institution where employed                                                                  | Faculty of agriculture                                                                                                          |
| Date of employment                                                                          | 1. 8. 1991.                                                                                                                     |
| Name of position (professor, researcher, associate teacher, etc.)                           | Professor                                                                                                                       |
| Field of research                                                                           | Apiculture                                                                                                                      |
| Function                                                                                    |                                                                                                                                 |
| <b>INFORMATION ON EDUCATION – Highest degree earned</b>                                     |                                                                                                                                 |

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| Degree                                                                                                                                                | Ph.D.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Institution                                                                                                                                           | Faculty of agriculture                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Place                                                                                                                                                 | Zagreb                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Date                                                                                                                                                  | 21. 10. 1999.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>INFORMATION ON ADDITIONAL TRAINING</b>                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Year                                                                                                                                                  | 1993.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Place                                                                                                                                                 | Lunz am See, Austrija                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Institution                                                                                                                                           | Institut für Bienenkunde, Abteilung Bienenzüchtung                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Field of training                                                                                                                                     | Biology of honey bee colony                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Year                                                                                                                                                  | 1995.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Place                                                                                                                                                 | Lunz am See, Austrija                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Institution                                                                                                                                           | Institut für Bienenkunde, Abteilung Bienenzüchtung                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Field of training                                                                                                                                     | Biology of honey bee colony                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Year                                                                                                                                                  | 1995.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Place                                                                                                                                                 | Lunz am See, Austrija                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Institution                                                                                                                                           | Institut für Bienenkunde, Abteilung Bienenzüchtung                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Field of training                                                                                                                                     | Biology and pathology of honey bees                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Year                                                                                                                                                  | 2001.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Place                                                                                                                                                 | Perugia, Italija                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Institution                                                                                                                                           | University of Perugia, Faculty of agriculture institute, Agricultural entomology institute                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Field of training                                                                                                                                     | Melissopalynology                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Year                                                                                                                                                  | 2011.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Place                                                                                                                                                 | Hohenheim, Njemačka                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Institution                                                                                                                                           | University of Hohenheim/Apicultural State Institute                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Field of training                                                                                                                                     | Honey and beeswax analytics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>MOTHER TONGUE AND FOREIGN LANGUAGES</b>                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Mother tongue                                                                                                                                         | Croatian                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)                                                      | English (4)<br>Italian (2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>COMPETENCES FOR THE COURSE</b>                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme) |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Authorship of university/faculty textbooks in the field of the course                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)                           | <p>I. Jerković, S. Prđun, Z. Marijanović, M. Zekić, D. Bubalo, L. Svečnjak, C. I. G. Tuberoso: Traceability of Satsuma Mandarin (<i>Citrus unshiu</i> Marc.) Honey through Nectar/Honey-Sac/Honey Pathways of the Headspace, Volatiles, and Semi-Volatiles: Chemical Markers. <i>Molecules</i>. 21 (2016) 10, 1-13.</p> <p>I. Flanjak, D. Kenjeric, D. Bubalo, Lj. Primorac: Characterisation of selected Croatian honey types based on the combination of antioxidant capacity, quality parameters and chemometrics. <i>European Food Research and Technology</i>. 242 (2016) 4, 467-475.</p> <p>L. Svečnjak, D. Bubalo, G. Baranović, H. Novosel: Optimization of FTIR-ATR spectroscopy for botanical authentication of unifloral honey types and melissopalynological data prediction. <i>European food research and technology</i>, 240 (2015), 6 1101-1115.</p> <p>L. Svečnjak, G. Baranović, M. Vinceković, S. Prđun, D. Bubalo,</p> |

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|                                                                                                                                                                                                                    | I. Tlak Gajger: An approach for routine analytical detection of bees wax adulteration using FTIR-ATR spectroscopy. Journal of Apicultural Science, 59 (2015) 2, 46-58.<br>C. I. G. Tuberoso, I. Jerkovic, E. Bifulco, Z. Marijanović, F. Congiu, D. Bubalo: Riboflavin and lumichrome in Dalmatian sage honey and other unifloral honeys determined by LC-DAD technique. Food Chemistry, 135 (2012) 3, 1985-1990. |
| Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)                                                                                              | Palynological characteristics of nectar and honey of sage ( <i>Salvia officinalis</i> ) (028-0000000-3178) funding Ministry of Science, Education and Sports from 2008. till 2013. (leader)                                                                                                                                                                                                                       |
| The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?                                            |                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>PRIZES AND AWARDS, STUDENT EVALUATION</b>                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Prizes and awards for teaching and scholarly/artistic work                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated) | Honey and other bee products summer semester 2014/2015., score 4.50.                                                                                                                                                                                                                                                                                                                                              |

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| First and last name and title of teacher                                                    | <b>Ph. D. Irena Budić-Leto, Assistant Professor</b>                                                             |
| The course he/she teaches in the proposed study programme                                   | Wine Technology, Sensory Evaluation of Food                                                                     |
| <b>GENERAL INFORMATION ON COURSE TEACHER</b>                                                |                                                                                                                 |
| Address                                                                                     | Domovinskog rata 58, 21000 Split                                                                                |
| Telephone number                                                                            | +385 98 17 33 862                                                                                               |
| E-mail address                                                                              | irena@krs.hr                                                                                                    |
| Personal web page                                                                           | <a href="http://www.krs.hr/en/about/staff/personal/irena/">http://www.krs.hr/en/about/staff/personal/irena/</a> |
| Year of birth                                                                               | 1969                                                                                                            |
| Scientist ID                                                                                | 239531                                                                                                          |
| Research or art rank, and date of last rank appointment                                     | Senior research scientist, June 2012                                                                            |
| Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment | Assistant professor 2013                                                                                        |
| Area and field of election into research or art rank                                        | Biotechnical sciences, Food technology                                                                          |
| <b>INFORMATION ON CURRENT EMPLOYMENT</b>                                                    |                                                                                                                 |
| Institution where employed                                                                  | Institute for Adriatic Crops and Karst Reclamation                                                              |
| Date of employment                                                                          | 29.03.1996.                                                                                                     |

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| Name of position (professor, researcher, associate teacher, etc.)                                                                                     | Senior research scientist                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Field of research                                                                                                                                     | Wine technology, chemistry of grape and wine, sensory analysis of wine                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Function                                                                                                                                              | Head of Enological laboratory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>INFORMATION ON EDUCATION – Highest degree earned</b>                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Degree                                                                                                                                                | PhD Biotechnical sciences                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Institution                                                                                                                                           | Faculty of Food technology and Biotechnology                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Place                                                                                                                                                 | Zagreb                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Date                                                                                                                                                  | 14 <sup>th</sup> November 2003                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>INFORMATION ON ADDITIONAL TRAINING</b>                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Year                                                                                                                                                  | 2002, 2009, 2017                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Place                                                                                                                                                 | San Michele all'Adige, Italy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Institution                                                                                                                                           | Fondazione Edmund Mach, Research and Innovation Centre, Food Quality and Nutrition Department                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Field of training                                                                                                                                     | Polyphenol analysis by HPLC, metabolomics analysis                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Year                                                                                                                                                  | 2010                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Place                                                                                                                                                 | Zagreb                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Institution                                                                                                                                           | Agricultural faculty                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Field of training                                                                                                                                     | Sensory evaluation of wine                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Year                                                                                                                                                  | 2001                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Place                                                                                                                                                 | Ljubljana                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Institution                                                                                                                                           | Slovenian Institute of Agriculture                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Field of training                                                                                                                                     | Spectrophotometric methods of polyphenol analysis                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>MOTHER TONGUE AND FOREIGN LANGUAGES</b>                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Mother tongue                                                                                                                                         | Croatian                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)                                                      | English (4)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>COMPETENCES FOR THE COURSE</b>                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme) | <p>The use of genetic resources of Mediterranean plants: Interdisciplinary Doctoral Study Molecular Biosciences (from 2016.)</p> <p>Processing of grapes: postgraduate study, Chemical technology: Mediterranean crops, Faculty of Chemical technology (2015/2016), (lectures)</p> <p>Enology (2009-2015) inter-university undergraduate study Mediterranean agriculture (University of Zagreb Faculty of Agriculture; University of Split and Institute for Adriatic Crops and Karst Reclamation, Split) (lectures, exercises)</p> <p>Introduction to technology of grape brandy and Cognac: (2010-2015) inter-university undergraduate study Mediterranean agriculture (lectures, exercises)</p> |
| Authorship of university/faculty textbooks in the field of the course                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)                           | <p>I. Lukić, I. Budić-Leto, M. Bubola, K. Damijanić, M. Staver: Pre-fermentative cold maceration, saignée, and various thermal treatments as options for modulating volatile aroma and phenol profiles of red wine, Food Chemistry, 224 (2017) 251–261.</p> <p>G. Zdunić, E. Maul, K. Hančević, M. Leko, L. Butorac, A. Mucalo, T. Radić, S. Šimon, I. Budić-Leto, M. Žulj Mihaljević, E. Maletić: Genetic Diversity of Wild Grapevine (<i>Vitis vinifera</i> subsp. <i>sylvestris</i> Gmel Hegi) in the Eastern Adriatic Region, American Journal of Enology and Viticulture. (2017) DOI: 10.5344/ajev.2016.1607.</p>                                                                             |

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|                                                                                                                                                                                                                    | <p>I. Budić-Leto, I. Humar, G. Zdunić, J. Hribar, Z. Zlatić: Volatile compounds in Prošek Dessert wines produced from white and red grapes, Czech Journal of Food Sciences, 33 (2015) 4, 354-360.</p> <p>G. Zdunić, A. Mucalo, I. Budić-Leto, I. Humar, I. Pejić, E. Maletić: Cluster architecture of old, neglected Croatian grape vine cultivars (<i>Vitis vinifera</i> L.), Vitis, 5 (2015) 177-180.</p> <p>A. Mucalo, G. Zdunić, F. Will, I. Budić-Leto, I. Pejić, E. Maletić: Changes in anthocyanin and berry color of 'Plavac mali' grape during ripening, Mitteilungen Klosterneuburg, 65 (2015) 130-142.</p>                                                                                                                                                                                                      |
| Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)                                                                                              | <p>2015-2018 The wild grape (<i>Vitis vinifera</i> subsp. <i>sylvestris</i>): a valuable source of genes for grapevine breeding, Support: Croatian Science Foundation</p> <p>2015-2018 Unravelling the varietal TYPicity of wines and olive oils from CROatian native varieties – TYPICRO, Support: Croatian Science Foundation</p> <p>2014-2018 COST FA 1403 Interindividual variation in response to consumption of plant food bioactives and determinants involved POSITIVE)</p> <p>2013-2015 Conservation of wild grapevine (<i>Vitis vinifera</i> L. subsp. <i>sylvestris</i>) in Bosnia and Herzegovina, Support: Critical Ecosystem Partnership Fund (CEPF)</p> <p>2007-2013 Biotechnological Parameters of Premium-quality Dalmatian Dessert Wine – Prošek, Support: Ministry of Science, Education and Sports</p> |
| The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>PRIZES AND AWARDS, STUDENT EVALUATION</b>                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Prizes and awards for teaching and scholarly/artistic work                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated) |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

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|-----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| First and last name and title of teacher                  | <b>Ph. D. Ivana Generalić Mekinić, Assistant Professor</b>                                                                                                                                 |
| The course he/she teaches in the proposed study programme | Novel Food Processing Technologies, Alcoholic Beverages Technology, Novel Fruit and Vegetable Products, Functional Foods and Nutraceuticals, Citrus Processing, Ecological Food Production |



| GENERAL INFORMATION ON COURSE TEACHER                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| Address                                                                                                                                               | Ruđera Boškovića 33, 21000 Split                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Telephone number                                                                                                                                      | + 385 21/329 458                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| E-mail address                                                                                                                                        | gene@ktf-split.hr                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Personal web page                                                                                                                                     | <a href="https://tkojetko.irb.hr/znanstvenikDetalji.php?sifznan=20205">https://tkojetko.irb.hr/znanstvenikDetalji.php?sifznan=20205</a>                                                                                                                                                                                                                                                                                                                                                        |
| Year of birth                                                                                                                                         | 1984.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Scientist ID                                                                                                                                          | 298955                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Research or art rank, and date of last rank appointment                                                                                               | Senior Research Associate, January 2017.                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment                                                           | Assistant professor, October 2014.                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Area and field of election into research or art rank                                                                                                  | Biotechnical Sciences, Food Technology                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| INFORMATION ON CURRENT EMPLOYMENT                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Institution where employed                                                                                                                            | Faculty of Chemistry and Technology, University of Split                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Date of employment                                                                                                                                    | 01.11.2007.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Name of position (professor, researcher, associate teacher, etc.)                                                                                     | Assistant professor                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Field of research                                                                                                                                     | Teaching, Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Function                                                                                                                                              | Assistant professor, researcher                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| INFORMATION ON EDUCATION – Highest degree earned                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Degree                                                                                                                                                | Ph.D.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Institution                                                                                                                                           | Faculty of Food Technology and Biotechnology, University of Zagreb                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Place                                                                                                                                                 | Zagreb                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Date                                                                                                                                                  | 12.10.2012.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| INFORMATION ON ADDITIONAL TRAINING                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Year                                                                                                                                                  | 2009/2010                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Place                                                                                                                                                 | Ljubljana, Slovenia                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Institution                                                                                                                                           | Biotechnical Faculty, University of Ljubljana                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Field of training                                                                                                                                     | Food chemistry and microbiology                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| MOTHER TONGUE AND FOREIGN LANGUAGES                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Mother tongue                                                                                                                                         | Croatian                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)                                                      | English (5)<br>German (3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| COMPETENCES FOR THE COURSE                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme) | Teacher and practice assistant of several courses: Chemistry and technology of grape and wine; Single Processes in Food Industry, Grape Processing, Olive Processing (Graduate level); and Single Processes in Food Industry, Grape Processing, Olive Processing (Undergraduate level)<br>Teacher on courses Technology of Mediterranean fruit and vegetable (2015/2016); Grape Processing (2015-2017); Processes in Food Industry (2015-2017); Introduction to Food Technologies (2015-2016). |
| Authorship of university/faculty textbooks in the field of the course                                                                                 | Laboratory practice handbooks: „Grape Processing “ and "Technology of the Mediterranean fruit and vegetable"                                                                                                                                                                                                                                                                                                                                                                                   |
| Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)                           | I. Bikić, S. Svilović, M. Banović, M. Bocevska, V. Katalinić: Anthocyanidins in Babica, Ljutun and Crljenak Kaštelanski grapes and kinetic of their degradation under different storage conditions. Journal of Food and Nutrition Research. 55 (2016) 294-302.                                                                                                                                                                                                                                 |

