U N I V E R S I T Y O F S P L I T

FACULTY OF CHEMISTRY AND TECHNOLOGY

Undergraduate study

Food Technology

SPLIT, February, 2014.

GENERAL INFORMATION OF HIGHER EDUCATION INSTITUTION

Name of higher education institution	Faculty of Chemistry and Technology, University of Split
Address	Teslina 10/V, 21000 Split
Phone	021/ 329 420
Fax	021/ 329 461
E.mail	dekanat@ktf-split.hr
Internet address	www.ktf-split.hr

GENERAL INFORMATION OF THE STUDY PROGRAMME

Name of the study programme	Food Technology		
Provider of the study programme	Faculty of Chemistry and Technology, University of Split		
Other participants	-		
Type of study programme	Vocational study programme□	University study programme☒	
Level of study programme	Undergraduate☒	Graduate□	Integrated□
	Postgraduate□	Postgraduate specialist□	Graduate specialist□
Academic/vocational title earned at completion of study	Bachelor of Food Technology		

1. INTRODUCTION

1.1. Reasons for starting the study programme

The Faculty of Chemistry and Technology in Split has been implementing study programmes in the field of food technology and engineering since 1980s, through different major fields of study and university and professional level courses, placing special emphasis on Mediterranean orientation and agricultural crops. Following the recent reform of the study programmes, in line with the Bologna Process, the university graduate study of Chemical Technology offers courses in Mediterranean Cultures. The core subjects of the field of study include food technology, and the academic title awarded following the completion of the studies is *Master of Chemical Engineering*, subject field Mediterranean Cultures. In parallel, within the framework of the professional study programme in Chemical Technology, a course in Food Technology is offered, awarding a title of *Associate of Chemical Engineering*. Accordingly, by introducing the undergraduate study programme in chemical technology, the existing professional study programme would be terminated, followed by necessary reorganisation of graduate studies.

One of the strategic goals of the Republic of Croatia is development of food industry that can provide incentive for strong economic growth and more intensive regional cooperation. Coastal area of Croatia and the surrounding territories offer optimal conditions (mild climate, unpolluted soil and water) for food production, and these benefits need to be used to our advantage, as they are so rare in the rest of Europe.

One important reason for proposing this study programme is a lack of undergraduate study programme in food technology in the coastal parts of Croatia, although the region offers significant potential in food production and processing. According to data provided by the Croatian Chamber of Commerce in Split, there is a steady growth in the number of small food processing and production facilities. Small production facilities are mostly engaged in production and processing of food (olives, figs, grapes, spices and medicinal herbs…). The proposal for undergraduate study of food technology is oriented specifically to production technology of products typical for the coastal area, and as such provides a wide range of employment opportunities,

whether in existing companies, or through establishing small specialised processing facilities.

The proposed undergraduate study programme Food Technology would educate experts earning the following qualification at completion of studies *Bachelor of Food Technology,* thus enabling them recognisability at the labour market. Suitably educated experts are a necessary prerequisite of success in the field of food technology.

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

With the aim of offering quality education, and equipping the students with practical knowledge necessary for gaining qualifications, the undergraduate study programme in Food Technology is in close correlation with the local community. The correlation shall be manifested through cooperation with the existing companies in the field of food technology, offering field work courses and practical courses for students, cooperation with the County administration institutions (Regional Development Agency of Split-Dalmatia County, RERA), professional associations (Dalmatian Association of Olive Tree Growers and Olive Oil Producers, the Association “Plavac mali”) and Cooperative Alliance of Dalmatia that provide support to introducing this study programme at the Faculty of Chemistry and Technology in Split.

1.3. Compatibility with requirements of professional organizations

One of the crucial points of the proposed study programme is consolidation with the recommendations of professional associations, namely the Dalmatian Association of Olive Tree Growers and Olive Oil Producers and Cooperative Alliance of Dalmatia and the Association “Plavac mali”. This is manifested through specific focus of the study programme on processing of food products typical for the Mediterranean area (olives, grapes, other fruit and vegetables, aromatic herbs). Defined orientation of the study programme shall contribute to education of young professionals that would use their knowledge to advance the work of professional associations, as well as promotion of local food products.

1.4. Name possible partners outside the higher education system that expressed interest in the study programme

Potential partners outside higher education system that have expressed interest for cooperation and/or support introduction of the study programme:

- Split-Dalmatia County Institute of Public Health, Food Control Department
- the Association “Plavac mali”
- Croatian Chamber of Commerce
- Dalmatian Association of Olive Tree Growers and Olive Oil Producers
- Cooperative Alliance of Dalmatia
- Regional Development Agency of Split-Dalmatia County (RERA)
- Town of Split

1.5. Financing

The planned source of financing for the undergraduate study programme Food Technology is the Ministry of Science, Education and Sports. The Faculty of Chemistry and Technology currently offers professional study programme in Chemical Technology, field of study: Food Technology, fully financed by the Ministry of Science, Education and Sports. Furthermore, the Faculty of Chemistry and Technology currently offers undergraduate study programme in Chemical Technology, field of study: Chemical Engineering, with admission quota of 90 students. With introduction of the undergraduate study programme Food Technology, the admission quota would be proportionally reduced; therefore the introduction of the new programme Food Technology would not require any additional funds.

1.6. Comparability of the study programme with other accredited programmes in higher education institutions in the Republic of Croatia and EU countries

The proposed study programme Food Technology is basically comparable with the study programmes in food technology at the universities in Zagreb and Osijek. However, the specific nature of the proposed programme lies in its Mediterranean orientation. Furthermore, the study programme is comparable with the study programme in food technology at the University of Ljubljana, the study programme at Cork University and University of Technology in Munich, Germany:

http://www.ucc.ie/en/study/undergrad/what/sefs/foodsci/;
http://www.studienfakultaet.de/content/stundenplaene.

1.7. Openness of the study programme to student mobility (horizontal, vertical in the Republic of Croatia, and international)

The study programme is organized in one-semester courses, which is one of the important prerequisites of student mobility. The programme compatibility between the undergraduate study Food Technology and similar studies provides the students with an opportunity to attend one part of the courses at other related faculties in Croatia or abroad. Consequently, the study is open towards student mobility at the University of Split as well as among other universities in Croatia with similar studies, but also towards student mobility in the wider region of Europe (e.g. through ERASMUS programme). Student mobility at national level is an assumption for quality mobility at the international level.

1.8. Compatibility of the study programme with the University mission and the strategy of the proposer, as well as with the strategy statement of the network of higher education institutions

Preparation of this study programme is in accordance with mission, vision and goals that are partly related to the University of Split Scientific Strategy 2009-2014, encouraging the university constituents to create their own internal development plans. The proposed study programme Food Technology is the only one of this type at the University of Split and in the wider region.

The proposed professional study programme is in agreement with the Faculty of Chemistry and Technology Development Strategy 2008 – 2013: implementation and optimising adopted study programmes in all fields of study, achieving compatibility with other Croatian and European higher education institutions and introduction of new educational programmes. **Task 1.1 –** Maintain and achieve effective ratio of different study programmes and modules. *Indicator 1.1a* – Number of accredited study programmes and modules. *Indicator 1.1b:* Percentage of flexible academic programmes. **Task 1.2***:* Consolidate the ratio of a number of students at professional and university study programmes with labour market demands. *Indicator 1.2a* – Type of study programme (professional – university). *Indicator 1.2b*: Number and distribution (professional - university) of students - Benchmark indicator! **Task 1.4**:

Establish undergraduate study of Mediterranean Cultures (Food Technology). *Indicator 1.4*: Formation document for the undergraduate study programme Mediterranean Cultures (Food Technology). **Task 1.8:** Increase enrolment rate from the 1st to 2nd year of study to 75% and maintain enrolment rate at over 90% at senior years of study. *Indicator 1.8*: Percentage of student successfully completing the first year of study. **Task 1.14:** Increase the number of students coming from wider region, outside the vicinity of the University of Split. *Indicator 1.14:* Percentage of students coming from other counties.

1.9. Current experiences in equivalent or similar study programmes

Faculty of Chemistry and Chemical Technology has had a few decade experiences in professional study in food technology.

2. DESCRIPTION OF THE STUDY PROGRAMME

2.1. General information

Scientific/artistic area of the study programme	Biotechnical sciences
Duration of the study programme	3 years (6 semesters)
The minimum number of ECTS required for completion of study	180
Enrolment requirements and admission procedure	Completed 4-year secondary school and secondary school leaving exam.

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

Bachelor of food technology would be able to:

- apply an appropriate approach to dissolve the problems using basic knowledge of mathematics, physics or chemistry
- work in the laboratory in safe and professional manner
- analyse and present collected data and results of measurement using personal computer

- list the main characteristics of food types and principles of healthy diet
- identify characteristics of raw materials for the food stuffs
- choose the appropriathe method for food analyses
- distinguish the types of reactors in food industry
- apply different metods for food conservation according good manufacturing practice
- determine and apply the categorization of raw materials, technological processes and products in food industry
- calculate the normatives necessary for processing organization in food industry
- recognize and solve the problems in technological processes of food industry
- recognize the critical control points of the process and analyse risks, apply preventional and corrective measures to ensure food safety
- apply basic law regulations from the field of food technology
- identify the sources of the waste in food industry and suggest the method of waste disposal
- apply the sanitary measures in food industry facilities
- identify the interaction in food-packaging systems
- design creative packaging solutions
- participate in the team work and independently present the professional materials.

2.3. Employment possibilities

- Croatian Chamber of Economy
- Regional Development Agency of Split-Dalmatian County
- Trenton d.o.o.
- Bioplan d.o.o.
- Dalmaconsult d.o.o.
- Lavanda d.o.o.
- Vinoline d.o.o.
- Vinarium d.o.o.
- Herba Dalmatica d.o.o.
- Dalmacija eko d.o.o.
- Sardina d.d. Postira

- Dalmed d.d.
- Apidal d.o.o.
- Olma Topić d.o.o.
- Bimita d.o.o.
- Babić d.o.o.
- Novak Makarska d.o.o.

2.4. Possibilities of continuing studies at a higher level

Higher level studies are possible at the corresponding graduated studies in Croatia and abroad as well.

2.5. Name lover level studies of the proposer or other institutions that qualify for admission to the proposed study

Not applicable.