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|                                                                                                                                                                                                 | <p>I. Generalić Mekinić, D. Skroza, I. Ljubenov, V. Katalinić: Insight into the presence of stilbenes in medicinal plants traditionally used in Croatian folk medicine. <i>Natural Product Communications</i>. 11 (2016) 833-835.</p> <p>I. Generalić Mekinić, I. Blažević, I. Mudnić, F. Burčul, M. Grga, D. Skroza, I. Jerčić, I. Ljubenkov, M. Boban, M. Miloš, V. Katalinić: Sea Fennel (<i>Crithmum maritimum</i> L.): Phytochemical Profile, Antioxidative, Cholinesterase Inhibitory and Vasodilatory Activity. <i>Journal of Food Science and Technology</i>. 53 (2016) 7, 3104-3112.</p> <p>D. Skroza, I. Generalić Mekinić, S. Svilović, V. Šimat, V. Katalinić: Investigation of the potential synergistic effect of resveratrol with other phenolic compounds: A case of binary phenolic mixtures. <i>Journal of Food Composition and Analysis</i>. 38 (2015) 13-18.</p> <p>I. Mudnić, D. Budimir, D. Modun, G. Gunjača, I. Generalić, D. Skroza, V. Katalinić, I. Ljubenkov, M. Boban: Antioxidant and vasodilatory effects of blackberry and grape wines. <i>Journal of Medicinal Food</i>. 15 (2012) 3, 315-321.</p> |
| Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)                                                                           | <p>Croatian Science Foundation (IP-06-2016) BioSMe "Plants as a source of bioactive sulphur compounds and their ability to hyperaccumulate metals" (2017-2021). Project leader: Doc.dr.sc. I. Blažević.</p> <p>Croatian Science Foundation (IP-09-2014) BioActCom "Investigation of bioactive compounds from Dalmatian plants: Their antioxidant, enzyme inhibition and health properties" (2015-2019). Project leader: Prof.dr.sc. M. Miloš.</p> <p>Bilateral project " Glucosinolates: novel sources and biological potential" (Croatia-France) (2013-2015): Project leader: Doc.dr.sc. I. Blažević.</p> <p>Bilateral project "Effect of medicinal plant phenolic extracts on the stability of grape antocyanins" (Croatia-Macedonia) (2012-2014) (Project leader: Prof.dr.sc. V. Katalinić).</p> <p>International education project "Improvement Academia-Industry Link sin Food Safety and Quality" 158714-TEMPUS-1-2009-1-ES-TEMPUS-JPHE</p>                                                                                                                                                                                   |
| The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoške kompetencije? |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>PRIZES AND AWARDS, STUDENT EVALUATION</b>                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Prizes and awards for teaching and scholarly/artistic work                                                                                                                                      | <p>2011.- Biotechnical support, Faculty of Food Technology and Biotechnology, Zagreb</p> <p>2011.- Faculty of Chemistry and Technology reward for young scientist</p> <p>2010.- CEFood 2010 Congress, Bratislava- Award for the best oral presentation in the category of the young scientist section</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Results of student evaluation taken in the last five years for the course                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

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| that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated) |  |
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| First and last name and title of teacher                                                                                             | <b>Ph. D. Senka Gudić, Full Professor</b>                                                                                                                                                                                                 |
| The course he/she teaches in the proposed study programme                                                                            | Corrosion and Materials Pprotection                                                                                                                                                                                                       |
| <b>GENERAL INFORMATION ON COURSE TEACHER</b>                                                                                         |                                                                                                                                                                                                                                           |
| Address                                                                                                                              | Ruđera Boškovića 35, 21000 Split                                                                                                                                                                                                          |
| Telephone number                                                                                                                     | ++385 21 329 433                                                                                                                                                                                                                          |
| E-mail address                                                                                                                       | senka@ktf-split.hr                                                                                                                                                                                                                        |
| Personal web page                                                                                                                    | <a href="https://www.ktf.unist.hr/index.php/obavijesti-2/obavijesti-poslijediplomski-studij/172-djelatnici/cv/183-cv55">https://www.ktf.unist.hr/index.php/obavijesti-2/obavijesti-poslijediplomski-studij/172-djelatnici/cv/183-cv55</a> |
| Year of birth                                                                                                                        | 1965.                                                                                                                                                                                                                                     |
| Scientist ID                                                                                                                         | 181062                                                                                                                                                                                                                                    |
| Research or art rank, and date of last rank appointment                                                                              | Senior Research Scientist, May 2009.                                                                                                                                                                                                      |
| Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment                                          | Full Professor, July 2011.                                                                                                                                                                                                                |
| Area and field of election into research or art rank                                                                                 | Technical Sciences, Chemical Engineering                                                                                                                                                                                                  |
| <b>INFORMATION ON CURRENT EMPLOYMENT</b>                                                                                             |                                                                                                                                                                                                                                           |
| Institution where employed                                                                                                           | Faculty of Chemistry and Technology, University of Split                                                                                                                                                                                  |
| Date of employment                                                                                                                   | November 2 <sup>nd</sup> , 1990.                                                                                                                                                                                                          |
| Name of position (professor, researcher, associate teacher, etc.)                                                                    | Full Professor                                                                                                                                                                                                                            |
| Field of research                                                                                                                    | Analysis, synthesis and management of chemical processes                                                                                                                                                                                  |
| Function                                                                                                                             |                                                                                                                                                                                                                                           |
| <b>INFORMATION ON EDUCATION – Highest degree earned</b>                                                                              |                                                                                                                                                                                                                                           |
| Degree                                                                                                                               | PhD                                                                                                                                                                                                                                       |
| Institution                                                                                                                          | Faculty of Chemistry and Technology, University of Split                                                                                                                                                                                  |
| Place                                                                                                                                | Split                                                                                                                                                                                                                                     |
| Date                                                                                                                                 | June 21 <sup>st</sup> , 2000.                                                                                                                                                                                                             |
| <b>INFORMATION ON ADDITIONAL TRAINING</b>                                                                                            |                                                                                                                                                                                                                                           |
| Year                                                                                                                                 |                                                                                                                                                                                                                                           |
| Place                                                                                                                                |                                                                                                                                                                                                                                           |
| Institution                                                                                                                          |                                                                                                                                                                                                                                           |
| Field of training                                                                                                                    |                                                                                                                                                                                                                                           |
| <b>MOTHER TONGUE AND FOREIGN LANGUAGES</b>                                                                                           |                                                                                                                                                                                                                                           |
| Mother tongue                                                                                                                        | Croatian                                                                                                                                                                                                                                  |
| Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)                                     | English (4)                                                                                                                                                                                                                               |
| <b>COMPETENCES FOR THE COURSE</b>                                                                                                    |                                                                                                                                                                                                                                           |
| Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of | Electrochemical methods and their application, Corrosion inhibitors, Direct energy conversion – graduated study of Chemical Technology (orientation: Materials)<br>Electrochemistry, Chemical sources of energy –undergraduate            |

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| study programme)                                                                                                                                                                                                   | study of Chemical Technology (orientation: Chemical Engineering)<br>Electrochemical engineering, Direct energy conversion – professional study of Chemical Technology (orientation: Chemical Technology and Materials)<br>Electrochemical engineering, Corrosion inhibitors – postgraduate doctoral study Chemical Engineering in Materials Development and Environmental Protection                                                                                                                                                                                                                                                                                                                                                |
| Authorship of university/faculty textbooks in the field of the course                                                                                                                                              | S. Gudić, Elektrokemijski izvori struje, KTF-Split, 2011.<br>S. Gudić, Inhibitori korozije metala, KTF-Split, 2006.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)                                                                                        | S. Gudić, L. Vrsalović, M. Kliškić, A. Radonić, M. Zekić, I. Jerković: Corrosion inhibition of AA 5052 aluminium alloy in 0.5 M NaCl solution by different types of honey, Int. J. Electrochem. Sci. 11 (2016) 998-1011.<br>L. Vrsalović, S. Gudić, M. Kliškić, E. Oguzie, L. Carev: Inhibition of Copper Corrosion in NaCl Solution by Caffeic Acid, Int. J. Electrochem. Sci. 11 (2015) 459-474.<br>S. Gudić, A. Radonić, E.E. Oguzie, L. Vrsalović, I. Smoljko, M. Kliškić: Cofeine as corrosion inhibitor for Cu in NaCl solution, Maced. J. Chem. Chem. Eng. 33 (2014) 13-25.<br>I. Smoljko, S. Gudić, N. Kuzmanić, M. Kliškić: Anodic behaviour of aluminium alloys in NaCl solution, J. App. Electrochem. 42 (2012) 969-977. |
| Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)                                                                                              | Project Associate HRZZ-IP-11-2013-8547: Research of Natural Products and Flavours: Chemical Fingerprinting and Unlocking the Potential (NaPro-Flav), 2014-2019.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoške kompetencije?                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>PRIZES AND AWARDS, STUDENT EVALUATION</b>                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Prizes and awards for teaching and scholarly/artistic work                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated) |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

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|-----------------------------------------------------------|--------------------------------------------------|
| First and last name and title of teacher                  | <b>Ph. D. Mladen Hraste, Assistant Professor</b> |
| The course he/she teaches in the proposed study programme | Kinesiological Activity, Fitness and Health      |
| <b>GENERAL INFORMATION ON COURSE TEACHER</b>              |                                                  |

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| Address                                                                                                                                               | Jobova 28                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Telephone number                                                                                                                                      | 021385178                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| E-mail address                                                                                                                                        | mharste@pmfst.hr                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Personal web page                                                                                                                                     | <a href="http://www.pmfst.hr/~mhraste/">http://www.pmfst.hr/~mhraste/</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Year of birth                                                                                                                                         | 14. 12. 1963.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Scientist ID                                                                                                                                          | 210025                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Research or art rank, and date of last rank appointment                                                                                               | Higher scientific associate, 21.10.2016.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment                                                           | Assistant professor, 30. 3. 2011.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Area and field of election into research or art rank                                                                                                  | Social Sciences, Kinesiology                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>INFORMATION ON CURRENT EMPLOYMENT</b>                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Institution where employed                                                                                                                            | Faculty of science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Date of employment                                                                                                                                    | 15. 12. 1995.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Name of position (professor, researcher, associate teacher, etc.)                                                                                     | Associate teacher                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Field of research                                                                                                                                     | Teaching and scientific research                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Function                                                                                                                                              | Teacher                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>INFORMATION ON EDUCATION – Highest degree earned</b>                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Degree                                                                                                                                                | PhD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Institution                                                                                                                                           | Faculty of Kinesiology                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Place                                                                                                                                                 | Split                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Date                                                                                                                                                  | 12. 7. 2010.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>INFORMATION ON ADDITIONAL TRAINING</b>                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Year                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Place                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Institution                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Field of training                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>MOTHER TONGUE AND FOREIGN LANGUAGES</b>                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Mother tongue                                                                                                                                         | Croatian                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)                                                      | English (4)<br>Italian (5)<br>Spanish (2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>COMPETENCES FOR THE COURSE</b>                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme) | Physical activity, fitness and health. Graduate study biology-chemistry, physics and mathematics-physics at the faculty of science, University of Split.                                                                                                                                                                                                                                                                                                                                                                                           |
| Authorship of university/faculty textbooks in the field of the course                                                                                 | The script Physical activity, fitness and health                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)                           | M. Hraste, N. Đurović, D. Rebić: Differences between boys and girls in the biotic motoric skills. Zbornik radova V. međunarodne konferencije Unapređenje kvalitete života djece i mladih, Split, (2013) 121-127.<br>M. Hraste, N. Đurović, J. Pleić: Correlation between physical activity and biotic motor skills. Zbornik radova V. međunarodne konferencije Unapređenje kvalitete života djece i mladih, Split, (2013) 887-893.<br>M. Hraste, M. Marković, I. Jelaska: Razlike u kineziološko-zdravstvenoj anamnezi i stavovima studenata prema |

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|                                                                                                                                                                                                                    | kineziološkim aktivnostima. Zbornik radova 23. ljetne škole kineziologa Republike Hrvatske, Poreč, 2014.<br>I. Granić, M. Hraste, M. Marković: Razlike u interesima studenata prema kineziološkim aktivnostima. Zbornik radova 23. ljetne škole kineziologa Republike Hrvatske, Poreč, 2014.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)                                                                    | M. Hraste, N. Đurović, D. Rebić: Differences between boys and girls in the biotic motoric skills. Zbornik radova V. međunarodne konferencije Unapređenje kvalitete života djece i mladih, Split, (2013) 121-127.<br>M. Hraste, N. Đurović, J. Pleić: Correlation between physical activity and biotic motor skills. Zbornik radova V. međunarodne konferencije Unapređenje kvalitete života djece i mladih, Split, (2013) 887-893.<br>M. Hraste, M. Marković, I. Jelaska: Razlike u kineziološko-zdravstvenoj anamnezi i stavovima studenata prema kineziološkim aktivnostima. Zbornik radova 23. ljetne škole kineziologa Republike Hrvatske, Poreč, 2014.<br>I. Granić, M. Hraste, M. Marković: Razlike u interesima studenata prema kineziološkim aktivnostima. Zbornik radova 23. ljetne škole kineziologa Republike Hrvatske, Poreč, 2014. |
| Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoškekompetencije?                     | Graduate study at the Faculty of Kinesiology, University of Split.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>PRIZES AND AWARDS, STUDENT EVALUATION</b>                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Prizes and awards for teaching and scholarly/artistic work                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated) | Global Index + - av.=4,8 dev.=0,4 1<br>Questions about the quality of teachers + - av.=4,9 dev.=0,3 1<br>Issues important to assess the quality of teaching + - av.=4,8 dev.=0,5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

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|-----------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| First and last name and title of teacher                  | <b>Dr. Igor Jerković, Full profesor</b>                                                               |
| The course he/she teaches in the proposed study programme | Flavour Chemistry, Processing Technology of Species and Medicinal Herbs, Honey and Other Bee Products |
| <b>GENERAL INFORMATION ON COURSE TEACHER</b>              |                                                                                                       |
| Address                                                   | Ruđera Boškovića 35, 21000 Split                                                                      |
| Telephone number                                          | 00385 21 329 436                                                                                      |
| E-mail address                                            | igor@ktf-split.hr                                                                                     |
| Personal web page                                         | -                                                                                                     |
| Year of birth                                             | 1975                                                                                                  |
| Scientist ID                                              | 226253                                                                                                |
| Research or art rank, and date of last rank appointment   | Research adviser, February 2011                                                                       |



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| Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment                                                           | Full professor, December 2012                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Area and field of election into research or art rank                                                                                                  | scientific area of natural sciences, scientific filed chemistry                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>INFORMATION ON CURRENT EMPLOYMENT</b>                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Institution where employed                                                                                                                            | Faculty of Chemistry and Technology, University of Split                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Date of employment                                                                                                                                    | 01 September 1998                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Name of position (professor, researcher, associate teacher, etc.)                                                                                     | full professor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Field of research                                                                                                                                     | natural organic compounds                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Function                                                                                                                                              | dean                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>INFORMATION ON EDUCATION – Highest degree earned</b>                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Degree                                                                                                                                                | Ph. D. (chemistry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Institution                                                                                                                                           | Faculty of Chemistry and Technology, University of Split                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Place                                                                                                                                                 | Split                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Date                                                                                                                                                  | 28 May 2004                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>INFORMATION ON ADDITIONAL TRAINING</b>                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Year                                                                                                                                                  | 2005 (three months); (2010.-2015. occasionally)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Place                                                                                                                                                 | Rome and Cagliari, Italy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Institution                                                                                                                                           | Universita degli studi di Roma „La Sapienza“ and Universita degli studi di Cagliari, Italia                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Field of training                                                                                                                                     | natural organic compounds                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>MOTHER TONGUE AND FOREIGN LANGUAGES</b>                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Mother tongue                                                                                                                                         | Croatian                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)                                                      | English (5)<br>Italian (3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>COMPETENCES FOR THE COURSE</b>                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme) | Chemistry and technology of aromatic plants (graduate study in Chemistry), Flavour chemistry (graduate study in chemistry)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Authorship of university/faculty textbooks in the field of the course                                                                                 | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)                           | <p>S. Jokić, I. Jerković, M. Rajić, K. Aladić, M. Bilić and S. Vidović, SC-CO<sub>2</sub> extraction of Vitex agnus-castus L. fruits: the influence of pressure, temperature and water presoaking on the yield and GC-MS profiles of the extracts in comparison to the essential oil composition, <i>Journal of Supercritical Fluids</i> 123 (2017) 50-57.</p> <p>I. Jerković, J. Družić, Z. Marijanović, M. Gugić, S. Jokić and M. Roje, GC-FID/MS Profiling of Supercritical CO<sub>2</sub> Extracts of Peels from <i>Citrus aurantium</i>, <i>C. sinensis</i> cv. Washington navel, <i>C. sinensis</i> cv. Tarocco and <i>C. sinensis</i> cv. Doppio Sanguigno from Dubrovnik Area (Croatia), <i>Natural Product Communications</i> 10 (2015) 1315-1318.</p> <p>P. M. Kuš, Z. Marijanović and I. Jerković, Evaluation of HS-SPME and ultrasonic solvent extraction for monitoring of plant flavours added by the bees to herbhoney: traceability biomarkers, <i>Food Additives and Contaminants</i> 32 (2015) 1761-1771.</p> |



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|                                                                                                                                                                                                                    | I. Jerković and P. M. Kuš, Terpenes in Honey: Occurrence, Origin and Their Role as Chemical Biomarkers, <i>RSC Advances</i> 4 (2014) 31710-31728.<br>I. Jerković, M. Marasović, Z. Marijanović, K. Hazler Pilepić, Ž. Maleš and M. Miloš, Chemical Composition of <i>Hypericum richeri</i> subsp. <i>grisebachii</i> Essential Oil from Croatia, <i>Natural Product Communications</i> 8 (2013) 231-233.                                      |
| Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)                                                                    | -                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)                                                                                              | Leader of research project HRZZ-IP-11-2013-8547: <i>Research of Natural Products and Flavours: Chemical Fingerprinting and Unlocking the Potential (NaPro-Flav)</i> , Croatian Science Foundation (01 June 2014. -)                                                                                                                                                                                                                           |
| The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoške kompetencije?                    | -                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>PRIZES AND AWARDS, STUDENT EVALUATION</b>                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Prizes and awards for teaching and scholarly/artistic work                                                                                                                                                         | The award for scientific achievement, "Ruđer Bošković", University of Split on November 29, 2013.<br>The award for special achievements in scientific and educational work, Faculty of Chemical Technology in Split, October 22, 2011.<br>The "Leopold (Lavoslav) Ružička" Award of Croatian Chemical Society for young scientists for outstanding results achieved in the field of chemistry of natural compounds, Zagreb, October 19, 2006. |
| Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated) |                                                                                                                                                                                                                                                                                                                                                                                                                                               |

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| First and last name and title of teacher                  | <b>Ph. D. Mirjana M. Kovač, Assistant Professor</b> |
| The course he/she teaches in the proposed study programme | Communication Skills                                |
| <b>GENERAL INFORMATION ON COURSE TEACHER</b>              |                                                     |
| Address                                                   | Put sv. Lovre 35, 21215 Kaštel Lukšić               |
| Telephone number                                          | 021 305715                                          |
| E-mail address                                            | Mirjana.kovac@fesb.hr                               |
| Personal web page                                         |                                                     |
| Year of birth                                             | 1971                                                |
| Scientist ID                                              | 297 640                                             |
| Research or art rank, and date of last rank appointment   | Research Associate                                  |

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| Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment                                                           | Assistant Professor, February 2012                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Area and field of election into research or art rank                                                                                                  | Humanities and Social Sciences; Philology                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>INFORMATION ON CURRENT EMPLOYMENT</b>                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Institution where employed                                                                                                                            | Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture, Split                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Date of employment                                                                                                                                    | June, 2006                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Name of position (professor, researcher, associate teacher, etc.)                                                                                     | Professor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Field of research                                                                                                                                     | Communication skills, speech production and speech disfluencies, communication strategies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Function                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>INFORMATION ON EDUCATION – Highest degree earned</b>                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Degree                                                                                                                                                | PhD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Institution                                                                                                                                           | Faculty of Philosophy, University of Zagreb                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Place                                                                                                                                                 | Zagreb                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Date                                                                                                                                                  | 10 <sup>th</sup> March, 2010                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>INFORMATION ON ADDITIONAL TRAINING</b>                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Year                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Place                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Institution                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Field of training                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>MOTHER TONGUE AND FOREIGN LANGUAGES</b>                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Mother tongue                                                                                                                                         | Croatian                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)                                                      | English (5)<br>German (5)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>COMPETENCES FOR THE COURSE</b>                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme) |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Authorship of university/faculty textbooks in the field of the course                                                                                 | M. M. Kovač, N. Sirković: Presentation, Writing and Interpersonal Communication Skills. FESB, Split, 2014.<br>M. M. Kovač, N. Sirković: Strategije rješavanja poteškoća u komunikaciji na stranom jeziku, Hrvatska sveučilišna naklada, Zagreb, 2015.                                                                                                                                                                                                                                                                                                                                                                               |
| Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)                           | M. M. Kovač, N. Sirković: Peer Evaluation of Oral Presentations in Croatia, English Language Teaching. 5 (2012) 7, 8-17.<br>M. M. Kovač: The Influence of Task Type on Perceived Fluency, Studies in English Language Teaching 4 (2016) 2, 241-253.<br>M. M. Kovač: Repetition as a Communication Strategy, Studies in English Language Teaching 4 (2016) 1, 87-104.<br>M. M. Kovač: Utjecaj kognitivne složenosti zadatka na samoispravljanja. <i>Linguistica Copernicana</i> . 5 (2011) 1, 269-300.<br>M. M. Kovač, D. Horga: Ponavljanja kao oblik govorne disfluentnosti. <i>Linguistica Copernicana</i> . 5 (2011) 1, 245-267. |
| Professional and scholarly articles published in the last five years in                                                                               | M. M. Kovač, N. Sirković: Peer Evaluation of Oral Presentations in Croatia, English Language Teaching. 5 (2012) 7, 8-17.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

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| subjects of teaching methodology and teaching quality (5 works at most)                                                                                                                                            |                                                                                                                        |
| Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)                                                                                              |                                                                                                                        |
| The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-<br>pedagoškekompetencije?                 | Graduate study program in English Language and Literature;<br>Graduate study program in German Language and Literature |
| <b>PRIZES AND AWARDS, STUDENT EVALUATION</b>                                                                                                                                                                       |                                                                                                                        |
| Prizes and awards for teaching and scholarly/artistic work                                                                                                                                                         |                                                                                                                        |
| Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated) |                                                                                                                        |

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|---------------------------------------------------------------------------------------------|----------------------------------------------------|
| First and last name and title of teacher                                                    | <b>Ph. D. Ivica Ljubenkov, Assistant Professor</b> |
| The course he/she teaches in the proposed study programme                                   | Olive Processing Technologies                      |
| <b>GENERAL INFORMATION ON COURSE TEACHER</b>                                                |                                                    |
| Address                                                                                     | Cesta F. Tuđmana 228, 21212 Kaštel-Sućurac         |
| Telephone number                                                                            | 021/224-331                                        |
| E-mail address                                                                              | ivica.ljubenkov4@gmail.com                         |
| Personal web page                                                                           |                                                    |
| Year of birth                                                                               | 1958                                               |
| Scientist ID                                                                                | 185946                                             |
| Research or art rank, and date of last rank appointment                                     | Research associate, June 2011.                     |
| Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment | Assistant professor, December 2016.                |
| Area and field of election into research or art rank                                        | Chemistry, Analytical Chemistry                    |
| <b>INFORMATION ON CURRENT EMPLOYMENT</b>                                                    |                                                    |
| Institution where employed                                                                  | Faculty of science, University of Split            |
| Date of employment                                                                          | 07.04.2010.                                        |
| Name of position (professor, researcher, associate teacher, etc.)                           | Assistant professor                                |
| Field of research                                                                           | Analytical chemistry                               |
| Function                                                                                    |                                                    |
| <b>INFORMATION ON EDUCATION – Highest degree earned</b>                                     |                                                    |
| Degree                                                                                      | Dr.sc.                                             |
| Institution                                                                                 | Faculty of science, University of Zagreb           |

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|-------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Place                                                                                                                                                 | Zagreb                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Date                                                                                                                                                  | 03.03.2000.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>INFORMATION ON ADDITIONAL TRAINING</b>                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Year                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Place                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Institution                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Field of training                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>MOTHER TONGUE AND FOREIGN LANGUAGES</b>                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Mother tongue                                                                                                                                         | Croatian                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)                                                      | English (4)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>COMPETENCES FOR THE COURSE</b>                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme) | Olive processing, graduate level KTD202<br>Olive processing, pregraduate level KTF213                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Authorship of university/faculty textbooks in the field of the course                                                                                 | I. Ljubenkov, I. Generalić Mekinić: Olive processing technologies, Laboratory procedure (internal document)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)                           | B. Soldo, M. Šprung, G. Mušac, M. Pavela-Vrančić, I. Ljubenkov: Evaluation of olive fruit lipoxygenase extraction protocols on 9- and 13-Z, E-HPODE formation, <i>Molecules</i> , 21 (2016) 4, 506-515.<br>I. Generalić Mekinić, I. Blažević, I. Mudnić, F. Burčul, M. Grga, D. Skroza, I. Jerčić, I. Ljubenkov, M. Boban, M. Miloš, V. Katalinić: Sea Fennel ( <i>Crithmum maritimum</i> L.): Phytochemical Profile, Antioxidative, Cholinesterase Inhibitory and Vasodilatory Activity, <i>Journal of Food Science and Technology</i> 53 (2016) 7, 3104-3112.<br>I. Generalić Mekinić, D. Skroza, I. Ljubenkov, L. Krstulović, S. Smole Možina, V. Katalinić: Phenolic Acids Profile, Antioxidant and Antibacterial Activity of Chamomile, Common Yarrow and Immortelle ( <i>Asteraceae</i> ), <i>Natural product communications</i> 9 (2014) 12, 1745-174.<br>I. Generalić Mekinić, D. Skroza, I. Ljubenkov, V. Šimat, S. Smole Možina, V. Katalinić: In vitro Antioxidant and Antibacterial Activity of Lamiaceae Phenolic Extracts: A Correlation Study, <i>Food technology and biotechnology</i> 52 (2014) 1, 119-127<br>I. Generalić Mekinić, M. Gotovac, D. Skroza, I. Ljubenkov, F. Burčul, V. Katalinić: Effect of the extraction solvent on the oleuropein content and antioxidant properties of olive leaf (cv. Oblica, Lastovka and Levantinka) extracts, <i>Croatian Journal of Food Science and Technology</i> 6 (2014) 1, 7-14. |
| Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)                                 | Croatian Science Foundation (IP-06-2016) BioSMe "Plants as a source of bioactive sulphur compounds and their ability to hyperaccumulate metals" (2017-2021).<br>2015-2016: Project leader; Programme of support the scientific research projects in agriculture of Split-Dalmatia County for 2015 „Investigation of the antioxidant activity of Bračog varenik                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