2.6. Structure of the study

STUDY PROGRAMME STRUCTURE

Within the structure of the undergraduate study programme Food Technology, core courses are placed in the first four semesters, while the fifth and sixth semesters contain core and elective courses. With the aim of continuous improvement of the programme, updating of core and elective courses can be achieved by adding new ones. A new course is proposed by the professor to the Teaching Committee which has the authority to act towards the Faculty Council of Faculty of Chemistry and Technology. Following the second year of study, students take practical courses. The study programme is completed after passing all the exams and drafting and defending the final thesis.

ECTS

All courses are one-semester courses, carrying an appropriate number of ECTS credits. During the evaluation of ECTS credits, objective course workload and course professor estimate was taken into account. In case of subjects that are shared with the existing study programmes, the results of a student survey on awarding ECTS credits was also taken into consideration.

2.7. List of courses that the student can take in other study programmes

With the aim of continuing and extending their education, and strengthening and supporting professional training, especially in the context of raising awareness on the interrelation between faculties and universities, students may take courses from other study programmes that offer courses that relate or overlap with the topic of interest of this study programme. The procedure for selecting courses from other faculties is defined in the *Ordinance on study programmes and course attendance system at the Faculty of Chemistry and Technology in Split.*

2.8. List of courses offered in a foreign language as well (name which language)

As a rule, the lectures and courses held at the study programme Food Technology shall be provided in Croatian language. Since there are courses included in the programme that are proposed to be taught in English, as necessary these courses will be provided in English.

2.9. Criteria and conditions for transferring the ECTS credits

The criteria and requirements for the transfer of ECTS credits are regulated by the *Ordinance on study programmes and course attendance system at the University of Split, Statute of the Faculty of Chemistry and Technology in Split* and *Ordinance on study programmes and course attendance system at the Faculty of Chemistry and Technology in Split.*

2.10. Completion of study

Final requirement for completion of study	Final thesis x Diploma thesis ☐	Final exam x Diploma exam ☐
Requirements for final/diploma thesis or final/diploma/exam	Requirements for final thesis are regulated by the *Ordinance on study programmes and course attendance system at the Faculty of Chemistry and Technology in Split.*	
Procedure of evaluation of final/diploma exam and evaluation and defence of final/diploma thesis	Procedure of evaluation of final/diploma exam is regulated by the *Ordinance on final thesis/diploma thesis at the Faculty of Chemistry and Technology in Split.*	

2.11. List of mandatory and elective courses

List of courses							
Year of study: 1st							
Semester: 1st							
STATUS	CODE	COURSE	HOURS IN SEMESTER				ECTS
			L	S	E	F	
Mandatory	KTK 101	Mathematics	30	45	0	0	8.0
	KTK 102	Physics	30	15	30	0	6.0
	KTK 103	General Chemistry	45	30	30	0	9.0
	KTJ 111	General Biology	30	15	0	0	4.0
	KTK 104	Computers Application	15	0	30	0	3.0
	Total		150	105	90	0	30

List of courses							
Year of study: 1st							
Semester: 2nd							
STATUS	CODE	COURSE	HOURS IN SEMESTER				ECTS
			L	S	E	F	
Mandatory	KTK 105	General Microbiology	30	0	15	0	4.0
	KTK 106	Inorganic Chemistry	30	15	30	0	7.0
	KTK 107	Analytical Chemistry	60	15	45	0	9.0
	KTK 108	Food and Nutrition	30	15	0	0	4.0
	KTK 109	Physical Chemistry	30	15	30	0	6.0
	Total		180	60	120	0	30

List of courses							
Year of study: 2nd							
Semester: 3rd							
STATUS	CODE	COURSE	HOURS IN SEMESTER				ECTS
			L	S	E	F	
Mandatory	KTK 201	Organic Chemistry	60	15	45	0	10.0
	KTK 202	Food Microbiology	30	0	15	0	5.0
	KTK 203	Transport Phenomena	45	15	15	0	6.0
	KTK 204	Introduction to Food Technology	15	15	0	0	3.0

	KTK 205	Raw Materials in Food Industry	30	15	0	0	4.0
	Total		180	60	75	0	28

List of courses							
Year of study: 2nd							
Semester: 4th							
STATUS	CODE	COURSE	HOURS IN SEMESTER				ECTS
			L	S	E	F	
Mandatory	KTK 206	Biochemistry	45	15	30	0	7.0
	KTK 207	Unit Operations	45	15	30	0	7.0
	KTK 208	Thermodynamics	15	15	0	0	3.0
	KTK 209	Measuring and Control Technique	30	0	30	0	5.0
	KTK 210	Processes in Food Industry	45	15	30	0	7.0
	KTK OSP	Professional Practice	10 days				3.0
	Total		180	60	75	0	32

List of courses							
Year of study: 3rd							
Semester: 5th							
STATUS	CODE	COURSE	HOURS IN SEMESTER				ECTS
			L	S	E	F	
Mandatory	KTK 301	Food Chemistry	45	15	45	0	8.0
	KTK 302	Quality Managment	30	30	0	0	5.0
	KTK 303	Hygiene and Sanitation	30	15	15	0	5.0
	Total		165	90		0	18.0
Elective Group A	KTK 304	Olive Processing Technologies	30	15	20	10	6.0
	KTK 305	Technology of Grape Products	30	15	25	5	6.0
	KTK 306	Fruit and Vegetable Processing	30	15	25	5	6.0
	KTK 307	Seafood Processing Technology	30	15	20	10	6.0
	KTK 308	Milk and Dairy Products Technology	30	15	25	5	6.0
	KTK 309	Processing Technology of Herbs and Spices	30	15	30		6.0
	KTK 310	Methods of Food Analysis	30	15	30		6.0
	ECTS sum must be minimum 12.						

List of courses							
Year of study: 3rd							
Semester: 6th							
STATUS	CODE	COURSE	HOURS IN SEMESTER				ECTS
			L	S	E	F	
Mandatory	KTK 311	Basic Biotechnology	30	0	0	0	3.0
	KTK 312	Food Packaging	30	0	15	0	4.0
	KTK 313	Water Technology	30	15	30	0	5.0
	KTK OZR	Final thesis					10.0
	Total						22.0
Elective Group B	KTK 314	Food Product Development	15	30	0	0	4.0
	KTK 315	Food Industry Waste Engineering	30	0	15	0	4.0
	KTK 316	Mineral Raw Materials from Seawater	30	0	15	0	4.0
	KTK 317	Safety at Work	30	0	15	0	4.0
	KTA 318	Introduction to Entrepreneurship	30	15	0	0	4.0
	ECTS sum must be minimum 8.						

2.12. Course description

Mathematics

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="6">Mathematics</td></tr>
<tr><td>Code</td><td>KTK101</td><td>Year of study</td><td colspan="5">1st year</td></tr>
<tr><td>Course teacher</td><td>Dr. Tanja Vučičić, associate professor</td><td>Credits (ECTS)</td><td colspan="5">8.0</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Lucija Ružman, assistant</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>F</td></tr>
<tr><td>30</td><td>45</td><td></td><td></td></tr>
<tr><td>Status of the course</td><td>Obligatory</td><td>Percentage of application of e-learning</td><td colspan="5"></td></tr>
<tr><td colspan="8">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="7">To introduce students to the basic elements of calculus and linear algebra.</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="7"></td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="7">After finishing this course the student is expected to be able to:
• identify and sketch graphs of elementary functions, to determine the domain of the given function
• find the derivative of the given function
• apply the dervative in practice (tangents and normals, maximum, minimum and inflection points) and to interpret the shape of graphs
• apply the techniques of integration (integration by substitution, integration by parts)
• use the definite integral in its geometrical applications
• solve the system of linear equations (by matrix inversion, by Gaussian elimination)</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="7">1. Sets: Notion. Algebra of sets. Sets of numbers.
2. Functions: Notion. Composite functions. Inverse function.
3. Elementary functions.
4. Sequences: Notion. Limits. Functions: Limits. Continuity.
5. Derivative and application: Notion. Interpretation. Derivative techniques.
6. Differential. Higher order derivatives.
7. Theorems of differential calculus. Maximum, minimum points.
8. Inflection points. Asymptotes. Graphs sketching.
9. Integral and its application: Indefinite integral. Techniques of integration.
10. Definite integral.
11. Application of definite integral.
12. Matrices and vectors: Matrix algebra. Determinants. Inverse matrix.
13. Linear systems of equations.
14. Vector algebra.
15. Course review. Revision.</td></tr>
<tr><td>Format of instruction</td><td colspan="3">✕ lectures
✕ seminars and workshops
☐exercises
☐on linein entirety
☐partial e-learning</td><td colspan="4">☐independent assignments
✕multimedia
□laboratory
□work with mentor
□ (other)</td></tr>
</table>

	☐field work					
Studentresponsibilities	Regular attendance of classes.					
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	3	Research		Practical training	
	Experimental work		Report		(Other)	
	Essay		Seminar essay		(Other)	
	Tests	2	Oral exam	1,5	(Other)	
	Written exam	1,5	Project		(Other)	
Grading and evaluating student work in class and at the final exam	Examination: either by continuously checking and grading students' progress during the semester or in exam terms by passing written and oral exam. At the beginning of the course students will be informed of in detail elaborated rules for both models of examination.					