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|                                                                                                                                                                                                                    | <p>by ORAC assay".</p> <p>Programme of support the scientific research projects in agriculture of Split-Dalmatia County for 2013: „Enzymes of lipoxygenase pathway in indigenous varieties of olives“, 10.12.2013., Klasa: 402-01/13-01/1655, URBROJ: 2181/1-05-00-02/02-13-0003.</p> <p>Programme of support the scientific research projects in agriculture of Split-Dalmatia County for 2013": Lipid, phenolic and genetic profile in indigenous varieties of olives: <i>Oblice</i>, <i>Levantinke</i>, <i>Buhavice</i> i <i>Drobnice</i> in the early and late period of harvest- Analysis of fatty acids of olive oil by GC technique. Bilateral project "Effect of medicinal plant phenolic extracts on the stability of grape antocyanins" (Croatia-Macedonia) (2012-2014)</p> |
| The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoške kompetencije?                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>PRIZES AND AWARDS, STUDENT EVALUATION</b>                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Prizes and awards for teaching and scholarly/artistic work                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated) |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

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| First and last name and title of teacher                                                    | <b>Ph. D. Mladenka Malenica Staver, Assistant Professor</b>        |
| The course he/she teaches in the proposed study programme                                   | Technology of Meat and Meat Products                               |
| <b>GENERAL INFORMATION ON COURSE TEACHER</b>                                                |                                                                    |
| Address                                                                                     | Radmile Matejčić 2, 51000 Rijeka                                   |
| Telephone number                                                                            | 051/584-564                                                        |
| E-mail address                                                                              | mladenkams@biotech.uniri.hr                                        |
| Personal web page                                                                           |                                                                    |
| Year of birth                                                                               | 1975.                                                              |
| Scientist ID                                                                                | 262683                                                             |
| Research or art rank, and date of last rank appointment                                     | Research Associate, September 2011.                                |
| Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment | Assistant Professor, January, 2012.                                |
| Area and field of election into research or art rank                                        | The area of food technology in the field of biotechnical sciences. |
| <b>INFORMATION ON CURRENT EMPLOYMENT</b>                                                    |                                                                    |
| Institution where employed                                                                  | University of Rijeka, Department of biotechnology                  |
| Date of employment                                                                          | 1.1.2009.                                                          |
| Name of position (professor,                                                                | Senior Assistant                                                   |

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| researcher, associate teacher, etc.)                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Field of research                                                                                                                                     | Food chemistry                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Function                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>INFORMATION ON EDUCATION – Highest degree earned</b>                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Degree                                                                                                                                                | Doctor of biotechnology science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Institution                                                                                                                                           | University of Zagreb, Faculty of Food Technology and Biotechnology                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Place                                                                                                                                                 | Zagreb                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Date                                                                                                                                                  | September, 2001.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>INFORMATION ON ADDITIONAL TRAINING</b>                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Year                                                                                                                                                  | 1.3.-30.11.2000.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Place                                                                                                                                                 | Kulmbach, Germany                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Institution                                                                                                                                           | German state institute for meat research                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Field of training                                                                                                                                     | Meat technology                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>MOTHER TONGUE AND FOREIGN LANGUAGES</b>                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Mother tongue                                                                                                                                         | Croatian                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)                                                      | English (5)<br>Italian (4)<br>German (2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>COMPETENCES FOR THE COURSE</b>                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme) | In the period from 2.5.2008. - 1.1.2009. she worked at the University of Rijeka on scientific and educational activities in the field of chemistry, food technology and food quality. She participated in the organization of teaching the course "Technology and quality control of food I" at undergraduate study Sanitary engineering.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Authorship of university/faculty textbooks in the field of the course                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)                           | <p>O. Koprivnjak, V. Majetić, M. Malenica Staver, A. Lovrić, B. Blagović: Effect of phospholipids on extraction of hydrophilic phenols from virgin olive oils, <i>Food Chemistry</i>, 119 (2010) 698-702.</p> <p>I. Jerkovic, M. Malenica Staver, Z. Marijanovic, M. Gugic: Comparison of headspace solid-phase microextraction and nitrogen purge and steam distillation for determination of terpenes and other ham volatile organic compounds, <i>Chemistry of Natural Compounds</i>, 47 (2012) 1001-1006.</p> <p>M. Malenica Staver, I. Jerković, J. Giacometti, A. Malenica, Z. Marijanović: Fatty-Acid Profile of Total and Polar Lipids in Cultured Rainbow Trout (<i>Oncorhynchus mykiss</i>) Raised in Freshwater and Seawater (Croatia) Determined by Transmethylation Method, <i>Chemistry &amp; Biodiversity</i>, 9 (2012) 1591-1598.</p> <p>J. Pleadin, M. Malenica Staver, N. Vahčić, D. Kovačević, S. Milone, L. Saftić, G. Scortichini: Survey of aflatoxin B1 and ochratoxin A occurrence in traditional meat products coming from Croatian households and markets, <i>Food Control</i>, 52 (2015) 71-77.</p> |
| Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Professional, science and artistic projects in the field of the course                                                                                | Collaborator on the project " Throughput analytical platform for quality control and verification of authenticity of food from the                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

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| carried out in the last five years (5 at most)                                                                                                                                                  | Adriatic region," Head: prof. Jasna Peter-Katalinić; <a href="http://www.adriafood.uniri.hr/hr/aktivnosti.html">http://www.adriafood.uniri.hr/hr/aktivnosti.html</a> , 2012.                                                                                                                                                                                                                                                                                                               |
| The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoške kompetencije? | From 1.1.2009. she has been working at the Department of Biotechnology of the University of Rijeka as the head of the obligatory course of General Chemistry and elective course Bioactive components of the mediterranean diet on the undergraduate study of Biotechnology and drug research.                                                                                                                                                                                             |
| <b>PRIZES AND AWARDS, STUDENT EVALUATION</b>                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Prizes and awards for teaching and scholarly/artistic work                                                                                                                                      | 16.10.1997. - Award from Biotechnical foundation for food technology and biotechnology in Zagreb, for achievements in the field of biotechnology.<br>1.10.1996.- Award from Faculty of Food Technology and Biotechnology in Zagreb for the success achieved during the study (40 <sup>th</sup> anniversary of the Faculty).<br>1.3.2000.-1.12.2000. - Scholarship of the German Ministry for agriculture and food research on the turkey meat.<br>During the study - Croatian state grant. |

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| First and last name and title of teacher                                                    | <b>Ph. D. Ljiljana Najev Čačija, Assistant Professor</b>        |
| The course he/she teaches in the proposed study programme                                   | Entrepreneurship and Management in Food and Beverage Production |
| <b>GENERAL INFORMATION ON COURSE TEACHER</b>                                                |                                                                 |
| Address                                                                                     | Velebitska 68, Split                                            |
| Telephone number                                                                            | 098 299 100                                                     |
| E-mail address                                                                              | ljnajev@efst.hr                                                 |
| Personal web page                                                                           | /                                                               |
| Year of birth                                                                               | 1971                                                            |
| Scientist ID                                                                                | 344153                                                          |
| Research or art rank, and date of last rank appointment                                     | Assistant professor (external associate), 09.02.2016.           |
| Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment | Assistant professor, social sciences, economics (marketing)     |
| Area and field of election into research or art rank                                        | Social sciences, economics                                      |
| <b>INFORMATION ON CURRENT EMPLOYMENT</b>                                                    |                                                                 |
| Institution where employed                                                                  | University of Split, Faculty of Economics - external associate  |
| Date of employment                                                                          | Decenber, 2009.                                                 |
| Name of position (professor, researcher, associate teacher, etc.)                           | external associate                                              |
| Field of research                                                                           | Marketing, entrepreneurship, project management                 |
| Function                                                                                    | External associate                                              |
| <b>INFORMATION ON EDUCATION – Highest degree earned</b>                                     |                                                                 |
| Degree                                                                                      | PhD economics                                                   |
| Institution                                                                                 | University of Split – Faculty of Economics                      |
| Place                                                                                       | Split                                                           |
| Date                                                                                        | 28.03.2014.                                                     |
| <b>INFORMATION ON ADDITIONAL TRAINING</b>                                                   |                                                                 |
| Year                                                                                        | 2014                                                            |
| Place                                                                                       | Zagreb                                                          |



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| Institution                                                                                                                                                             | Innovation institute                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Field of training                                                                                                                                                       | Market research colloquium                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>MOTHER TONGUE AND FOREIGN LANGUAGES</b>                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Mother tongue                                                                                                                                                           | Croatian                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)                                                                        | English (5)<br>Italian (3)<br>Russian (2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>COMPETENCES FOR THE COURSE</b>                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)                   | Teaches courses Marketing strategies, Entrepreneurial workshop, Customer relationship management, Project marketing on undergraduate and graduate level at the Faculty of Economics Split                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Authorship of university/faculty textbooks in the field of the course                                                                                                   | N. Alfirević, J. Pavičić, Lj. Najev Čačija, Z. Mihanović, J. Matković, J.: Osnove marketinga i menadžmenta neprofitnih organizacija. Zagreb : Školska knjiga, Institut za inovacije (udžbenik Sveučilišta u Splitu), 2013.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)                                             | D. Dragnić, Lj. Najev Čačija, I. Marasović, I.: Impact of internal and external factors on SMEs marketing strategy and performance in crisis, u Grbac, B. i sur.: Marketing insights from a changing environment, Pearson Education Ltd., London, 2015.<br>N. Alfirević, J. Pavičić, Lj. Najev-Čačija: Performance of non-profit organizations: Empirical contrasts between privately and publicly funded Croatian humanitarian organizations. Economic annals, 59 (2014) 115-129.<br>Lj. Najev Čačija: Preliminary empirical analysis of the relationship dynamics between marketing activities and fundraising success in nonprofit organizations, Management: Journal of Contemporary Management Issues, 19(2014) 2, 137-155.<br>Ž. Dulčić, N. Alfirević, Lj. Najev Čačija, A. Talaja, B. Sruk: ESOP, privatization and stakeholder capitalism. In <i>2nd International OFEL Conference on Governance, Management and Entrepreneurship</i> , Dubrovnik, Hrvatska, 2014.<br>D. Dragnić, Lj. Najev Čačija, D. Vulić: Informatički alati za upravljanje znanjem kupaca, poglavlje u knjizi: Upravljanje organizacijskim promjenama i znanjem, ur. Alfirević, N.; Garbin Praničević, D.; Talaja, A., Ekonomski fakultet Sveučilišta u Splitu, Split, 2014, 211-226. |
| Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)                         | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)                                                   | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences? | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>PRIZES AND AWARDS, STUDENT EVALUATION</b>                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

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| Prizes and awards for teaching and scholarly/artistic work                                                                                                                                                         |                                                                                                                         |
| Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated) | University of Split – Faculty of Economics<br><br>Customer relationship management 4,4-4,8<br>Project marketing 4,6-4,9 |

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| First and last name and title of teacher                                                         | <b>Ph. D. Zvezdana Popović Perković, Assistant Professor</b>             |
| The course he/she teaches in the proposed study programme                                        | Algae Biotechnology                                                      |
| <b>GENERAL INFORMATION ON COURSE TEACHER</b>                                                     |                                                                          |
| Address                                                                                          | Ruđera Boškovića 37, 21000 Split                                         |
| Telephone number                                                                                 | +385 (21) 510 195; +385 (0)98 952 58 79                                  |
| E-mail address                                                                                   | <a href="mailto:zvezdana.popovic@unist.hr">zvezdana.popovic@unist.hr</a> |
| Personal web page                                                                                | -                                                                        |
| Year of birth                                                                                    | 1982                                                                     |
| Scientist ID                                                                                     | 344221                                                                   |
| Research or art rank, and date of last rank appointment                                          | Professional associate, October 2012                                     |
| Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment      | Assistant professor, April 2014                                          |
| Area and field of election into research or art rank                                             | Biotechnology, Agriculture (Agronomy)                                    |
| <b>INFORMATION ON CURRENT EMPLOYMENT</b>                                                         |                                                                          |
| Institution where employed                                                                       | University of Split, University Department of Marine Studies             |
| Date of employment                                                                               | 1.04.2014                                                                |
| Name of position (professor, researcher, associate teacher, etc.)                                | Assistant professor                                                      |
| Field of research                                                                                | Biotechnology                                                            |
| Function                                                                                         | Assistant professor, researcher                                          |
| <b>INFORMATION ON EDUCATION – Highest degree earned</b>                                          |                                                                          |
| Degree                                                                                           | Ph.D.                                                                    |
| Institution                                                                                      | University of Split, University Department of Marine Studies             |
| Place                                                                                            | Split                                                                    |
| Date                                                                                             | December 18th 2012                                                       |
| <b>INFORMATION ON ADDITIONAL TRAINING</b>                                                        |                                                                          |
| Year                                                                                             |                                                                          |
| Place                                                                                            |                                                                          |
| Institution                                                                                      |                                                                          |
| Field of training                                                                                |                                                                          |
| <b>MOTHER TONGUE AND FOREIGN LANGUAGES</b>                                                       |                                                                          |
| Mother tongue                                                                                    | Croatian                                                                 |
| Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent) | English (5)<br>German (4)                                                |
| <b>COMPETENCES FOR THE COURSE</b>                                                                |                                                                          |
| Earlier experience as course                                                                     | Teacher and practice assistant of several courses:                       |

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| teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)                                                                                           | Pregraduate level: Cell biology (SMB102); General botany (SMB108); Marine botany (SMB209)<br>Graduate level: Marine botany (SMB209)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Authorship of university/faculty textbooks in the field of the course                                                                                                                                              | Marine botany and cell biology practice handbook for students.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)                                                                                        | D. Kremer, R. Jurišić Grubešić, Z. Popović, K. Karlović: Fruit and seed traits of <i>Berberis croatica</i> Horvat and <i>Berberis vulgaris</i> L.. Acta. Bot. Cro., 71 (2012) 1, 115-123.<br>M. Peharda, Z. Popovic, D. Ezgeta-Balić, N. Vrgoč, S. Puljas, A. Frankić: Age and growth of <i>Venus verrucosa</i> (Bivalvia: Veneridae) in the eastern Adriatic Sea. Cah. Biol. Mar., 54 (2013) 281-286.<br>Z. Popović, I. Mladineo, D. Ezgeta-Balić, T. Trumbić, N. Vrgoč, M. Peharda: Reproductive cycle and gonad development of <i>Venus verrucosa</i> L. (Bivalvia: Veneridae) in Kaštela Bay, Adriatic Sea, Croatia. Mar. Biol. Res., 9 (2013) 3, 274-284.<br>N. Stagličić, M. Hervat, L. Kekez, Z. Popović, M. Peharda, N. Vrgoč: Age and growth of <i>Venus verrucosa</i> L. (Bivalvia: Veneridae) in the northern Adriatic, Pula. In: M. Arko-Pijevac & B. Surina (eds.), Prirodoslovna istraživanja riječkog područja Vol. 2. Prirodoslovni muzej-Rijeka, Prirodoslovna biblioteka, Rijeka. (2012) pp. 237-244. |
| Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoške kompetencije?                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>PRIZES AND AWARDS, STUDENT EVALUATION</b>                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Prizes and awards for teaching and scholarly/artistic work                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated) | Department for the quality of the University of Split,<br>Average grade: 4,<br>Scale: from 1 to 5,<br>Course: Marine botany                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

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|-----------------------------------------------------------|-----------------------------------------------|
| First and last name and title of teacher                  | <b>Ph. D. Mila Radan, Assistant Professor</b> |
| The course he/she teaches in the proposed study programme | Food Biotransformations                       |
| <b>GENERAL INFORMATION ON COURSE TEACHER</b>              |                                               |

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|-------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Address                                                                                                                                               | Ruđera Boškovića 35                                                                                                                                                                                                                                                                                                                                                                              |
| Telephone number                                                                                                                                      | 021 329-439                                                                                                                                                                                                                                                                                                                                                                                      |
| E-mail address                                                                                                                                        | mradan@ktf-split.hr                                                                                                                                                                                                                                                                                                                                                                              |
| Personal web page                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                  |
| Year of birth                                                                                                                                         | 23.9.1972.                                                                                                                                                                                                                                                                                                                                                                                       |
| Scientist ID                                                                                                                                          | 3119068                                                                                                                                                                                                                                                                                                                                                                                          |
| Research or art rank, and date of last rank appointment                                                                                               | Scientific associate                                                                                                                                                                                                                                                                                                                                                                             |
| Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment                                                           | Assistant professor, May 2014.                                                                                                                                                                                                                                                                                                                                                                   |
| Area and field of election into research or art rank                                                                                                  | Natural sciences, Chemistry                                                                                                                                                                                                                                                                                                                                                                      |
| <b>INFORMATION ON CURRENT EMPLOYMENT</b>                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                  |
| Institution where employed                                                                                                                            | Faculty of Chemistry and Technology                                                                                                                                                                                                                                                                                                                                                              |
| Date of employment                                                                                                                                    | June 2001                                                                                                                                                                                                                                                                                                                                                                                        |
| Name of position (professor, researcher, associate teacher, etc.)                                                                                     | Assistant professor                                                                                                                                                                                                                                                                                                                                                                              |
| Field of research                                                                                                                                     | Isolation and identification of biologically active compounds                                                                                                                                                                                                                                                                                                                                    |
| Function                                                                                                                                              | Head of biochemistry department                                                                                                                                                                                                                                                                                                                                                                  |
| <b>INFORMATION ON EDUCATION – Highest degree earned</b>                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                  |
| Degree                                                                                                                                                | Doctorate degree                                                                                                                                                                                                                                                                                                                                                                                 |
| Institution                                                                                                                                           | Faculty of Chemistry and Technology                                                                                                                                                                                                                                                                                                                                                              |
| Place                                                                                                                                                 | Split, Croatia                                                                                                                                                                                                                                                                                                                                                                                   |
| Date                                                                                                                                                  | 11.6.2007.                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>INFORMATION ON ADDITIONAL TRAINING</b>                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                  |
| Year                                                                                                                                                  | 10/2005 - 12/2005                                                                                                                                                                                                                                                                                                                                                                                |
| Place                                                                                                                                                 | Rome, Italy                                                                                                                                                                                                                                                                                                                                                                                      |
| Institution                                                                                                                                           | INRAN (Istituto Nazionale di ricerca per gli alimenti e la nutrizione)                                                                                                                                                                                                                                                                                                                           |
| Field of training                                                                                                                                     | Nutrition impact on oxidative stress within the organism                                                                                                                                                                                                                                                                                                                                         |
| MOTHER TONGUE AND FOREIGN LANGUAGES                                                                                                                   | Croatian                                                                                                                                                                                                                                                                                                                                                                                         |
| Mother tongue                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                  |
| Mother tongue                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                  |
| Mother tongue                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                  |
| Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)                                                      | English (5)<br>Italian (3)                                                                                                                                                                                                                                                                                                                                                                       |
| <b>COMPETENCES FOR THE COURSE</b>                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                  |
| Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme) | Modern methods in biochemistry, Graduate chemistry study program, orientation: Organic chemistry and biochemistry                                                                                                                                                                                                                                                                                |
| Authorship of university/faculty textbooks in the field of the course                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                  |
| Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)                           | M. Jukić, F. Burčul, I. Carev, O. Politeo, M. Miloš: Screening for acetylcholinesterase inhibition and antioxidant activity of selected plants from Croatia. Natural Product Research 26 (2012) 18, 1703-1707.<br>O. Politeo, I. Botica, T. Bilušić, M. Jukić, I. Carev, F. Burčul, M. Miloš: Chemical composition and evaluation of acetylcholinesterase inhibition and antioxidant activity of |

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|                                                                                                                                                                                                 | essential oil from Dalmatian endemic species <i>Pinus nigra</i> Arnoldssp. <i>Dalmatica</i> (Vis.) Franco. Journal of Medicinal Plants Research 5 (2011) 30, 6590-6596.                                                                                                                                                                                                              |
| Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)                                                 |                                                                                                                                                                                                                                                                                                                                                                                      |
| Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)                                                                           | 2015-2019: researcher on the project "The study of bioactive compounds from Dalmatian plants: their antioxidant character and impact on enzyme inhibition and health" Croatian science foundation grant: IP-2014-09-6897<br>2008-2013: researcher on national project "Antioxidative compounds and cholinesterase inhibitors from aromatic plants" (grant number: 011-2160547-1330). |
| The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoške kompetencije? | Undergraduate study for the professor of biology and chemistry. Ten years teaching experience on an undergraduate and graduate level at Faculty of chemistry, Faculty of pharmacy and Faculty of medicine (including teaching at study program in English).                                                                                                                          |
| <b>PRIZES AND AWARDS, STUDENT EVALUATION</b>                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                      |
| Prizes and awards for teaching and scholarly/artistic work                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                      |

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|---------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| First and last name and title of teacher                                                    | <b>Ph. D. Mirko Ruščić, Assistant Professor</b>                                                       |
| The course he/she teaches in the proposed study programme                                   | Ethnobotany                                                                                           |
| <b>GENERAL INFORMATION ON COURSE TEACHER</b>                                                |                                                                                                       |
| Address                                                                                     | Ruđera Boškovića 33, 21000 Split, Croatia                                                             |
| Telephone number                                                                            | 00 385 (0) 619 222                                                                                    |
| E-mail address                                                                              | mrus@pmfst.hr                                                                                         |
| Personal web page                                                                           | <a href="http://bib.irb.hr/lista-radova?autor=270013">http://bib.irb.hr/lista-radova?autor=270013</a> |
| Year of birth                                                                               | 1965                                                                                                  |
| Scientist ID                                                                                | 270013                                                                                                |
| Research or art rank, and date of last rank appointment                                     | Research associate, 2012.                                                                             |
| Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment | Assistant professor, 2012.                                                                            |
| Area and field of election into research or art rank                                        | Natural sciences, Biology                                                                             |
| <b>INFORMATION ON CURRENT EMPLOYMENT</b>                                                    |                                                                                                       |
| Institution where employed                                                                  | Faculty of Sciences, University of Split                                                              |
| Date of employment                                                                          | 1. February 2011.                                                                                     |
| Name of position (professor, researcher, associate teacher, etc.)                           | Assistant professor                                                                                   |
| Field of research                                                                           | Botany and Teaching Methods in Biology                                                                |
| Function                                                                                    | Head of the Botanical Garden of the Faculty of Science - Split<br>Head of Division of Biology         |
| <b>INFORMATION ON EDUCATION – Highest degree earned</b>                                     |                                                                                                       |

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| Degree                                                                                                                                                | Ph.D.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Institution                                                                                                                                           | University of Split, Faculty of Sciences                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Place                                                                                                                                                 | Split                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Date                                                                                                                                                  | 19. November, 2010.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>INFORMATION ON ADDITIONAL TRAINING</b>                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Year                                                                                                                                                  | 2005/06, 2007, 2014                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Place                                                                                                                                                 | Zagreb                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Institution                                                                                                                                           | University of Zagreb, Faculty of Science, Department of Botany, Division of Biology, State Institute for Nature Protection Zagreb, NCVVO Zagreb                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Field of training                                                                                                                                     | Botany, Flora, Mapping of Croatian flora                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>MOTHER TONGUE AND FOREIGN LANGUAGES</b>                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Mother tongue                                                                                                                                         | Croatian                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)                                                      | English (3)<br>French (2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>COMPETENCES FOR THE COURSE</b>                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme) | Pharmaceutical botany, Integrated undergraduate and graduate study of Pharmacy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Authorship of university/faculty textbooks in the field of the course                                                                                 | A. Alegro <i>et al.</i> : Botanically important areas of Croatia, Zagreb: Faculty of Sciences and Školska knjiga d.d., 2010.<br>S. Kovačić <i>et al.</i> : Flora of Adriatic coast and islands - 250 common species. Zagreb: Školska knjiga d.d., and Faculty of Science, 2008.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)                           | I. Blažević, F. Burčul, M. Ruščić, J. Mastelić: Glucosinolates, volatile constituents, and acetylcholinesterase inhibitory activity of <i>Alyssoides utriculata</i> . Chemistry of Natural Compounds, 49 (2013) 374-378.<br>I. Blažević, T. Maleš, M. Ruščić: Glucosinolates of <i>Lunaria annua</i> (L.): thermal, enzymatic and chemical degradation. Chemistry of Natural Compounds. 49 (2014) 1154-1157.<br>I. Blažević, G. R. De Nicola, S. Montaut, P. Rollin, M. Ruščić: Glucosinolate profile of Croatian stenoendemic plant <i>Fibigia triquetra</i> (DC.) Boiss. ex Prantl. Croatica Chemica Acta. 88 (2015) 307-314.<br>N. Jasprica, S. Bogdanović, K. Dolina, M. Ruščić, M. Pandža, S. Kovačić: Syntaxonomy of <i>Arundo</i> stands along the eastern Adriatic coast. Plant biosystems, 150 (2016) 5; 887-903.<br>S. Montaut, I. Blažević, M. Ruščić, P. Rollin. LC-MS profiling of glucosinolates in the seeds of <i>Brassica elongata</i> Ehrh., and of the two stenoendemic <i>B. botteri</i> Vis and <i>B. cazzae</i> Ginz. & Teyber. Natural product research 31 (2017) 1, 58-62. |
| Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)       | M. Ruščić, I. Podrug, D. Sirovina: Research of student understanding of basic biological concept of the menstrual cycle. 12 <sup>th</sup> Croatian Biological Congress with International Participation (2015).<br>M. Ruščić, N. Kletečki, I. Radanović: Research on acquiring the botanical teaching contents in elementary school. 3. Croatian Botanical Congress (2010).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)                                 | Project co-worker (2017.-2021.): Croatian Science Foundation (IP-06-2016-1316): "Plants as a source of bioactive sulphur compounds and their ability to hyperaccumulate metals" (project leader: Assist. prof. I. Blažević)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |



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|                                                                                                                                                                                                                    | Project co-worker (2007.-2013.) (No. 177-11911196-0829): "Mechanisms for Genome Stability Preservation in Cormophytes" (project leader: Prof. dr. J. Puizina);<br>Project co-worker (2007.-2013.) (No. 119-1191193-1227): "Biodiversity of vascular flora in amphi-Adriatic region" (project leader: Prof. dr. T. Nikolić)<br>STEMP |
| The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?                                            | Graduate study - Professor of Biology                                                                                                                                                                                                                                                                                               |
| <b>PRIZES AND AWARDS, STUDENT EVALUATION</b>                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                     |
| Prizes and awards for teaching and scholarly/artistic work                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                     |
| Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated) |                                                                                                                                                                                                                                                                                                                                     |

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|---------------------------------------------------------------------------------------------|----------------------------------------------------------|
| First and last name and title of teacher                                                    | <b>Ph. D. Vesna Sokol, Associate Professor</b>           |
| The course he/she teaches in the proposed study programme                                   | Physical Properties of Food                              |
| <b>GENERAL INFORMATION ON COURSE TEACHER</b>                                                |                                                          |
| Address                                                                                     | Ruđer Bošković 35, 21 000 Split                          |
| Telephone number                                                                            | 021-329-445                                              |
| E-mail address                                                                              | vsokol@ktf-split.hr                                      |
| Personal web page                                                                           |                                                          |
| Year of birth                                                                               | 1968.                                                    |
| Scientist ID                                                                                | 212806                                                   |
| Research or art rank, and date of last rank appointment                                     | Senior Research Associate, 2014.                         |
| Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment | Associate Professor, 2015.                               |
| Area and field of election into research or art rank                                        | Natural Sciences, Chemistry, Physical Chemistry          |
| <b>INFORMATION ON CURRENT EMPLOYMENT</b>                                                    |                                                          |
| Institution where employed                                                                  | Faculty of Chemistry and Technology, University of Split |
| Date of employment                                                                          | 1. 8. 1996.                                              |
| Name of position (professor, researcher, associate teacher, etc.)                           | Associate Professor                                      |
| Field of research                                                                           | Physical Chemistry                                       |
| Function                                                                                    | Head of Department of Physical Chemistry                 |
| <b>INFORMATION ON EDUCATION – Highest degree earned</b>                                     |                                                          |
| Degree                                                                                      | Ph.D.                                                    |
| Institution                                                                                 | Faculty of Chemistry and Technology, University of Split |
| Place                                                                                       | Split                                                    |