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	T. Bradić, i dr., Matematika za tehnološke fakultete, Element, Zagreb (više izdanja)	47	
	B.P. Demidovič, Zadaci i riješeni primjeri iz više matematike, Tehnička knjiga, Zagreb (više izdanja)	5	

Optional literature (at the time of submission of study programme proposal)	S. Kurepa, Matematička analiza I i II dio, Školska knjiga, Zagreb, 1997. I. Slapničar, Matematika 1, Fakultet elektrotehnike, strojarstva i brodogradnje u Splitu, Sveučilište u Splitu, Split, 2002. (http://lavica.fesb.hr/mat1) I. Slapničar, Matematika 2, Fakultet elektrotehnike, strojarstva i brodogradnje Sveučilišta u Splitu, Split, 2008. (http://lavica.fesb.hr/mat2) Hughes-Hallett, Gleason et al., Calculus, John Wiley and Sons, Inc., New York, 2000.
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)	

Physics

<table>
<tr><th>COURSE NAME</th><th colspan="5">Physics</th></tr>
<tr><td>Course code</td><td>KTK102</td><td>Year of study</td><td colspan="4">1st</td></tr>
<tr><td>Course lecturer</td><td>Mirko Marušić, PhD</td><td>Credits (ECTS)</td><td colspan="4">6.0</td></tr>
<tr><td rowspan="2">Assistants</td><td rowspan="2"></td><td rowspan="2">Type of instruction</td><td>P</td><td>S</td><td>V</td><td>T</td></tr>
<tr><td>30</td><td>15</td><td>30</td><td></td></tr>
<tr><td>Course status</td><td>Obligatory</td><td>Application of e-learning (percentage)</td><td colspan="4"></td></tr>
<tr><th colspan="6">COURSE DESCRIPTION</th></tr>
<tr><td>Course objectives</td><td colspan="5">Acquiring theoretical knowledge and developing the ability to differentiate properties and concepts of classical and modern physics. Creating an adequate attitude towards interpreting physical phenomena and their applications. Mastering the scientific physical approach to experimental observations and methods required in the physical laboratory.</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="5">none</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="5">After passing the exam the student is expected to:
– know basic physical measures and units of measure,
– understand properties of motion and forces in the classical theory,
– be able to identify the characteristics of the exact approach the micro world phenomena,
– understand basic principles of electricity and magnetism, as well as the wave properties of electromagnetic radiation,
– be able to describe the phenomena associated with the dual nature of light,
– understand principles of geometrical and physical optics,
– have basic knowledge of modern physics,
– be able to apply the acquired knowledge to problem-solving tasks,
– be able to use the methods of measuring the chosen physical measures and carry our experiments autonomously,
– have developed the skill of graphic processing of measured data and the skill of writing reports on the experiment conducted and results obtained.</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="5">1st week: Motion and Forces
2nd week: Energy and Work
3rd week: Systems of particles. Rotation.
4th week: Elasticity. Oscillation. Elastic waves.
5th week: Partial assessment (1st preliminary test)
6th week: Molecular-kinetic theory. Heat.
7th week: Fluids. Transport phenomena.
8th week: Electrostatics and Magnetostatics
9th week: Electromagnetism. Electric Current and Electric Circuits.
10th week: Partial assessment (2nd preliminary test)
11th week: Electromagnetic Waves. Light. Geometrical Optics. Optical instruments.
12th week: Physical Optics.
13th week: Elements of Quantum mechanics.
14th week: Laser Light. Radioactivity.
15th week: Partial assessment (3rd preliminary test)

Seminars: Exercises on selected topics (40 - 60 exercises)
Seminars for advanced students on the topics of food physics.</td></tr>
</table>

<table>
<tr><td></td><td colspan="6">Exercises:
Measuring of the basic physical quantities. Taking basic physical measures. Numerical and graphical processing of the measured data. Measurement errors. Torque and moment of inertia. Conservation of energy. Oscillators. Heat capacity. The laws of hydrostatics. Surface phenomena. Electrical circuits. The laws of geometrical optics. The phenomena of physical optics and their applications. Spectroscopy.</td></tr>
<tr><td>Format of instruction</td><td colspan="3">x lectures
□ seminars and workshops
x exercises
□ on line in entirety
□ partial e-learning
□ field work</td><td colspan="3">□ independent assignments
x multimedia
x laboratory
□ work with mentor
x group and individual tutorials
x seminars</td></tr>
<tr><td>Student responsibilities</td><td colspan="6"></td></tr>
<tr><td rowspan="6">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)</td><td>Class attendance</td><td>0.8</td><td>Research</td><td></td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td>1.2</td><td>Report</td><td></td><td>Pre-test preparation classes</td><td>0-4</td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Tests</td><td>1.2</td><td>Oral exam</td><td>1.2</td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td>1.2</td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td colspan="6"></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="6">In course of the semester, the entire exam can be passes by taking and passing the three preliminary tests consisting of theoretical questions as well as practical exercises and 10 laboratory tests.
In the examination periods first written and then oral exam is taken.
Grades: 55-64% - sufficient; 65-79% - good, 80-89% - very good; 90-100% - excellent.</td></tr>
<tr><td rowspan="4">Required literature (available in the library and via other media)</td><td colspan="3">Book title</td><td>Number of books in the library</td><td colspan="2">Available via other media</td></tr>
<tr><td colspan="3">Janko Herak, Osnove kemijske fizike, Farmaceutsko-biokemijski fakultet Sveučilišta u Zagrebu, 2001.</td><td>10</td><td colspan="2">-</td></tr>
<tr><td colspan="3">P. Kulišić, L.Bistričić, D. Horvat, Z. Narančić, T. Petrović i D. Pevec. Riješeni zadaci iz mehanike i topline. Školska knjiga, Zagreb, 2002.</td><td>10</td><td colspan="2">-</td></tr>
<tr><td colspan="3">E. Babić, R. Krsnik, M. Očko, Zbirka riješenih zadataka iz fizike, Školska knjiga Zagreb, Zagreb, 1990.</td><td>10</td><td colspan="2">-</td></tr>
<tr><td>Optional literature</td><td colspan="6">D. Halliday, R. Resnick, Fundamentals of Physics, John Wiley, New York, 2003.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="6">Quality of the teaching and learning, monitored at the level of the
(1) teachers, accepting suggestions of students and colleagues, and
(2) faculty, conducting surveys of students on teaching quality.</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="6"></td></tr>
</table>

General Chemistry

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="6">General Chemistry</td></tr>
<tr><td>Code</td><td>KTK103</td><td>Year of study</td><td colspan="5">1.</td></tr>
<tr><td>Course teacher</td><td>dr. sc. Slobodan Brinić, associate professor
dr. sc. Zoran Grubač, full professor</td><td>Credits (ECTS)</td><td colspan="5">9</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2"></td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>F</td></tr>
<tr><td>45</td><td>30</td><td>30</td><td></td></tr>
<tr><td>Status of the course</td><td></td><td>Percentage of application of e-learning</td><td colspan="5"></td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">To familiarize students with the basic chemical laws and principles and to enable students to master the chemical items that follow General Chemistry. To develop students ability to think critically about the experiments performed in the laboratory and about the involvement of of chemistry in everyday life.</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">-</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">After the the course students will be able to:
1) Understand the nature and properties of the substance, differentiate elementary substances from compounds, distinguish homogeneous from heterogeneous mixtures, assume procedures for separating mixtures into pure substances.
2) Understanding the problem-solving approach to the balance of substances in chemical changes
3) Understand the structure of atoms and existing models of chemical bonds in such way that they can predict certain properties and reactivity of chemical elements and their ionic and covalent compounds
4) Discern the nature of certain chemical reactions.
5) Adopt the concept of pH, and assume direction of the chemical reactions on the basis of knowledge of chemical kinetics and equilibrium.
6) Independently and safely perform simple chemical experiments</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="6">Lectures:
1. Introduction - Natural sciences and chemistry. Units of measurement and measurement. Classification of matter. Pure substance. Decomposition of the substance to the pure substance.
2. Properties of a pure substances, physical and chemical properties. Atom and chemical element. The chemical symbols of elements. The laws of chemical combination by weight and volume. The atomic theoryes from the early ideas to John Dalton. Avogadro's hypothesis.
3. The discovery of the structure of atoms. The discovery of X-rays and radioactivity. Rutherford model of the atom. X-rays and crystal structure. Bragg equation. Isotopes and the structure of the atomic nucleus.
4. The structure of pure substances. The atomic structure of substances. Types of a crystal systems and crystal characteristics. Cubic crystal system. The molecular structure of substances. The nature of the gas. The nature of the fluid. The concept of temperature. The kinetic theory of gases.
5. Gas laws and the equation of state of an ideal gas. Real gases. Relative atomic and molecular weight. Methods for determining relative atomic (Dulong - Petit method, X-ray diffraction, mass spectrograph) and molecular weight (density of the gas, the method of Victor Mayer, Hoffman method). Periodic table of the elements and the periodic law.</td></tr>
</table>

6. Electronic structure of atoms - Bohr model of the atom, quantum numbers. Quantum theory of the electronic structure of atoms. Atomic orbitals.
7. Periodic Classification of elements and the periodic table. Periodic changes in physical properties. Atomic radius. Ionization energy. Electron affinity. Electronegativity.
8. Chemical bonding and molecular structure - Electronic valence theory, ionic and covalent compounds. Electronegativity and degree of oxidation. Writing Lewis structures and the octet rule. Formal charges. Exceptions from the octet rule. VSEPR model and geometry of the molecule.
9. Bond characteristics. Valence bond theory and theory of molecular orbitals.
10. Intermolecular forces. Dipole moment, Van der Waals and London forces, hydrogen bond.
11. The structure and properties of the liquid and solid. Physical properties of solutions. Types of solution. Expression of concentration.
12. The liquid in the liquid solution. Solutions of solids in liquids. Solutions of gases in liquids. Effect of temperature on the solubility. Effect of pressure on the solubility of gases. Colligative properties of solutions: nonelectrolyte and electrolyte solution.
13. Chemical reactions - types of chemical reactions, redox reactions, complex reactions (protolytic reactions and precipitation reactions and dissolution), complex reactions.
14. Chemical kinetics, reaction rate, reaction mechanism, the activation energy. Chemical equilibrium - term equilibrium, chemical equilibrium and chemical equilibrium constant. Factors that affect the chemical equilibrium.
15. Equilibrium in homogeneous and heterogeneous systems. Balance in the electrolyte solutions - equilibrium in solutions of acids and bases , the equilibrium of the complex in solution, the equilibrium between the solution and the insoluble crystals, redox balance

Seminars:

1. The oxidation number: definition, rules for determining in ions and molecules. Examples and training.
2. Nomenclature of Inorganic Chemistry. Names of monoatomic cations and monoatomic anions. Names of poliatomic cations and anion. The names of the ligands. Names of complex ions. Names of oxo acid and their salts.
3. Naming of inorganic compounds - training.
4. Balancing chemical equations, balancing redox equations.
5. Writing redox equations - practice.
6. The stoichiometry: Qualitative and quantitative relationships in chemical reactions. Molar method.
7. Stoichiometry: Quantitative relationships. Yield in chemical reactions and processes: the relevant reactant, the reactant in excess of the theoretical amount of reactants, the theoretical amount of product, yield and loss.
8. The stoichiometry: volume and mass in chemical reactions.
9. Electronic configuration of atoms and ions
10. Lewis structural formula
11. Electronic structural formula
12. Chemical equilibrium in homogeneous and heterogeneous systems
13. Chemical equilibrium in electrolyte solutions.

Exercises :

Exercise 1

The basic rules of laboratory work, safety precautions and protection in the lab, basic laboratory equipment. Washing, cleaning and drying of dishes. Basic laboratory operations, chemicals and dealing with them. Decomposition of the substance to the pure substance. Decomposition of heterogeneous and homogeneous mixture

Exercise 2

Decomposition of the mixture to the pure substance, Decomposition of

<table>
<tr><td></td><td colspan="6">heterogeneous substances, Sedimentation, decanting, centrifuging, filtering, Buchner funnel, distillation and fractional distillation, sublimation of iodine. Extraction of iodine from aqueous solutions
<u>Exercise 3</u>
Physical and chemical changes, the law of conservation of weight, Gay - Lussac's law of connected volumes. Exercise with models of unit cells. Determining the relative atomic mass of zinc. Determination of the empirical formula of copper chloride.
<u>Exercise 4</u>
Gas Laws: Determination of the molar volume of oxygen, Boyle's law, Charles Gay - Lussac's law, the pressure dependence of the temperature in gases.
<u>Exercise 5</u>
Solutions and their properties. Expressing of concentration. Preparation of the solution with given concentration. Solutions of liquids in liquids. Solutions of gases in liquids. Dependence of solubility on the nature (structure) of the substance. Dependence of solubility on temperature. Dissolution of liquids in liquids. Dissolving gases in liquids. Henry's law. Determination of molar mass by freezing point depression. Illustration of electrolytic dissociation. Illustration of ions traveling to the electrodes. Electrical conductivity of the solution. Redox - reactions of sulfur and oxygen. Redox reaction of dilute nitric acid solution and iron (II) sulfate. Decomposition and formation reactions of complexes. Ligand substitution reaction. Protolytic reactions (acid- base titration).
<u>Exercise 6</u>
Chemical kinetic, effect of concentration of reactants on the rate of chemical reactions. Effect of temperature on the rate of chemical reactions. The catalytic effect on the rate of chemical reactions. Balance in electrolyte solutions. Moving the chemical balance. Determination of the acid dissociation constant, K_a. Determination of pH: Approximately determination of pH using indicators. Determination of pH using pH sensors. Electrolysis - Determination of Faraday's constant. Electromotive force of galvanic cells - Daniell cell.</td></tr>
<tr><td>Format of instruction</td><td colspan="3">x lectures
x seminars and workshops
x exercises
☐ on line in entirety
☐ partial e-learning
☐ field work</td><td colspan="3">☐ independent assignments
☐ multimedia
x laboratory
☐ work with mentor
☐ (other)</td></tr>
<tr><td>Student responsibilities</td><td colspan="6">The 80% presence at lectures and seminars, and completed all laboratory exercises.</td></tr>
<tr><td rowspan="5">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)</td><td>Class attendance</td><td>3</td><td>Research</td><td></td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td>2</td><td>Report</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Tests</td><td>1</td><td>Oral exam</td><td>2</td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td>1</td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="6">Prior to joining the laboratory exercises, students' knowledge of the material concerned exercises will be verified by tests. All exercises must be completed. Students who obtain a signature from the course General Chemistry can take the exam. The exam consists of a written and oral examination. The student approached the oral exam must first pass a written examination. The written part of the exam lasts two hours. The written part of the exam is evaluated as follows :
Exactly solved more than 55 % - sufficient
Exactly solved more than 70 % - good
Exactly solved more than 80 % - very good
Exactly solved more than 90 % - excellent</td></tr>
</table>

<table>
<tr><td></td><td colspan="3">After the written exam on the notice board of the Department will be advertised results of the exam and time when students which did not pass the written exam can view tasks and schedule for oral examinations for students which have acquired this right.
A complete examination or part thereof may be installed through three partial tests during the semester. The tests cover material presented in lectures, seminars and exercises. Written tests are evaluated in the following manner:
Exactly solved more than 55 % - released a written exam
Exactly solved by 60 % - freed written and oral - sufficient
Exactly solved by 70 % - freed written and oral - good
Exactly solved by 80 % - freed written and oral - very good
Exactly solved by 90 % - freed written and oral - excellent
It is necessary to pass all tests in order to pass the exam. Students who did not meet any of the tests must take written and oral exam of that part.</td></tr>
<tr><td rowspan="6">Required literature (available in the library and via other media)</td><td>Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td>I Filipović, S. Lipanović, Opća i anorganska kemija I dio, Školska knjiga, Zagreb, 1995</td><td>10</td><td></td></tr>
<tr><td>S. Brinić: „Recenzirana predavanja iz odabranih poglavlja Opće kemije“ Veljača 2012. KTF-Split. 30.1.2014. <http://www.ktf-split.hr/~brinic/nastava/nast.html></td><td></td><td>web http://www.ktf-split.hr</td></tr>
<tr><td>Z. Grubač: „Recenzirana predavanja iz odabranih poglavlja Opće kemije“ Veljača 2012. KTF-Split. 30.1.2014. <http://www.ktf-split.hr/~grubac/opca.htm></td><td></td><td>web http://www.ktf-split.hr</td></tr>
<tr><td>M. Sikirica, Stehiometrija, Školska knjiga, Zagreb</td><td></td><td></td></tr>
<tr><td>Vježbe iz Opće kemije (interna skripta), Kemijsko-tehnološki fakultet, Split, 2013.</td><td></td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="3">D. D. Ebbing and S. D. Gammon, General Chemistry, 9th edition, Houghton Mifflin Company, Boston, 2009.

Raymond Chang, Chemistry, 10th edition, McGraw-Hill, New York, 2010.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="3">- Information from interviews, observations, and consultation with students during lectures
- Student survey</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="3"></td></tr>
</table>

General Biology

NAME OF THE COURSE	General Biology					
Code	KTJ 111	Year of study	1.			
Course teacher	PhD, Nada Bezić, Full professor	Credits (ECTS)	4.0			
Associate teachers	Valerija Dunkić, Associated professor	Type of instruction (number of hours)	L	S	E	F
			30	15		
Status of the course	Mandatory	Percentage of application of e-learning	0			

COURSE DESCRIPTION

Course objectives	Students learn to: • Introduce students to the relationships of animate and inanimate nature • Understand the basic principles of cell biology • mastering the basics of genetics and ecological relationships among organisms
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 will after the course unit power: • Recognize the importance of living organisms in relation to the environment • To master the basic knowledge of cell biology and evolution of organisms • Know the basic genetic principles • Know how environmental changes affect the ecosystem changes

Course content broken down in detail by weekly class schedule (syllabus)

Content - hours	L	S
Animate and inanimate nature.	3	1
Prokaryotes, eukaryotes, relationships between plants-animals	3	1
Membranes and transport through the membrane, nucleus, nucleolus	3	1
DNA, RNA, CD-biology, Endoplasmic reticulum, Golgi apparatus, lysosomes	3	1
Mitochondria - breathing, chloroplasts - photosynthesis, peroxisomes	3	1
Cell cycle, mitosis, meiosis (spermatogenesis, oogenesis), fertilization	3	1
The embryonic development model operon differentiation in plants and animals	3	1
Aging and death, viruses (HIV), tumors	3	1
The basics of inheritance, Mendel's laws, mutations	3	1
Ecological concepts and relationships of organisms in the biocenosis	3	1

Format of instruction		
	□**lectures** □**seminars and workshops** □exercises □*on line*in entirety □partial e-learning □field work	□independent assignments □multimedia □laboratory □work with mentor □ (other)

<table>
<tr><td>Studentresponsibilities</td><td colspan="6">Admission to the lectures of at least 70%, as well as seminars and seminar work in 100% of scheduled classes.</td></tr>
<tr><td rowspan="6">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)</td><td>Class attendance</td><td></td><td>Research</td><td></td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td></td><td>Report</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td>1</td><td>(Other)</td><td></td></tr>
<tr><td>Tests</td><td></td><td>Oral exam</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td>3</td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td colspan="6"></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="6">The obligation is to the students during the course of hearing preparation seminar that also must know the present. Upon completion of the lecture can be the time to take the entire test period courses in writing.</td></tr>
<tr><td>Required literature (available in the library and via other media)</td><td colspan="3">Title</td><td>Number of copies in the library</td><td colspan="2">Availability via other media</td></tr>
<tr><td colspan="3">Literatura the Webb Science</td><td></td><td colspan="2"></td></tr>
<tr><td colspan="3">G. M. Cooper, The Cell: A Molecular Approach, ASM Press. Washington , D.C. 2004.</td><td></td><td colspan="2"></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="6">A.Delić i N. Vijtiuk, Prirodoslovlje, Školska knjiga, Zagreb, 2004.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="6">Quality of the teaching and learning, monitored at the level of the
(1) teachers, accepting suggestions of students and colleagues, and
(2) faculty, conducting surveys of students on teaching quality.</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="6"></td></tr>
</table>

Computers Application

NAME OF THE COURSE	Computer application					
Code	KTK 104	Year of study	1			
Course teacher		Credits (ECTS)	4.0			
Associate teachers	PhD, Dražan Jozić, Associate Professor	Type of instruction (number of hours)	L	S	E	F
			15		30	
Status of the course	Mandatory	Percentage of application of e-learning				

COURSE DESCRIPTION			
Course objectives	Acquiring a basic knowledge of computers and computer systems. Knowledge about the use of Internet content and protect your computer from malicious programs. Basic skills about the content management (folders and files) on PCs using the Windows operating system. Basic skills using programs offered in the MS Office software.		
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 be able to: 1. Manage content on PC computer (files and folders) 2. Use the MS Word in the purpose of the editing the file according to the specified requirements (defining the shape and page layout, inserting the images, finished elements, tables, graphs ...) 3. Use the MS Excel for analysis, calculation, sorting, graphical presentation and format tables. 4. Use the MS PowerPoint to create presentations 5. Set up and use MS Outlook for editing and emailing 6. Find reliable sources of information on the Internet		
Course content broken down in detail by weekly class schedule (syllabus)	1. Week	L	General information about the course and mode of examination, Introduction to computers application, Information activity and technology, Computerization, Computer applications in Chemistry and Chemical Engineering
		E	
	2. Week	L	Hardware (PC), Von Neumann's model computers, Computer hardware, Computer types, Basic terms in theComputer Engineering and informatics, Basic parts (components) of the PC, Central processing unit (CPU), Computer memory, Motherboards and connectors, Input and Output devices
		E	
	3. Week	L	Operating systems and applications, The BIOS (Basic Input / Output System), Preparing disks and drives for installation of the OS, File system (FAT, NTFS), Computer Programs, System programs, Application programs, Operating systems
		E	
	4. Week	L	Basics commands for MS-DOS, GUI (Graphical User Interface), Properties GUI, History of developing the MS Windows OS, Example Installations operating systems (Windows OS), Customizing the User Interface, Library, Customize settings on PC computer, Firewall, Windows Defender, Windows Update, Action Center, Commercial