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|-------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Date                                                                                                                                                  | 31. 10. 2006.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>INFORMATION ON ADDITIONAL TRAINING</b>                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Year                                                                                                                                                  | 2007.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Place                                                                                                                                                 | Rijeka                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Institution                                                                                                                                           | University of Rijeka                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Field of training                                                                                                                                     | Synchrotron radiation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>MOTHER TONGUE AND FOREIGN LANGUAGES</b>                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Mother tongue                                                                                                                                         | Croatian                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)                                                      | English (4)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>COMPETENCES FOR THE COURSE</b>                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme) | Physical Chemistry I, Undergraduated study of chemistry<br>Physical Chemistry, Undergraduated study of chemical technology<br>Physical Chemistry of Electrolyte Solutions, Graduated study of chemistry<br>Colloid Chemistry, Graduated study of chemistry                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Authorship of university/faculty textbooks in the field of the course                                                                                 | J. Radošević, V. Sokol, R. Tomaš, P. Bošković, Laboratory Exercises in Physical Chemistry, University handbook, University of Split, Faculty of Chemistry and Technology, Split, 2016.<br>V. Sokol, P. Bošković, Exercises in Colloid Chemistry, Faculty of Chemistry and Technology, Split, 2016.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)                           | P. Bošković, V. Sokol, D. Touraud, A. Prkić, J. Giljanović: The Nanostructure Studies of Surfactant-Free-Microemulsions in Fragrance Tinctures, Acta chimica Slovenica. 63 (2016) 1, 138-143.<br>P. Bošković, V. Sokol, T. Zemb, D. Touraud, W. Kunz: Weak Micelle-Like Aggregation in Ternary Liquid Mixtures as Revealed by Conductivity, Surface Tension and Light Scattering, The journal of physical chemistry. B, Condensed matter, materials, surfaces, interfaces & biophysical. 119 (2015) 30, 9933-9939.<br>M. Tranfić Bakić, D. Jadreško, T. Hrenar, G. Horvat, J. Požar, N. Galić, V. Sokol, R. Tomaš, S. Alihodžić, M. Žinić, L. Frkanec, V. Tomišić: Fluorescent phenanthridine-based calix[4]arene derivatives: synthesis and thermodynamic and computational studies of their complexation with alkali-metal cations. RSC Advances. 5 (2015) 30, 23900-23914.<br>P. Bošković, V. Sokol, A. Prkić, J. Giljanović: Conductometric Study of Sodium Chloride in Aqueous 2- methylpropan-2-ol of Mass Fraction 0.10, 0.30, 0.50, 0.70, 0.80 and 0.90; International journal of electrochemical science. 9 (2014) 7, 3574-3587.<br>A. Jurić, A. Prkić, J. Giljanović, M. Brkljača, V. Sokol, P. Bošković, T. Vukušić: Determination of Total Fluoride Content in Teas by Using Fluoride Ion-Selective Electrode, International journal of electrochemical science. 9 (2014) 10, 5409-5415. |
| Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Professional, science and artistic projects in the field of the course                                                                                | Scientific project 011-0000000-3220: " Electrolytes in mixed solvents ", Ministry of Science, Education and Sports                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

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| carried out in the last five years (5 at most)                                                                                                                                                                     |  |
| The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoške kompetencije?                    |  |
| <b>PRIZES AND AWARDS, STUDENT EVALUATION</b>                                                                                                                                                                       |  |
| Prizes and awards for teaching and scholarly/artistic work                                                                                                                                                         |  |
| Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated) |  |

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|---------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| First and last name and title of teacher                                                    | <b>Ph. D. Nataša Stipanelov Vrandečić, Full Professor</b>                                                                           |
| The course he/she teaches in the proposed study programme                                   | Novel Food Packaging Techniques                                                                                                     |
| <b>GENERAL INFORMATION ON COURSE TEACHER</b>                                                |                                                                                                                                     |
| Address                                                                                     | Faculty of Chemistry and Technology, Teslina 10/V, 21 000 Split, Croatia                                                            |
| Telephone number                                                                            | 00385 21 329 459                                                                                                                    |
| E-mail address                                                                              | nstip@ktf-split.hr                                                                                                                  |
| Personal web page                                                                           | <a href="http://tkojetko.irb.hr/znanstvenikDetalji.php?sifznan=7463">http://tkojetko.irb.hr/znanstvenikDetalji.php?sifznan=7463</a> |
| Year of birth                                                                               | 1966.                                                                                                                               |
| Scientist ID                                                                                | 226264                                                                                                                              |
| Research or art rank, and date of last rank appointment                                     | Senior Research Scientist, April 2010                                                                                               |
| Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment | Full Professor, October 2015                                                                                                        |
| Area and field of election into research or art rank                                        | Area: Technical Sciences; Field: Chemical Engineering                                                                               |
| <b>INFORMATION ON CURRENT EMPLOYMENT</b>                                                    |                                                                                                                                     |
| Institution where employed                                                                  | Faculty of Chemistry and Technology                                                                                                 |
| Date of employment                                                                          | 1995-06-01                                                                                                                          |
| Name of position (professor, researcher, associate teacher, etc.)                           | Full Professor                                                                                                                      |
| Field of research                                                                           | Chemical Engineering in Materials Development                                                                                       |
| Function                                                                                    | Vice dean                                                                                                                           |
| <b>INFORMATION ON EDUCATION – Highest degree earned</b>                                     |                                                                                                                                     |
| Degree                                                                                      | Ph. D.                                                                                                                              |
| Institution                                                                                 | Faculty of Chemistry and Technology                                                                                                 |
| Place                                                                                       | Split                                                                                                                               |
| Date                                                                                        | 2003-3-28                                                                                                                           |
| <b>INFORMATION ON ADDITIONAL TRAINING</b>                                                   |                                                                                                                                     |
| Year                                                                                        |                                                                                                                                     |

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| Place                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Institution                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Field of training                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>MOTHER TONGUE AND FOREIGN LANGUAGES</b>                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Mother tongue                                                                                                                                                           | Croatian                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)                                                                        | English (4)<br>French (2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>COMPETENCES FOR THE COURSE</b>                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)                   | Packaging, Professional Study of Chemical Technology; Study Orientations: Food Technology<br>Packaging, Academic Graduate Study of Chemical Technology, Study Orientations: Mediterranean Crops                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Authorship of university/faculty textbooks in the field of the course                                                                                                   | Packaging, handbook, Faculty of Chemistry and Technology, Split, 2010.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)                                             | M. Jakić, N. Stipanelov Vrandečić, M. Erceg: The influence of poly(ethylene glycol) on thermal properties of poly(vinyl chloride)/poly(ethylene oxide) blends, Journal of Thermal Analysis and Calorimetry, 1 (2016) 1-12<br>M. Jakić, N. Stipanelov Vrandečić, M. Erceg: Thermal degradation of poly(3-hydroxybutyrate)/poly(ethylene oxide) blends: Thermogravimetric and kinetic analysis. European Polymer Journal, 81 (2016) 376-385<br>M. Jakić, N. Stipanelov Vrandečić, M. Erceg: Kinetic analysis of the non-isothermal degradation of poly(vinyl chloride)/poly(ethylene oxide) blends. Journal of Thermal Analysis and Calorimetry, 123 (2016) 1513-1522<br>M. Jakić, N. Stipanelov Vrandečić, V. Ocelić Bulatović, E. Govorčin Bajsić: Miscibility of Poly(Vinyl Chloride) with Poly(Ethylene Oxide) of Different Molecular Weights. Chemical and Biochemical Engineering Quarterly, 30 (2016) 61-71<br>M. Jakić, N. Stipanelov Vrandečić, I. Klarić: Thermal degradation of poly(vinyl chloride)/poly(ethylene oxide) blends: Thermogravimetric analysis, Polymer Degradation and Stability 98 (2013) 1738-1743. |
| Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)                                                   | Scientific project 011-1252971-2249: Polymer Blends with Biodegradable Components (2007-2013)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences? |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>PRIZES AND AWARDS, STUDENT EVALUATION</b>                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Prizes and awards for teaching and scholarly/artistic work                                                                                                              | Award of the Society of Plastics and Rubber for master's thesis in the field of polymeric technology (2001-12-4).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Results of student evaluation taken in the last five years for the course                                                                                               | Evaluation organizer: University of Split<br>Packaging: Average Grade: 4.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

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| that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated) |  |
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| First and last name and title of teacher                                                                                                              | <b>Ph. D. Sandra Svilović, Associate Professor</b>           |
| The course he/she teaches in the proposed study programme                                                                                             | Biochemical Engineering                                      |
| <b>GENERAL INFORMATION ON COURSE TEACHER</b>                                                                                                          |                                                              |
| Address                                                                                                                                               | Ruđera Boškovića 35                                          |
| Telephone number                                                                                                                                      | ++385 21 329 431                                             |
| E-mail address                                                                                                                                        | sandra@ktf-split.hr                                          |
| Personal web page                                                                                                                                     |                                                              |
| Year of birth                                                                                                                                         | 1974                                                         |
| Scientist ID                                                                                                                                          | 237630                                                       |
| Research or art rank, and date of last rank appointment                                                                                               | Research scientist, May 2013                                 |
| Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment                                                           | Associate professor, October 2015                            |
| Area and field of election into research or art rank                                                                                                  | Technical sciences, Chemical engineering                     |
| <b>INFORMATION ON CURRENT EMPLOYMENT</b>                                                                                                              |                                                              |
| Institution where employed                                                                                                                            | Faculty of Chemistry and Technology, University of Split     |
| Date of employment                                                                                                                                    | June 1 <sup>st</sup> , 2000                                  |
| Name of position (professor, researcher, associate teacher, etc.)                                                                                     | Associate professor                                          |
| Field of research                                                                                                                                     | Reaction engineering                                         |
| Function                                                                                                                                              |                                                              |
| <b>INFORMATION ON EDUCATION – Highest degree earned</b>                                                                                               |                                                              |
| Degree                                                                                                                                                | PhD                                                          |
| Institution                                                                                                                                           | Faculty of Chemistry and Technology, University of Split     |
| Place                                                                                                                                                 | Split                                                        |
| Date                                                                                                                                                  | July 23 <sup>rd</sup> , 2009                                 |
| <b>INFORMATION ON ADDITIONAL TRAINING</b>                                                                                                             |                                                              |
| Year                                                                                                                                                  | 2003                                                         |
| Place                                                                                                                                                 | Split                                                        |
| Institution                                                                                                                                           | Faculty of Science, University of Split                      |
| Field of training                                                                                                                                     | Software Mathematica                                         |
| <b>MOTHER TONGUE AND FOREIGN LANGUAGES</b>                                                                                                            |                                                              |
| Mother tongue                                                                                                                                         | Croatian                                                     |
| Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)                                                      | English (4)                                                  |
| <b>COMPETENCES FOR THE COURSE</b>                                                                                                                     |                                                              |
| Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme) | Biochemical engineering - Graduate study Chemical technology |

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| Authorship of university/faculty textbooks in the field of the course                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)                                                                                        | <p>I. Generalić Mekinić, D. Skroza, B. Ristovski, I. Ljubenkov, I. Bikić, S. Svilović, M. Banović, M. Bocevska, V. Katalinić: Anthocyanidins in Babica, Ljutun and Crljenak Kaštelanski grapes and kinetic and their degradation under different storage conditions, <i>Journal of Food and Nutrition Research</i>, 55 (2016) 294-302.</p> <p>J. Vladić, Z. Zeković, S. Jokić, S. Svilović, S. Kovačević S. Vidović: Winter savory: supercritical carbon dioxide extraction and mathematical modeling of extraction process, <i>Journal of Supercritical Fluids</i>, 117 (2016) 89-97.</p> <p>S. Jokić, S. Svilović, S. Vidović: Modelling the supercritical CO<sub>2</sub> extraction kinetics of soybean oil, <i>Croatian Journal of Food Science and Technology</i>, 7 (2015) 52-57.S.</p> <p>Z. Zeković, S. Filip, S. Vidović, S. Jokić, S. Svilović: Mathematical modeling of <i>Ocimum basilicum</i> L. supercritical carbon dioxide extraction, <i>Chemical Engineering &amp; Technology</i> 37 (2014) 2123-2128.</p> <p>S. Jokić, R. Sudar, S. Svilović, S. Vidović, M. Bilić, D. Velić, V. Jurković: Fatty acid composition of the oil obtained from soybeans by extraction with supercritical carbon dioxide, <i>Czech Journal of Food Sciences</i> 31 (2013) 116-125.</p> |
| Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)                                                                                              | <p>Project 011-0112247-2245</p> <p>Chemical engineering in examination of mariculture</p> <p>HRZZ Research Project (IP-11-2013-4981) Impact of processing conditions on kinetics of heterogeneous systems in agitated batch reactors (HETMIX)</p> <p>HRZZ Research Project (IP-06-2016) Plants as a source of bioactive sulphur compounds and their ability to hyperaccumulate metals (BioSMe) (2017-2021).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoške kompetencije?                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>PRIZES AND AWARDS, STUDENT EVALUATION</b>                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Prizes and awards for teaching and scholarly/artistic work                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated) |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