			antivirus programs
		E	
	5. Week	L	Backup and Restore, Control Panel, Customize the computer, The Device Manager, Accounts, Network and Sharing Center, Troubleshooting, Personalization, BitLocker Drive Encryption, Region and Language, Programs and Features, Installing and uninstalling programs, Display, Devices and Printers, Default Programs, Help and Support, Accessories and system tools, Shortcuts in Window OS, Changing the language of Windows OS
		E	
	6. Week	L	Malicious software (malware), Computer viruses, Computer worms, Trojan horses, Logic bombs, Spyware, Advertising Programs (Adware), INTERNET, History of the Internet, TCP / IP protocol
		E	
	7. Week	L	First test
		E	
	8. Week	L	Internet, Computer network and classification networks, Internet protocols: HTTP, HTTPS and FTP, Web browsers, Copyright Law
		E	
	9. Week	L	MS Office, MS Word, How to start the MS Word, Layout MS Word window, The status bar, Tabs and tools, Copy and paste data, Special characters, Styles, Tabs, Sections, Creating a new document, Copy text, Headers and footers, Page numbers
		E	MS Word: How to insert and edit the text and its formatting. Paragraph formatting. Lists of lists. Working with documents. formatting documents
	10.Week	L	How to insert and edit the formulas and equations, Application of the finished style characteristics, Input tables and formatting, input images in the document, the entry of bibliographic data entry page breaks and section breaks (define different sections of the document), display the contents of the document
		E	MS Word: Insert pictures, tables and SmartArt elements in the document. Formatting headers and footers document. Entering references and footnotes in the document. Insert the page break, Section break, Application of different style for document
	11.Week	L	MS Excel, How to start MS Excel, Layout MS Excel windows, Toolbar for quick access, Status bar, Tabs and tools, Tabs formulas, Editing data within a worksheet, Graphic data presentation, Input data string in the table, Add the trend data, Sorting data set
		E	MS Excel: Working with the tables. Entering data into tables and data formatting. Entering a series of data. Entering data from different files. Displaying data graphically.
	12.Week	L	Conditional Formatting Data, Creating and deleting equations, Addresses cells (relative, absolute, mixed), Types of functions, Logical operators, Boolean functions, Examples of application functions (IF, AND, OR, COUNTIF ..), MS PowerPoint, MS PowerPoint Startup, The appearance of windows, tabs and tools, Creating presentations, add themes, Themes Edit, Insert object (images, tables, links, media content ...)
		E	MS Excel: Data processing, Calculating with tables, Input and syntax

			for creating mathematical equations. Showing the trend curve.
	13.Week	L	MS Outlook, MS Outlook Startup, The appearance of windows, tabs and tools, Creating a user account , Creating a new e-mail
		E	MS Power Point: Creating presentations. Choosing the design, How to make redesign of an existing template.
	14.Week	L	Databases, What databases they are?, Fields in databases, How databases are developed?, Center for online databases, Bibliographic databases, Citation databases, Databases with full-text, Sciencedirect databases, Scopus databases, Web database, Bibliography
		E	
	15.Week	L	Second Test
		E	

Format of instruction	x lectures □seminars and workshops x exercises □*on line*in entirety □partial e-learning □field work	□independent assignments x multimedia □laboratory □work with mentor □ (other)
Studentresponsibilities	Class attendance in the amount of 70% to 100%, and to experimental work of 100% from 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	0.5	Research		Practical training	1.0
	Experimental work		Report		Independent work	0.6
	Essay		Seminar essay		Consultations	
	Tests	0.5	Oral exam		Practical part of exam	0.8
	Written exam	0.6	Project		(Other)	

Grading and evaluating student work in class and at the final exam	The written exam can be finished over the two tests during the semester. Minimum for successful tests is the limit of the 60% resolved test. Each test in assessing participates with a share of the 15% of the final grade. Presence at lectures 70-100% participates with a share of the 5% of the final grade while the presence of the laboratory exercises from 100% participates with a share of the 15% of the final grade. Practical part of exam participates with a share of the 50% of the final grade. The examination periods there is a written and oral exam. Minimum for successful written exam is the limit of the 60% resolved test. Passing one test (previous activity) is valuable in the summer semester examination period with a share of the 20% of the final grade. Written exam has a share of the 20% and practical part of exam has a share of the 40% of the final grade. Students who have not passed any tests during the semester they take the examination through written and practical exams in the regular examination period. Minimum for successful tests the limit of the 50% resolved test. Written part of exam participates with a share of the 30% of the final gradeand practical part of examwith a share of the 50% of the final grade. The final grade: 50%-61% - sufficient, 62%-74% - good, 75%-87% very good, 88%-100% - excellent.

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	1. D.Jozić, Predavanja iz kolegija:Primjena računala, Kemijsko-tehnološki fakultet, Interna skripta, Split, 2013.	1	

	2. WallaceWang, Office 2010 For Dummies, WileyPublishingInc., Indiana, 2010.	1	
Optional literature (at the time of submission of study programme proposal)	Selected articles from journals recommended by lecturer		
Quality assurance methods that ensure the acquisition of exit competences	Quality of the teaching and learning, monitored at the level of the (1) teachers, accepting suggestions of students and colleagues, and (2) faculty, conducting surveys of students on teaching quality.		
Other (as the proposer wishes to add)			

General Microbiology

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="6">General microbiology</td></tr>
<tr><td>Code</td><td>KTK 105</td><td>Year of study</td><td colspan="5">1</td></tr>
<tr><td>Course teacher</td><td>PhD, Skočibušić Mirjana
Associate Professor</td><td>Credits (ECTS)</td><td colspan="5">4.0</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Maravić Ana, PhD,
Senior Assistant</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>F</td></tr>
<tr><td>30</td><td>0</td><td>15</td><td>0</td></tr>
<tr><td>Status of the course</td><td>Mandatory</td><td>Percentage of application of e-learning</td><td colspan="5">0</td></tr>
<tr><td colspan="8">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="7">This course is designed to give students understanding of basic concepts in microbiology including various microorganisms their physiology, morphology, genetics, ecology, pathogenicity and application used of laboratory methods and techniques in microbiological research.</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="7">No</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="7">Students completing this course should be able to:
• better understanding of the evolutionary relationships between structure, diversity and replication of different groups of microorganisms.
• learn about genetic mechanisms of adaptation of prokaryotic microorganisms in a variety of environmental conditions.
• applied methods of physiological and biochemical tests for the identification of the different groups of microorganisms.
• identify the mechanisms of pathogenicity of microorganisms that cause diseases in humans and animals as well as the mechanisms used by the hosts to defend themselves against pathogens.
• determine the number of microorganisms in the sample and calculate the growth of microorganisms in controlled laboratory conditions.
•</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="7">1. Introduction. Historical development of microbiology. (2 hours)
2. The distribution of microorganisms and their role in biogeochemical processes in nature. (2 hours)
3. Eukaryotes, Archaea and Bacteria; structure and function. Morphology, nomenclature and classification of microorganisms. (2 hours)
4. Basic structure and function of prokaryotic and eukaryotic cells. (2 hours)
5. Microbial genetics, genome organization, mobile genetic elements. (2 hours)
6. The growth of microorganisms and the basic growth factors, nutrients, temperature, oxygen, pH and osmotic pressure. (2 hours)
7. Metabolic activity of microorganisms. Identification of microorganisms using various physiological and biochemical tests. (2 hours)
8. Microorganisms and diseases, resistance, relationship microorganisms and host immune responses to infection. (2 hours)
9. Mechanisms of antimicrobial resistance to antibiotics and other chemical substances. (2 hours)
10. Basic morphological characteristics of fungi, yeasts and molds and their pathogenicity. Diseases caused by fungi, and their toxins. (2 hours)
11. Application of microorganisms in biotechnology. (2 hours)
12. Basic morphological characteristics and development cycles of parasites.
13. The role of microorganisms in the biodegradation of heavy metals, nitrate, and chlorinated hydrocarbons. (2 hours)
14. Basic morphological characteristics of viruses, viroids and prions. Classification and nomenclature of viruses. Methods of studying properties of</td></tr>
</table>

<table>
<tr><td></td><td colspan="6">the viruses. (2 hours)
15. Control the growth of microorganisms by physical and chemical methods. (2 hours)
Lab topics will include: Techniques in aseptic conditions, methods of preparation and staining of various preparations. Isolation of pure cultures of microorganisms, preparation of culture media, culture and use of different methods of isolation and identification of bacteria. Basic macro and micromorphological characteristics and yeasts and molds. Cultivation of yeasts and molds on nutrient media, isolation and identification. The main morphological features of the parasite. Sampling and preparation of samples for identification of parasites. Mechanisms of antimicrobial resistance of bacteria to antibiotics and other chemical substances and to determine the sensitivity of microorganisms to antibiotics. Methods for determining the number of bacteria in different samples of food and water dilution method, the spectrophotometric method and membrane filtration.</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒lectures
☒seminars and workshops
☒exercises
□ on linein entirety
□ partial e-learning
□ field work</td><td colspan="3">☒ independent assignments
☒multimedia
☒laboratory
□ work with mentor
□(other)</td></tr>
<tr><td>Student responsibilities</td><td colspan="6">Admission to the lectures in the amount of at least 70% of the times scheduled. Completed all planned laboratory exercises and seminar essay.</td></tr>
<tr><td rowspan="6">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)</td><td>Class attendance</td><td>1,0</td><td>Research</td><td></td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td>0,5</td><td>Report</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td>0,5</td><td>(Other)</td><td></td></tr>
<tr><td>Tests</td><td></td><td>Oral exam</td><td>1,0</td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td>1,0</td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="6">The final grade of the student is compiled from the combination of lecture, seminar, laboratory. Final course grade will be based on: Mid-term exam 30%; End of term exam 35%; Seminar 10%; Lab course 15%. Course grade will be based upon a percentage of total points obtained using the following scale: <60% insufficient; 60-70% sufficient (2); 70-80% good (3); 80-90% very good (4); 90-100% excellent (5).</td></tr>
<tr><td rowspan="4">Required literature (available in the library and via other media)</td><td colspan="3">Title</td><td>Number of copies in the library</td><td colspan="2">Availability via other media</td></tr>
<tr><td colspan="3">S. Duraković, S.Redžepović, Uvod u opću mikrobiologiju, Kugler, Zagreb, 2002.</td><td>5</td><td colspan="2"></td></tr>
<tr><td colspan="3">S. Kalenić, E. Mlinarić-Missoni i sur., Medicinska bakteriologija i mikologija, Merkur A.B.D., Zagreb, 2005.</td><td>5</td><td colspan="2"></td></tr>
<tr><td colspan="3">Z. Brudnjak, Medicinska virologija, Merkur A.B.D., Zagreb, 2002</td><td>5</td><td colspan="2"></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="6">R.A. Harvey, P.C. Champe, B.D. Fisher, Microbiology, 2th ed., Lippincott, Williams and Wilkins, Philadelphia, 2007.
R.M. Patrick, S.R. Ken, A.P. Michael, Medical Microbiology, 5th ed. Elsevier/Mosby, Philadelphia, 2005.</td></tr>
<tr><td>Quality assurance</td><td colspan="6">Quality assurance will be performed at different levels: Keeping records of his</td></tr>
</table>

methods that ensure the acquisition of exit competences	attendance; Annual performance analysis examination; Student surveys in order to evaluate teachers; Self-evaluation of teachers; Feedback from students who have already graduated from the relevance of content items.
Other (as the proposer wishes to add)	