First and last name and title of

**Ph. D. Vida Šimat, Assistant Professor**

|                                                                                             |                                                                                                                                                                                                             |
|---------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| teacher                                                                                     |                                                                                                                                                                                                             |
| The course he/she teaches in the proposed study programme                                   | Seafood Processing Technology, Seafood Quality and Safety                                                                                                                                                   |
| <b>GENERAL INFORMATION ON COURSE TEACHER</b>                                                |                                                                                                                                                                                                             |
| Address                                                                                     | Ruđera Boškovića 37, 21000 Split                                                                                                                                                                            |
| Telephone number                                                                            | +38521558254                                                                                                                                                                                                |
| E-mail address                                                                              | vida@unist.hr                                                                                                                                                                                               |
| Personal web page                                                                           | <a href="http://more.unist.hr/Organizacija/Imenik/tabid/633/agentType/View/PropertyID/1184/Default.aspx">http://more.unist.hr/Organizacija/Imenik/tabid/633/agentType/View/PropertyID/1184/Default.aspx</a> |
| Year of birth                                                                               | 1980.                                                                                                                                                                                                       |
| Scientist ID                                                                                | 288561                                                                                                                                                                                                      |
| Research or art rank, and date of last rank appointment                                     | 2015. research scientist                                                                                                                                                                                    |
| Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment | Since 2011. Assistant professor.                                                                                                                                                                            |
| Area and field of election into research or art rank                                        | Biotechnical Sciences, Food Technology                                                                                                                                                                      |
| <b>INFORMATION ON CURRENT EMPLOYMENT</b>                                                    |                                                                                                                                                                                                             |
| Institution where employed                                                                  | University Department of Marine Studies University of Split                                                                                                                                                 |
| Date of employment                                                                          | 1. 09. 2006.                                                                                                                                                                                                |
| Name of position (professor, researcher, associate teacher, etc.)                           | Asistant                                                                                                                                                                                                    |
| Field of research                                                                           | Quality and food safety                                                                                                                                                                                     |
| Function                                                                                    |                                                                                                                                                                                                             |
| <b>INFORMATION ON EDUCATION – Highest degree earned</b>                                     |                                                                                                                                                                                                             |
| Degree                                                                                      | 2008                                                                                                                                                                                                        |
| Institution                                                                                 | Zagreb, Hrvatska                                                                                                                                                                                            |
| Place                                                                                       | TAIEX                                                                                                                                                                                                       |
| Date                                                                                        | Mikrobiološki zahtjevi za hranu                                                                                                                                                                             |
| Degree                                                                                      | 2009                                                                                                                                                                                                        |
| Institution                                                                                 | Lyngby, Danska                                                                                                                                                                                              |
| Place                                                                                       | National Institute of Aquatic Resources, Technical University of Denmark                                                                                                                                    |
| Date                                                                                        | Biogenic amines in seafood (+HPLC training)                                                                                                                                                                 |
| Degree                                                                                      | 2009                                                                                                                                                                                                        |
| Institution                                                                                 | Kopenhagen, Danska                                                                                                                                                                                          |
| Place                                                                                       | Seafood Circle i DTUAqua, Technical University of Denmark.                                                                                                                                                  |
| Date                                                                                        | Seafood and health                                                                                                                                                                                          |
| Degree                                                                                      | 2011                                                                                                                                                                                                        |
| Institution                                                                                 | Beograd, Srbija                                                                                                                                                                                             |
| Place                                                                                       | Faculty of Chemistry, University of Belgrade                                                                                                                                                                |
| Date                                                                                        | Food Safety and Health Effects of Food                                                                                                                                                                      |
| Degree                                                                                      | 2013                                                                                                                                                                                                        |
| Institution                                                                                 | Zagreb, Hrvatska                                                                                                                                                                                            |
| Place                                                                                       | TAIEX                                                                                                                                                                                                       |
| Date                                                                                        | Labelling requirements for fisheries and aquaculture products                                                                                                                                               |
| <b>INFORMATION ON ADDITIONAL TRAINING</b>                                                   |                                                                                                                                                                                                             |
| Year                                                                                        |                                                                                                                                                                                                             |
| Place                                                                                       |                                                                                                                                                                                                             |
| Institution                                                                                 |                                                                                                                                                                                                             |
| Field of training                                                                           |                                                                                                                                                                                                             |
| <b>MOTHER TONGUE AND FOREIGN LANGUAGES</b>                                                  |                                                                                                                                                                                                             |

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|------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mother tongue                                                                                                                                              | Croatian                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)                                                           | English (5)<br>Italian (5)<br>Spanish (3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>COMPETENCES FOR THE COURSE</b>                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)      | University Department of Marine Studies<br><u>Pregraduated study:</u><br>Preservation and processing of seafood;<br>Hygiene in fishery economy,<br><u>Graduated study:</u><br>Quality assessment of seafood;<br>Fish preservation by salting, drying and smoking;<br>Freezing and cooling technology of marine organisms;<br>Marine originated foods.<br><u>PhD study:</u><br>Seafood processing                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Authorship of university/faculty textbooks in the field of the course                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)                                | D. Skroza, I. Generalić Mekinić, S. Svilović, V. Šimat, V. Katalinić: Investigation of the potential synergistic effect of resveratrol with other phenolic compounds : A case of binary phenolic mixtures. Journal of food composition and analysis. 38 (2015) 13-18.<br>T. Bogdanović, I. Ujević, M. Sedak, E. Listeš, V. Šimat, S. Petričević, V. Poljak: As, Cd, Hg and Pb in four edible shellfish species from breeding and harvesting areas along the eastern Adriatic Coast, Croatia. Food chemistry. 146 (2014) 1, 197-203.<br>I. Mladineo, V. Šimat, J. Miletić, R. Beck, V. Poljak: Molecular identification and population dynamic of Anisakis pegreffii (Nematoda: Anisakidae Dujardin, 1845) isolated from the European anchovy (Engraulis encrasicolus L.) in the Adriatic Sea. International journal of food microbiology. 157 (2012) 2; 224-229<br>T. Bogdanović, V. Šimat, A. Frka-Roić, K. Marković: Development and application of Quality Index Method scheme in a shelf life study of wild and fish farm affected bogue (Boops boops, L.). Journal of food science. 77 (2012) 811-818.<br>V. Šimat, T. Bogdanović, M. Krželj, A. Soldo, J. Maršić Lučić: Differences in chemical, physical and sensory properties during shelf life assessment of wild and farmed gilthead sea bream (Sparus aurata, L.). Journal of Applied Ichthyology. 28 (2012) 95-101. |
| Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of | 2015-2019. Research of bioactive compounds from Dalmatian plants: their antioxidative charcter and effects on enzyme inhibition and health. BioActCom IP-2014-09-6897 (head: PhD Mladen Miloš, full professor)- collaborator<br>Optimization of HPLC method for determination of histamine and other biogenic amine in seafood. 2009.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |



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| competences?-pedagoške kompetencije?                                                                                                                                                                               | Impact of fishing and aquaculture on ecosystem of Adriatic, 2007-2013.<br>Hyperspectral detector of parasite <i>Anisakis</i> spp. in fish fillets, 2014. |
| <b>PRIZES AND AWARDS, STUDENT EVALUATION</b>                                                                                                                                                                       |                                                                                                                                                          |
| Prizes and awards for teaching and scholarly/artistic work                                                                                                                                                         | Winner of support of "Biotechnical foundation" for the year 2010                                                                                         |
| Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated) |                                                                                                                                                          |

|                                                                                             |                                                                                                                                                                                                                                                   |
|---------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| First and last name and title of teacher                                                    | <b>Ph. D. Marina Trgo, Full Professor</b>                                                                                                                                                                                                         |
| The course he/she teaches in the proposed study programme                                   | Sustainable Technology in Food Industries, Introduction to Scientific Research                                                                                                                                                                    |
| <b>GENERAL INFORMATION ON COURSE TEACHER</b>                                                |                                                                                                                                                                                                                                                   |
| Address                                                                                     | Ruđera Boškovića 35, 21000 Split                                                                                                                                                                                                                  |
| Telephone number                                                                            | 021329454                                                                                                                                                                                                                                         |
| E-mail address                                                                              | mtrgo@ktf-split.hr                                                                                                                                                                                                                                |
| Personal web page                                                                           | <a href="https://tkojetko.irb.hr/znanstvenikDetalji.php?sifznan=6917">https://tkojetko.irb.hr/znanstvenikDetalji.php?sifznan=6917</a>                                                                                                             |
| Year of birth                                                                               | 1972                                                                                                                                                                                                                                              |
| Scientist ID                                                                                | 218460                                                                                                                                                                                                                                            |
| Research or art rank, and date of last rank appointment                                     | Scientific adviser, October 2012                                                                                                                                                                                                                  |
| Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment | Full professor, May 20015                                                                                                                                                                                                                         |
| Area and field of election into research or art rank                                        | Technical sciences, chemical engineering                                                                                                                                                                                                          |
| <b>INFORMATION ON CURRENT EMPLOYMENT</b>                                                    |                                                                                                                                                                                                                                                   |
| Institution where employed                                                                  | Faculty of Chemistry and Technology, University of Split                                                                                                                                                                                          |
| Date of employment                                                                          | 1st March 1996                                                                                                                                                                                                                                    |
| Name of position (professor, researcher, associate teacher, etc.)                           | Full professor, higher scientific researcher,                                                                                                                                                                                                     |
| Field of research                                                                           | Lecturer and research work within the field of chemical and environmental engineering                                                                                                                                                             |
| Function                                                                                    | Leader researcher on project financed by Croatian Science Foundation<br>Researcher on bilateral Croatian-Serbian project<br>Researcher on bilateral Croatian-Slovenian project<br>Vice-Dean for scientific research and international cooperation |
| <b>INFORMATION ON EDUCATION – Highest degree earned</b>                                     |                                                                                                                                                                                                                                                   |
| Degree                                                                                      | PhD                                                                                                                                                                                                                                               |
| Institution                                                                                 | Faculty of Chemistry and Technology, University of Split                                                                                                                                                                                          |
| Place                                                                                       | Split                                                                                                                                                                                                                                             |
| Date                                                                                        | 17th December 2003                                                                                                                                                                                                                                |
| <b>INFORMATION ON ADDITIONAL TRAINING</b>                                                   |                                                                                                                                                                                                                                                   |
| Year                                                                                        |                                                                                                                                                                                                                                                   |
| Place                                                                                       |                                                                                                                                                                                                                                                   |

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|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Institution                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Field of training                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>MOTHER TONGUE AND FOREIGN LANGUAGES</b>                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Mother tongue                                                                                                                                         | Croatian                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)                                                      | English (5)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>COMPETENCES FOR THE COURSE</b>                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme) | <p>Industry and environment (2001 - today), lectures, exercises , Faculty of Chemistry and Technology, University of Split</p> <p>Water in industry (2004 - today), lectures, seminars, exercises , Faculty of Chemistry and Technology, University of Split</p> <p>Water technology (2006 - today), lectures, seminars, exercises , Faculty of Chemistry and Technology, University of Split</p> <p>Water technology (2006 - 2010 ), lectures, exercises, University of Applied Sciences, Knin</p> <p>Chemistry in industry (2007 - today), lectures, Faculty of Science, University of Split</p> <p>Natural zeolites in environmental protection (2010), lectures, Faculty of Chemistry and Technology, University of Split</p> <p>Wastewater treatment (2004 - 2006), lectures, exercises, Faculty of Chemistry and Technology, University of Split</p> <p>Industrial wastewaters (2007) lectures, seminars, exercises, Faculty of Chemistry and Technology, University of Split.</p>                                                                                                                                          |
| Authorship of university/faculty textbooks in the field of the course                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)                           | <p>I. Nuić, M. Trgo, N. Vukojević Medvidović, The application of the packed bed reactor theory to Pb and Zn uptake from the binary solution onto the fixed bed of natural zeolite, Chemical Engineering Journal, 295 (2016) 347-357.</p> <p>I. Nuić, M. Trgo, J. Perić, N. Vukojević Medvidović Uptake of Pb and Zn from a binary solution onto different fixed bed depths of natural zeolite - the BDST model approach, Clay minerals, 50 (2015) 91-101.</p> <p>M. Ugrina, N. Vukojević Medvidović, J. Perić, M. Trgo, A study of kinetics and successive sorption/desorption of Zn and Cd uptake onto iron-modified zeolite, Clay minerals 50 (2015) 117-132.</p> <p>I. Nuić, M. Trgo, J. Perić, N. Vukojević Medvidović, Analysis of breakthrough curves of Pb and Zn sorption from binary solutions on natural clinoptilolite, Microporous and Mesoporous Materials, 167 (2013) 55-61.</p> <p>M. Kragović, A. Daković, Ž. Sekulić, M. Trgo, M. Ugrina, J. Perić, G. D. Gatta, Removal of lead from aqueous solutions by using the natural and Fe(III)-modified zeolite, Applied Surface Science, 258 (2012) 8, 3667-3673.</p> |
| Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)                                 | <p>Leader researcher HZZZ IP-11-2013-4981, NAZELLT -Natural zeolites as a reactive barrier for landfill leachate treatment, 2014.-2018.</p> <p>Bilateral Croatian-Slovenian project: Application of Natural Zeolite for Remediation of Mercury Contaminated Soil, 2016</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

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|                                                                                                                                                                                                                    | 2018., researcher.<br>Bilateral Croatian-Serbian project: Low-cost sorbents as a potential materials for in situ remediation of heavy-metal contaminated groundwater, 2016.-2018., suradnica.<br>Technology transfer infrastructure in the Croatian Adriatic region - „TTAdria”, IPA2007/HR/16IPO/001-040516, nositelj projekta Sveučilište u Splitu, 2013. – 2015., suradnica. |
| The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoške kompetencije?                    |                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>PRIZES AND AWARDS, STUDENT EVALUATION</b>                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                 |
| Prizes and awards for teaching and scholarly/artistic work                                                                                                                                                         | Award "Vera Johanides", 2006, for young scientists, Croatian Academy of Engineering.                                                                                                                                                                                                                                                                                            |
| Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated) |                                                                                                                                                                                                                                                                                                                                                                                 |