Inorganic Chemistry

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">Inorganic chemistry</td></tr>
<tr><td>Code</td><td>KTK 106</td><td>Year of study</td><td colspan="4">1.</td></tr>
<tr><td>Course teacher</td><td>dr. sc. Zoran Grubač, full professor
dr. sc. Slobodan Brinić, associate professor</td><td>Credits (ECTS)</td><td colspan="4">7</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2"></td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>F</td></tr>
<tr><td>30</td><td>15</td><td>30</td><td></td></tr>
<tr><td>Status of the course</td><td></td><td>Percentage of application of e-learning</td><td colspan="4"></td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">Introduce students to the chemical reactivity of elements along the periodic table, and with the properties and composition of common chemicals. To develop students ability to notice similarities and differences between inorganic compounds and inorganic substances. Understanding of the changes in the various physical and chemical conditions</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">-</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">Students upon completion of the course:
1) will know the basic characteristics and producing of chemical elements for the major groups of periodic table of elements (PTE)
3) be able to identify the type and properties of chemical compounds of main group
3) be able to identify the type and properties of transition metal compounds
4) to classified compounds on the base of their characteristics
5) to predict acidic, basic and amphoteric properties of salts
6) to know common salt crystal structure
7) to predict the possible reaction mechanisms and outcomes of chemical reactions
8) to independently and safely perform simple chemical reactions</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="6">Lectures:
1. Hydrogen position in PTE, hydrogen properties and production, positive oxidation state and hydrides
2. Noble gases, properties of group, obtaining and using of xenon compounds
3. Introduction to halogens, elements properties in order to oxidation state
4. Fluorine production and properties, differences between the fluorine and the other members of the group, fluorine compounds. Chlorine producing and properties, compounds of chlorine, bromine and Iodine
5. Introduction to chalcogen elements, elements properties in order to oxidation state
6. Oxygen properties and production, the compounds of oxygen, oxides, water
7. Sulfur properties and production, oxides and sulfur acids, other sulfur compounds, compounds of selenium and tellurium,
8. A group of nitrogen, elements properties in order to oxidation state
9. Nitrogen, properties of the production, ammonia, nitric acid and other nitrogen compounds, nitrogen fixation
10. Phosphorus, properties and production, oxides and acids of phosphorus, arsenic, antimony and bismuth
11. A group of carbon, elements properties in order to oxidation state
12. Carbon allotropes, carbon properties and production, carbon oxides, carbides,</td></tr>
</table>

<table>
<tr><td></td><td colspan="6">carbonates and bicarbonates. The compounds of silicon, germanium, tin and lead, semiconductor properties of silicon and germanium
13. A group of boron, elements properties in order to oxidation state, boranes, boric acid
14. Production and properties of aluminum, aluminum compounds, gallium, indium, thallium
15. Alkali and alkaline earth metals

<u>Seminars</u> :
1. Balancing chemical reactions, writing and balancing redox reactions in one line
2. Common reactions of hydrogen, the reducing action of hydrogen
3. Common reactions of chlorine, the disproportionation of chlorine in alkaline solutions, the oxidation activity of the halogens compounds
4. Common reactions of chalcogen elements, reaction of oxygen and ozone, the oxidizing action of oxygen,
5. The reaction of sulfur, the reactions which translate elemental sulfur to sulfuric acid, the oxidizing action of sulfuric acid, a dehydrating effect of sulfuric acid
6. Common reactions of nitrogen, the nitrogen production reactions, the reaction of ammonia oxidation to nitric acid, the oxidizing action of nitric acid.
7. Common reactions of phosphorus, oxidation reactions of phosphorus to phosphorus and phosphoric acid
8. Common reactions of carbon, oxides of carbon production, reducing effect of CO, binding of CO_2 from the air, the precipitation of carbonates, cation hydrolysis
9. Common reactions of the boron group elements, reaction of boric acid production, dissolution of borax in water, production of crystalline boron acid, base properties of aluminum hydroxide,
10. Aluminum reducing action, aluminotermic reaction, common reactions of metals and metal production,
11. Common reactions of alkali and alkaline earth metals with water and their salts
12. Common reactions of transition metals, proving of peroxide with titanyl ion, oxidation states of vanadium, oxidative properties of permanganate, equilibrium between chromate and dichromate, iron compounds
13. Noble metals, zinc, cadmium and mercury
14. Sea - a mixture of inorganic substances. The chemical composition of sea water, salinity, pH and speciation
15. Mixed problems

<u>Exercises :</u>
1. Exercise: HYDROGEN
2. Exercise: 17th GROUP (Halogens)
3. Exercise: 16th GROUP (Chalcogens)
4. Exercise: 15th GROUP
5. Exercise: 14th GROUP and 13th GROUP, 1st and 2nd groups (Alkali and earth alkali metals)
6. Exercise: TRANSITION ELEMENTS (groups 3 to 7)
7. Exercise: TRANSITION ELEMENTS (groups 8 to 12)</td></tr>
<tr><td>Format of instruction</td><td colspan="3">x lectures
x seminars and workshops
x exercises
☐on line in entirety
☐partial e-learning
☐field work</td><td colspan="3">☐independent assignments
☐multimedia
x laboratory
☐work with mentor
☐ (other)</td></tr>
<tr><td>Student responsibilities</td><td colspan="6">The 80% presence at lectures and seminars and completed all laboratory exercises.</td></tr>
<tr><td>Screening student work (name the</td><td>Class attendance</td><td>2</td><td>Research</td><td></td><td>Practical training</td><td></td></tr>
</table>

proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Experimental work	2	Report		(Other)	
	Essay		Seminar essay		(Other)	
	Tests	1	Oral exam	1	(Other)	
	Written exam	1	Project		(Other)	

Grading and evaluating student work in class and at the final exam	Prior to joining the laboratory exercises, students' knowledge of the material concerned exercises will be verified by tests. All exercises must be completed. Students who obtain a signature from the course Inorganic Chemistry can take the exam. The exam consists of a written and oral examination. The student approached the oral exam must first pass a written examination. The written part of the exam lasts two hours. The written part of the exam is evaluated as follows: Exactly solved more than 55 % - sufficient Exactly solved more than 70 % - good Exactly solved more than 80 % - very good Exactly solved more than 90 % - excellent After the written exam on the notice board of the Department will be advertised results of the exam and time when students which did not pass the written exam can view tasks and schedule for oral examinations for students which have acquired this right . A complete examination or part thereof may be installed through three partial tests during the semester. The tests cover material presented in lectures, seminars and exercises. Written tests are evaluated in the following manner: Exactly solved more than 55 % - released a written exam Exactly solved by 60 % - freed written and oral - sufficient Exactly solved by 70 % - freed written and oral - good Exactly solved by 80 % - freed written and oral - very good Exactly solved by 90 % - freed written and oral - excellent It is necessary to pass all tests in order to pass the exam. Students who did not meet any of the tests must take written and oral exam of that part .

	Title	**Number of copies in the library**	**Availability via other media**
Required literature (available in the library and via other media)	I. Filipović, S. Lipanović, Opća i anorganska kemija II dio, Školska knjiga, Zagreb, 1995	10	
	S. Brinić, „Recenzirana predavanja iz odabranih poglavlja Anorganske kemije“ veljača 2012. KTF-Split. 30.1.2014. <http://www.ktf-split.hr/~brinic/nastava/nast.html>		web http://www.ktf-split.hr/
	Z.Grubač: „Recenzirana predavanja iz odabranih poglavlja Anorganske kemije“ veljača 2012. KTF-Split. 30.1.2014. <http://www.ktf-split.hr/~grubac/opca.htm>		web http://www.ktf-split.hr/
	Vježbe iz Anorganske kemije (interna skripta), Kemijsko-tehnološki fakultet, Split, 2013.		web http://www.ktf-split.hr/

Optional literature (at the time of submission of study programme proposal)	F. Albert Cotton et al., Basic Inorganic Chemistry, New York, John Wiley and Sons, 1995.
Quality assurance	- Information from interviews, observations, and consultation with students during

methods that ensure the acquisition of exit competences	lectures - Student survey
Other (as the proposer wishes to add)	

Analytical Chemistry

NAME OF THE COURSE	ANALITICAL CHEMISTRY					
Code	KTK 107	Year of study	1			
Course teacher	Ph.D. Josipa Giljanović, associated professor	Credits (ECTS)				
Associate teachers	Ante Prkić	Type of instruction (number of hours)	L	S	E	F
			90	15	45	0
Status of the course	Obligatory	Percentage of application of e-learning				
COURSE DESCRIPTION						
Course objectives	Acquiring basic basic theoretical knowledge of analytical chemistry, the role and application of analytical chemistry in various fields					
Course enrolment requirements and entry competences required for the course	Completing the course: General Chemistry					
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	After completing the course, the student will will be able to - Define the concept of analytical chemistry - Differentiate between the concepts of qualitative and quantitative chemical analysis - Understand the concept of quantitative chemical reactions - Understand the concept of gravimetric and volumetric determination - Understand the precipitation, neutralization, complexometric and redox titrations - Solving numerical problems from a qualitative and quantitative chemical analysis					
Course content broken down in detail by weekly class schedule (syllabus)	First week : Description and review of curriculum. Definitions of analytical chemistry. Division of Analytical Chemistry. The concept of the analytical signal. Seminar: Solving numerical problems from theoretical lecture Second week : The concept and definition of chemical analysis - qualitative and quantitative. Seminar: Solving numerical problems; homogeneous and heterogeneous equilibrium in analytical chemistry. 3rd week : Qualitative chemical analysis. The concept and definition of acids and bases. Consideration of acid-base balance. Seminar: Solving problems 4th week : The concept and definition of complex ions., complexometric equilibrium .Seminar: Solving problems 5th week : The concept and definition of electrochemical reactions. Consideration of electrochemical equilibrium. Seminar: Solving problems 6th week: The concept and definition of heterogeneous equilibrium. process of dissolution and precipitation. Seminar: Solving problemsI 7th week .Recapitulation of theoretical and seminars lecture I partial exam .theoretical lecture and seminars 8th week . Quantitative chemical analysis. The concept and definition of gravimetric determination. Seminar: Solving problems, 9th week . optimization of precipitationcondition. Seminar: Solving problems. 10th week : The concept and definition of standards and standard solutions - primary and secondary. The concept and definition of the volumetric					

<table>
<tr><td></td><td colspan="6">determination; Seminar: Solving problems.
11th week : The concept and definition of volumetric determinations- Argentometric titration; Seminar: Solving problems.
12 weeks The concept and definition of volumetric determinations based on neutralization reactions - acid-base titration; Seminar Solving problems
13th week . The concept and definition of volumetric determinations based on the complex - complexometric titrations; Seminar Solving problems
14th week . The concept and definition of volumetric determinations based on redox reactions. Seminar Seminar Solving problems
15th week : Recapitulation of theoretical and seminars lecture II partial exam .theoretical lecture and seminars.</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒ lectures
☒ seminars and workshops
☒ exercises
☐on linein entirety
☐partial e-learning
☐field work</td><td colspan="3">☐independent assignments
☒ multimedia
☒ laboratory
☐work with mentor
☐ (other)</td></tr>
<tr><td>Studentresponsibilities</td><td colspan="6">Lectures attendance - at least 80% and completing exercises</td></tr>
<tr><td rowspan="6">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)</td><td>Class attendance</td><td>1</td><td>Research</td><td></td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td>3</td><td>Report</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Tests</td><td>1</td><td>Oral exam</td><td>2</td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td>2</td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td></td><td colspan="5"></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="6">The entire test can be applied over two partial tests during the semester. Passing threshold is 60%. Each test in assessing participates with 50%. Lectures presence of 80 to 100% is 10% marks. The examination periods there is a written and oral exam. Passing threshold is 60%. Passing one partial test of any part (previous activity) is valid throughout current academic year. Written exam has a share of 50% and oral examination also 50%. Students who have not passed the partial tests will have oral examination in the regular examination period. Passing threshold is 60% and the examination form to participate in the evaluation by 50%.

Rating: 60% -69% - satisfactory, 70% -79% - good, 80% -89% very good, 90% - 100% - excellent.</td></tr>
<tr><td rowspan="5">Required literature (available in the library and via other media)</td><td colspan="3">Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td colspan="3">1. D. A.Skoog, D. M. West, F. J. Holler, Fundamentals of Analytical Chemistry, Seventh Edition, Saunders College Publishing, New York, London, 1996. { šesto izdanje (englesko) 1992, prvo izdanje (hrvatsko), Školska knjiga, Zagreb, 1999.};
2.A. Skoog, D. M. West i F. J. Holler, S. R. Crouch, Fundamentals of Analytical Chemistry, 9th edition,</td><td>1. 6

1</td><td>Web page of the Department of Analytical Chemistry</td></tr>
<tr><td colspan="3"></td><td></td><td></td></tr>
<tr><td colspan="3"></td><td></td><td></td></tr>
</table>

	Brooks&Cole, SAD, 2014.; 3. Nj. Radić, L. Kukoč-Modun, Uvod u analitičku kemiju, Redak, 2013.; 4.D.C.Harris, Quantitative Chemical Analysis, Eighth Edition, W.H.Freeman and Company, New York, 2010.		
Optional literature (at the time of submission of study programme proposal)	Z. Šoljić, Računanje u analitičkoj kemiji, Zagreb, 1998.		
Quality assurance methods that ensure the acquisition of exit competences	• registration of student's presence in class • annual analysis of students success in this course • student's survey in order to evaluate the professor • professor's self-evaluation		
Other (as the proposer wishes to add)			

Food and Nutrition

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="6">Food and Nutrition</td></tr>
<tr><td>Code</td><td>KTK 108</td><td>Year of study</td><td colspan="4">I</td></tr>
<tr><td>Course teacher</td><td>Ph.D. Visnja Katalinic, Full Professor
Ph.D. Tea Bilusic, Full Professor</td><td>Credits (ECTS)</td><td colspan="4">4.0</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2"></td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>F</td></tr>
<tr><td>30</td><td>15</td><td>0</td><td>0</td></tr>
<tr><td>Status of the course</td><td>Mandatory</td><td>Percentage of application of e-learning</td><td colspan="4"></td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">Acquiring a basic knowledge on
- the role of food in human health (the role of macro- and micronutrijets from food)
- on energy and nutritive value of food
- on unnaceptable food components
- digestion processes and absorption rate of macronutrients
- determination of energy and nutritive value of food</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6"></td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">After completing the course, the student will become familiarized with the major concepts of food science, which includes:

• identifying and naming of macro- and micronutrients in food
• learn about the daily energety intake
• learn to calculate the body mass index
• lean on healthy diet regime</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="6">1. Introduction. Role of food (2 hours)
2. Food components: Macronutrients (sugars, lipids, proteins). (6 hours)
3.Micronutrients (water soluble vitamins, liposoluble vitamins, minerals). (4 hours)
4.Macronutrients digestion. (2 hours)
5.Daily energy requierements. (2 hours)
6.Non-nutritive food components – phytochemicals. (2 hours)
7.Healty diet principles. (2 hours)
8.Planning the diet. (2 hours)
9.The role of nutrition in human evolution process. (2 hours)
10.Vegetarian i macrobiotic diet. (2 hours)
11.Mediterranean diet. (2 hours)
12.Food alergenes. (2 hours)</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒ lectures
☒ seminars and workshops
□exercises
□on linein entirety
□partial e-learning
□field work</td><td colspan="3">□independent assignments
☒ multimedia
□laboratory
□work with mentor
□ (other)</td></tr>
<tr><td>Studentresponsibiliti</td><td colspan="6">Lectures attendance - at least 70% of full schedule; attendance on seminar work –</td></tr>
</table>

<table>
<tr><td>es</td><td colspan="6">at least 80% of full schedule. To design the seminar work on selected topic</td></tr>
<tr><td rowspan="6">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)</td><td>Class attendance</td><td>1</td><td>Research</td><td></td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td></td><td>Report</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td>0.5</td><td>(Other)</td><td></td></tr>
<tr><td>Tests</td><td>0.5</td><td>Oral exam</td><td>2</td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td></td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td colspan="6"></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="6">During semester, two written exams are provided (as partical 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.</td></tr>
<tr><td rowspan="5">Required literature (available in the library and via other media)</td><td colspan="3">Title</td><td>Number of copies in the library</td><td colspan="2">Availability via other media</td></tr>
<tr><td colspan="3">V. Katalinić: Temeljno znanje o prehrani, sveučilišni priručnik, 2011. g.</td><td></td><td colspan="2">KTF web page</td></tr>
<tr><td colspan="3">T. Bilušić: Osnove znanosti o hrani, autorizirana predavanja, KTF, 2013.g.</td><td></td><td colspan="2">KTF web page</td></tr>
<tr><td colspan="3">T. Bilušić: Dijetetika, autorizirana predavanja, KTF, 2013.g.</td><td></td><td colspan="2">KTF web page</td></tr>
<tr><td colspan="3">G. Krešić. Trendovi u prehrani, Fakultet za menadžment u ugostiteljstvu i turizmu, Opatija, 2012.</td><td>1</td><td colspan="2"></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="6">R. Živković: Dijetetika, Medicinska naklada, Zagreb, 2002.
J. S. Garrow, W.P.T. James: Human nutrition and dietetics. 10th Edition, Churchill Livingostone, Co. London, 2000.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="6">• registration of student's presence in class
• annual analysis of students success in this course
• student's survey in order to evaluate the professor
• professor's self-evaluation</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="6"></td></tr>
</table>

Physical Chemistry

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">Physical Chemistry</td></tr>
<tr><td>Code</td><td>KTK 109</td><td>Year of study</td><td colspan="4">2nd year</td></tr>
<tr><td>Course teacher</td><td>PhD, Renato Tomaš, Assistant Professor</td><td>Credits (ECTS)</td><td colspan="4">7.0</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2"></td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>F</td></tr>
<tr><td>30</td><td>15</td><td>30</td><td></td></tr>
<tr><td>Status of the course</td><td>Mandatory</td><td>Percentage of application of e-learning</td><td colspan="4"></td></tr>
<tr><td colspan="6">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="5">The aims of the course are to enable students to:
- understand basic concepts, laws and principles of thermodynamic and kinetic approaches to physical and chemical changes,
- resolve different physicochemical problems,
- perform measurements in the laboratory individually or in a team, present and process measurement data,
- apply acquired knowledge and skills in professional and specialist courses.</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="5">Course enrollment prerequisite is General Chemistry.
Required competences are knowledge of Mathematics (Calculus) and fundamentals of Physics and Chemistry.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="5">Upon successful completion of the program, students will be able to:
1. Describe basic concepts, laws and principles of thermodynamic and kinetic approaches to physical and chemical changes.
2. Explain different physicochemical dependencies of the examined systems.
3. Calculate physicochemical parameters using thermodynamic and kinetic equations.
4. Perform experiments and measurements in the laboratory.
5. Interpret experimental and numerical data.</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="5">Lectures (2 hours weekly):
1st week: Introduction: Physical chemistry - course contents. Basic terms. System and surroundings. Intensive and extensive thermodynamic variables. Progress of the reaction. Zeroth low of thermodynamics.
1st and 2nd week: Properties of gases: The perfect gas equation of state. The ideal gas temperature scale. Ideal gas mixtures and Dalton's law. The kinetic model of gases. Real gases. The van der Waals equation of state.
2nd, 3rd and 4th week: First law of thermodynamics: Work and heat. Internal energy. Enthalpy. Heat capacities. Joule-Thomson expansion. Adiabatic processes with gases. Thermochemistry. Enthalpy of formation. Calorimetry.
4th, 5th and 6th week: Second and third laws of thermodynamics: Direction of spontaneous change. Entropy as a state function and the second law. Entropy changes in system and surroundings. Entropy changes in irreversible processes. Entropy change accompanying a phase transition. Entropy of mixing ideal gases. Calorimetric determination of entropies and the third law. Gibbs energy. Properties of the Gibbs energy.
6th and 7th week: Phase equlibria-pure substances: Condition of stability. Variation of Gibbs energy with pressure. Variation of Gibbs energy with temperature. Phase diagrams, phase boundaries and location of phase boundaries. The phase rule. Significance of the chemical potential. Fugacity.
8th i 9th week: Properties of mixtures: Partial molar properties. Gibbs-Duhem</td></tr>
</table>