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|---------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| First and last name and title of teacher                                                    | <b>Ph. D. Nediljka Vukojević Medvidović, Associate Professor</b>                                                                                                              |
| The course he/she teaches in the proposed study programme                                   | Process Design in Food Industries                                                                                                                                             |
| <b>GENERAL INFORMATION ON COURSE TEACHER</b>                                                |                                                                                                                                                                               |
| Address                                                                                     | Ruđer Bošković 35, 21000 Split                                                                                                                                                |
| Telephone number                                                                            | 021-329-452                                                                                                                                                                   |
| E-mail address                                                                              | nvukojev@ktf-split.hr                                                                                                                                                         |
| Personal web page                                                                           | <a href="http://tkojetko.irb.hr/znanstvenikDetalji.php?sifznan=19202">http://tkojetko.irb.hr/znanstvenikDetalji.php?sifznan=19202</a>                                         |
| Year of birth                                                                               | 1976                                                                                                                                                                          |
| Scientist ID                                                                                | 243570                                                                                                                                                                        |
| Research or art rank, and date of last rank appointment                                     | Scientific advisor, November, 2013                                                                                                                                            |
| Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment | Associate professor, November, 2012                                                                                                                                           |
| Area and field of election into research or art rank                                        | Area of Technical Science, field of chemical engineering                                                                                                                      |
| <b>INFORMATION ON CURRENT EMPLOYMENT</b>                                                    |                                                                                                                                                                               |
| Institution where employed                                                                  | Faculty of Chemistry and Technology                                                                                                                                           |
| Date of employment                                                                          | 01 March, 2001                                                                                                                                                                |
| Name of position (professor, researcher, associate teacher, etc.)                           | Associate professor                                                                                                                                                           |
| Field of research                                                                           | Lecturer and research work within the field of chemical and environmental engineering                                                                                         |
| Function                                                                                    | Head of Department of Environmental Engineering (2013-today)<br>Leader researcher on bilateral Croatian-Serbian project<br>Researcher on bilateral Croatian-Slovenian project |

|                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
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|                                                                                                                                                       | Researcher on project financed by Croatian Science Foundation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>INFORMATION ON EDUCATION – Highest degree earned</b>                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Degree                                                                                                                                                | Doctor of Science, (PhD of technical sciences, chemical engineering)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Institution                                                                                                                                           | Faculty of Chemistry and Technology                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Place                                                                                                                                                 | Split                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Date                                                                                                                                                  | 25 May, 2007                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>INFORMATION ON ADDITIONAL TRAINING</b>                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Year                                                                                                                                                  | 2006                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Place                                                                                                                                                 | Sofia, Bulgaria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Institution                                                                                                                                           | Institute of Organic Chemistry - Bulgarian Academy of Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Field of training                                                                                                                                     | Instrumental Analysis: X-ray, IR and Raman Spectroscopy Application                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Year                                                                                                                                                  | 2004                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Place                                                                                                                                                 | Motovun, Croatia                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Institution                                                                                                                                           | Faculty of Chemical Engineering and Technology in Zagreb & National Institute for Chemistry in Ljubljana                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Field of training                                                                                                                                     | International school of ion chromatography                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Year                                                                                                                                                  | 2000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Place                                                                                                                                                 | Tokyo, Japan                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Institution                                                                                                                                           | National Environmental Training Institute in Tokyo                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Field of training                                                                                                                                     | Environmental monitoring, Water Quality                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Year                                                                                                                                                  | 1998                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Place                                                                                                                                                 | Krakow, Poland                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Institution                                                                                                                                           | AGH University of Mining and Metallurgy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Field of training                                                                                                                                     | Characterization of coal and coke                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>MOTHER TONGUE AND FOREIGN LANGUAGES</b>                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Mother tongue                                                                                                                                         | Croatian                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)                                                      | English (5)<br>French (3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>COMPETENCES FOR THE COURSE</b>                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme) | <p>Advanced wastewater treatment (2008-2009), lecture, postgraduate study, Faculty of Chemistry and Technology, University of Split</p> <p>Process design, (2002- today), seminar, graduate study, Faculty of Chemistry and Technology, University of Split</p> <p>Wastewater engineering, (2009-today), seminar, laboratory exercise, graduate study, Faculty of Chemistry and Technology, University of Split</p> <p>Wastewater treatment (2015-today), lecture, seminar, graduate study, Faculty of Chemistry and Technology, University of Split</p> <p>Water protection (2008–today), lecture, seminar, laboratory exercise, undergraduate study, Faculty of Chemistry and Technology, University of Split</p> <p>Industrial wastewater, (2008–today), lecture, seminar, laboratory exercise, professional study, Faculty of Chemistry and Technology, University of Split</p> |

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|                                                                                                                                                 | <p>Water technology (2008), laboratory exercise, graduate study, Faculty of Chemistry and Technology, University of Split</p> <p>Chemistry and technology of wastewater treatment, (2002-2008), seminar, laboratory exercise, graduate study, Faculty of Chemistry and Technology, University of Split</p> <p>Water in industry (2004-2007), laboratory exercise, Faculty of Chemistry and Technology, University of Split</p> <p>Wastewater treatment (2004-2007), laboratory exercise, Faculty of Chemistry and Technology, University of Split</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Authorship of university/faculty textbooks in the field of the course                                                                           | <p>J. Perić, N. Vukojević Medvidović, I. Nuić, Inženjerstvo otpadnih voda, Priručnik za laboratorijske vježbe, Kemijsko tehnološki fakultet Sveučilišta u Splitu, lipanj 2012. (<a href="http://www.ktf-split.hr/bib/nm/inzenjerstvo_otpadnih_voda.pdf">http://www.ktf-split.hr/bib/nm/inzenjerstvo_otpadnih_voda.pdf</a>).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)                     | <p>I. Nuić, M. Trgo, N. Vukojević Medvidović, The application of the packed bed reactor theory to Pb and Zn uptake from the binary solution onto the fixed bed of natural zeolite, <i>Chemical Engineering Journal</i> 295 (2016) 347–357.</p> <p>M. Ugrina, N. Vukojević Medvidović, J. Perić, M. Trgo, A study of kinetics and successive sorption/desorption of Zn and Cd uptake onto iron-modified zeolite, <i>Clay minerals</i> 50 (2015) 117-132.</p> <p>N. Vukojević Medvidović, J. Perić, Jelena; M. Trgo, I. Nuić, M. Ugrina. Design of the fixed bed column for lead removal on natural zeolite based on batch studies.// <i>Chemical and biochemical engineering quarterly</i>. 27 (2013) , 1; 21-28.</p> <p>N. Vukojević Medvidović, M. Ugrina, J. Perić, M. Trgo, I. Nuić, I. Ivanković, Dimensional analysis as a useful tool in determining the relationship between sorption phenomena and the solid/liquid ratio// <i>Danas znanost - sutra industrija : zbornik radova / Jukić, Ante (ur.)</i>. Zagreb, Osijek : Hrvatsko društvo kemijskih inženjera i tehnologa, Prehrambeno tehnološki fakultet, 2012. 405-414.</p> <p>N. Vukojević Medvidović, J. Perić, M. Trgo, Marina, M. Ugrina, M. Sikavica, Modified natural zeolite as a promising material for in situ environmental remediation//<i>Proceedings of XIIth International Symposium Waste Management/XII. međunarodni simpozij gospodarenja otpadom / Anić Vučinić, Aleksandra (ur.)</i>. Zagreb: Geotehnički fakultet, 2012. 41-CD ROM.</p> |
| Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most) |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)                           | <p>Leader researcher in bilateral Project with Institute for technology of nuclear and other mineral resources, Beograd, Republic of Serbia: "Low-cost sorbents as a potential materials for <i>in situ</i> remediation of heavy-metal contaminated groundwater", 2016-2017.</p> <p>Collaborator in bilateral project with Geological Department of Slovenia, Ljubljana, Slovenia, Application of natural zeolite for remediation of mercury contaminated soil, 2016-2017 (Project leader: PhD Ivona Nuić).</p> <p>Collaborator in project HRZZ Research Projects (IP-11-2013-4981) Natural zeolites as a reactive barrier for landfill leachate treatment-NAZELLT, 2014-2018 (Project leader: PhD Marina Trgo, full professor)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

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|                                                                                                                                                                                                                    | Collaborator in project "Natural zeolite in water protection", Ministry of Science, Education and Sports of the Republic of Croatia, Croatia, 2007-2013 (Project leader: PhD Jelena Perić, professor emeritus)                                                                                                                                                           |
| The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoške kompetencije?                    | "The development of the skills and methods of working with young people" - training organized within the two-year project "Students learn citizenship - Service-Learning for nature conservation and environmental protection (a German-Croatian cooperation project)" - Association for Nature, Environment and Sustainable Development Sun, Split, 17th-18th May 2016. |
| <b>PRIZES AND AWARDS, STUDENT EVALUATION</b>                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                          |
| Prizes and awards for teaching and scholarly/artistic work                                                                                                                                                         | Award of Faculty for academic year 1994/95<br>Award of Faculty for academic year 1996/97<br>Award of Faculty for academic year 1997/98<br>Recognition for promotion of the Faculty of Chemistry and Technology in Split for academic year 2011/2012                                                                                                                      |
| Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated) | University of Split, EvaSys Evaluation, Average grade 4.4.-5.0 on in grading scale 1.0-5.0. Course evaluated: Wastewater engineering, Wastewater treatment, Industrial wastewater, Process design, Water protection                                                                                                                                                      |

### 3.3. Optimal number of students

The optimal number of students in the graduate study of Food Technology in terms of space, equipment and number of full-time teachers is 24 and represents the proposed admission quota.

### 3.4. Estimate of costs per student

Average annual tuition fee per student amount about 31,500.00 kunas.

### 3.5. Plan of procedures of study programme quality assurance

In keeping with the European standards and guidelines for internal quality assurance in higher education institutions (according to "Standards and Guidelines of Quality Assurance in the European Higher Education Area") on the basis of which the University of Zagreb defines procedures for quality assurance, the proposer of the study programme is obliged to draw up a plan of procedures of study programme quality assurance.

**Documentation on which the quality assurance system of the constituent part of the University is based:**

Regulations on the quality assurance system of the constituent part (enclose if existing)

Handbook on the quality assurance system of the constituent part (enclose if it exists)

**Description of procedures for evaluation of the quality of study programme implementation:**



For each procedure the method needs to be described (most often questionnaires for students or teachers, and self-evaluation questionnaire), name the body conducting evaluation (constituent part, university office), method of processing results and making information available, and timeframe for carrying out evaluation

If procedure is described in an attached document, name the document and the article.

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| Evaluation of the work of teachers and part-time teachers                                               | The process of student evaluation of the teaching quality is conducted by the Quality Enhancement Centre (at the level of the University) and the Quality Enhancement Committees (at the level of constituents). The procedure consists of informing students and teachers, student survey questionnaire, the processing of the questionnaires and reporting on the results, the adoption of measures to improve quality. The procedure is described in detail in the Regulations on the procedure for student evaluation of teaching at the University of Split. The processing of the questionnaires and reporting on the results are under jurisdiction of the Quality Enhancement Centre. Summary results for the each constituent are submitted to the Dean and the leader of the Quality Enhancement Committee. |
| Monitoring of grading and harmonization of grading with anticipated learning outcomes                   | Procedures, rules and criteria for grading of students include: method for taking the exams, requirements for taking the exams, method of evaluation through colloquia, seminars, active participation in classes, exams and other obligations, conditions for signature, a list of references for exam preparation, and data about the teacher, assistant, etc. Informations about procedures, rules and criteria for grading students can found on the website of the Faculty and at the introductory lectures.                                                                                                                                                                                                                                                                                                     |
| Evaluation of availability of resources (spatial, human, IT) in the process of learning and instruction | The Faculty provides adequate and appropriate educational resources for the study program and support for teaching and non-teaching activities of students, which are consistent with the specific programs and student needs and readily accessible to students (equipped classrooms, library, computer classrooms, and support for students with disabilities).                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Availability and evaluation of student support (mentorship, tutorship, advising)                        | Student evaluation of the teaching quality, student survey questionnaire.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Monitoring of student pass/fail rate by course and study programme as a whole                           | Analysis of student success at the study is conducted by Quality Enhancement Centre of the University of Split. The analysis is carried annually by survey questionnaire at the beginning of the academic year for the previous academic year. The results of the analysis and measures to improve student success are presented to the Senate of the University of Split by leader of the Quality Enhancement Centre. Likewise, ISVU system allows the student service and ISVU coordinator to keep track of student pass/fail rate by course and study programme as a whole.                                                                                                                                                                                                                                        |
| Student satisfaction with the programme as a whole                                                      | Quality Improvement Centre of the University of Split has defined the procedure for conducting a survey on the evaluation of the overall study. The student survey questionnaire for evaluation of the study is conducted by the platform Evasys but after the student has passed the                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |



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|                                                                                                                            | final exam. The aim of the survey is to hear the opinion of students on various aspects of the study which they have completed and to determine flaws in order to increase the quality of the content and implementation of the study. Data is conducted by Quality Enhancement Centre and results are submitted to the Head of Department and to leader of the Quality Enhancement Centre. |
| Procedures for obtaining feedback from external parties (alums, employers, labour market and other relevant organizations) | Former students are contacted in order to express their assessment of the qualifications for the professional requirements. Selected employers can be contacted as well in order to assess their satisfaction with students which have been studying at this the study program. Regular exchange of information at conferences organized by the ALUMNI of the Faculty (AMACTFS).            |
| Evaluation of student practical education (where this applies)                                                             | Evaluation of student training is conducted orally by the course teacher. At the same time the student must submit the log and seminar about selected topic of professional practice.                                                                                                                                                                                                       |
| Other evaluation procedures carried out by the proposer                                                                    | Formal and informal consultation with colleagues in the profession at the Faculty level and beyond.                                                                                                                                                                                                                                                                                         |
| <b>Description of procedures for informing external parties on the study programme (students, employers, alums)</b>        | Results are available on the official web site of the Faculty ( <a href="https://www.ktf.unist.hr">https://www.ktf.unist.hr</a> ) Brochure (revised annually) The University review. Universitas – supplement of the Slobodna Dalmacija about the University of Split. The participation of staff and students of the Faculty at the Science Festival and similar events.                   |