<table>
<tr><td></td><td colspan="6">equation. The chemical potentials of liquids. Spontaneous mixing. Ideal solutions. Ideal-dilute solutions. Real solutions: activities. Colligative properties. Phase diagrams of mixtures.
10th and 11th week: Principles of chemical equilibrium: Homogeneous and heterogeneous reactions. The reaction Gibbs energy. Reactions at equilibrium. Equilibrium constants and determination of equilibrium constants. Standard reaction Gibbs energy. Effect of temperature on the equilibrium constant. Effect of pressure, initial composition, and inert gases on the equilibrium composition.
11th and 12th week: Ionic equilibria: Activity of electrolytes. Debye-Hückel theory. Proton transfer equilibria. Salts in water. Solubility equilibria.
12th and 13th week: Electrochemistry: Ions in solution and migration of ions. Conductivity of electrolyte solutions. Viscosity. Strong and weak electrolytes. The drift speed. Ion mobilities. Mobility and conductivity. Measurement of transport numbers. Electrochemical cells. Varietes of cell. The cell reaction and electromotive force. Cells at equilibrium. Standard potentials. Determination of pH. Membrane potential.
13th i 14th week: Chemical kinetics: Empirical chemical kinetics. Reaction rates. Rate laws and rate constants. Reaction order. Half-lives and time constants. The temperature dependence of reaction rates. The relation between rate constants and equilibrium constants. Parallel and consecutive reactions.
15th week: Properties of surfaces: Properties of liquid surfaces. Colloidal systems. Adsorption on solid surfaces. Adsorption isotherms. Catalytic activity at surfaces.
Seminars (one hour weekly):
Solving numerical problems in physical chemistry.
Exercises (five hours weekly):
By working out 6 exercises student evidences in practice some of the principles presented through lectures and seminars: Coligative properties. Viscosity. Chemical equilibrium. Phase diagrams of ternary system. Conductivity and conductometric titration. Kinetics of inversion saccharose by polarimetric method.</td></tr>
<tr><td>Format of instruction</td><td colspan="3">□lectures
□seminars
□exercises
□on linein entirety
□partial e-learning
□field work</td><td colspan="3">□independent assignments
□multimedia
□laboratory
□work with mentor
□ (other)</td></tr>
<tr><td>Studentresponsibilities</td><td colspan="6">Lecture and seminar attendance and active participation of at least 70 percent of the planned schedule.
Complete all laboratory exercises.
The exam can be taken continuously (cumulatively) through colloquiums (partial tests) combining theoretical and practical tasks or as one comprehensive exam (written and oral).</td></tr>
<tr><td rowspan="6">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)</td><td>Class attendance</td><td>1.5</td><td>Consultations</td><td>0.2</td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td>1.5</td><td>Report</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Tests</td><td>2</td><td>Oral exam</td><td>1</td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td>0.8</td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Grading and evaluating student</td><td colspan="6">Continually evaluation: (success (%) / share in evaluating (%):</td></tr>
</table>

<table>
<tr><td>work in class and at the final exam</td><td colspan="3">• presence and activities in the classroom: (70 - 100 / 10)
• laboratory exercises: (100 / 15)
• first partial test: (60 - 100 / 25)
• second partial test: (60 - 100 / 25)
• third partial test: (60 - 100 / 25)
Final evaluation: (success (%) / share in evaluating (%):
• written exam with numerical tasks: (50 - 100 / 40)
• oral exam: (50 - 100 / 45)
• priviously activities from continually evaluation: (50 - 100 / 15)</td></tr>
<tr><td rowspan="6">Required literature (available in the library and via other media)</td><td>Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td>P. Atkins, J. de Paula, Elements of Physical Chemistry, 4th Edition, Oxford University Press, Oxford, 2005.</td><td>2</td><td></td></tr>
<tr><td>R. J. Silbey, R. A. Alberty, M. G. Bawendi, Physical Chemistry, 4th Edition, John Wiley and Sons, New Jersey, 2005.</td><td>1</td><td></td></tr>
<tr><td>R. Tomaš, Own lectures from physical chemistry, powerpoint presentation, 2009.</td><td></td><td>digital source</td></tr>
<tr><td>J. Radošević, Lj. Aljinović, Fizikalna kemija, Laboratorijske vježbe, Sveučilišna naklada Liber, Split, 1980.</td><td>25</td><td></td></tr>
<tr><td>I. Tominić, Fizikalna kemija II, Kemijsko-tehnološki fakultet, Split, 2010.</td><td></td><td>www.ktf-split.hr</td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="3">I. Mekjavić, Fizikalna kemija 1, Školska knjiga Zagreb, 1996.
I. Mekjavić, Fizikalna kemija 2, Golden marketing, Zagreb, 1999.
A. M. Halpern, Experimental Physical Chemistry, A Laboratory Textbook, 2nd Edition, Prentice Hall, New Jersey, 1997.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="3">- monitoring suggestions and reactions of participants during the semester
- student survey</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="3"></td></tr>
</table>

Organic Chemistry

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">Organic chemistry</td></tr>
<tr><td>Code</td><td>KTK 201</td><td>Year of study</td><td colspan="4">2</td></tr>
<tr><td>Course teacher</td><td>Dr. Ivica Blažević, Assistant Professor</td><td>Credits (ECTS)</td><td colspan="4">10.0</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2"></td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>F</td></tr>
<tr><td>60</td><td>15</td><td>45</td><td>0</td></tr>
<tr><td>Status of the course</td><td>Mandatory</td><td>Percentage of application of e-learning</td><td colspan="4"></td></tr>
<tr><td colspan="6">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="5">Acquiring a basic knowledge of basic organic chemistry that involves understanding the structure and properties of organic compounds and mechanisms of organic reactions, mastering practical laboratory techniques used in the synthesis, isolation, purification and identification of organic compounds present in living systems and food.</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="5"></td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="5">After completing the course, the student will become familiarized with the major concepts of organic chemistry, which includes:
• identifying and naming of organic compounds according to functional groups and compare their physico - chemical properties;
• learn about the organic compounds isomerism, stereochemical designations, features, and separation;
• learn about organic compounds structure determination by spectroscopy (MS, NMR, IR, and UV/Vis);
• analyze the reactivity of organic compounds with respect to their structure and stereochemistry;
• propose appropriate reaction mechanisms of organic molecules that include addition, substitution and elimination;
• identify and interpret division, structure and properties of natural organic compounds (carbohydrates, nucleic acids and lipids).
• After performing laboratory practice student will be able to use laboratory techniques (such as extraction, distillation, reflux, chromatography, recrystallization, infrared spectroscopy, etc.), for (i) purification, (ii) isolation, (iii) synthesis, and (iv) identification of the organic compounds.</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="5">➢ LECTURES AND SEMINARS:

1. Introduction: What is organic chemistry? History of organic chemistry and its modern role. The main concepts of organic chemistry (functional groups, stereochemistry, curly arrows) (2 hours)

2. The nature of chemical bonds: Electronegativity. Bonds polarity, dipol, and formal charge. Lewis structure. Atomic orbitals. Molecular orbitals. Hybridization (sp^3, sp^2, sp). Length and energy of the bonds. The molecular geometry. The modified hybrid orbitals. VSEPR theory. (4 hours)

3. Physical properties and intermolecular connections: Van der Waals forces. Dipole - dipole. "Hydrogen bond". Solubility in solvents. (2+1 hours)

4. Nomenclature and classes of organic compounds. Hydrocarbons (alkanes, cycloalkanes). Functional groups and acronyms. The nomenclature of</td></tr>
</table>

	hydrocarbons (alkenes, alkynes). Nomenclature organohalogenated compounds, alcohols, amines. Nomenclature of aldehydes and ketones, carboxylic acids, acid derivatives. Systematic (IUPAC) nomenclature. Examples. (*7+2 hours*) 5. **Structure of molecules and isomerism. Constitutional isomers.** Alkanes. **Isomers.** Shapes of molecules and IHD. Stereochemistry. Conformations of alkanes (ethane, butane) and rings (C3, C4, C5, cyclohexane). Mono-substituted cycloalkanes. (*3+1 hours*) **I. PARTIAL EXAM** (*written*, *1hour and 10 min*) 6. Configuration of the cis / trans and E / Z; CIP rule. Conformations of disubstituted cycloalkanes. Alkenes. **Chirality and the plane of symmetry. Molecules with one stereocenter.** Enantiomers and racemic mixtures. The properties of the enantiomers. Optical activity. Polarimeter. Determination of tetrahedral stereogenic center. Fischer projections. Relative configuration. **Molecules with two stereocenter.** The properties of enantiomers, diastereomers and meso compounds. The separation of the racemate. **Chiral molecules without stereocenter.** (*9+2 hours*) 7. **Determining organic structures.** Introduction. Mass spectrometry (MS). Resolution. Molecular ion. Isotopes. Fragmentation. Examples of mass spectra. Electromagnetic radiation. Ultraviolet and visible spectroscopy (UV/Vis). Infrared spectroscopy (IR). Nuclear magnetic resonance (NMR). ^{13}C NMR. ^{1}H NMR. Chemical shift. Spin-spin coupling. Examples of IR, and NMR spectra. (*6+3 hours*) 8. **Organic reactions**. Definitions of basic terms. The division of reactions to the change of structure and to the reaction type. Acidity, basicity, and pK_a. Factors that enhance the acidity (the size of atoms, electronegativity, resonance, hybridization, inductive effects, charge, solvation, steric effects). Acid - base reactions. The rules for determining the oxidation state of carbon. Oxidation - reduction reactions. Usage of the curly arrows in the reaction mechanism. Intermediates. Nucleophiles and electrophiles. (*4 hours*) **II. PARTIAL EXAM** (*written*, *1hour and 10 min*) 9. **Alkanes and cycloalkanes.** Oxidation. Halogenation. **Alkyl halides**. Nucleophilic substitution at the saturated carbon (SN1 and SN2 mechanism). Elimination reactions (E1, E2 mechanisms). **Alkenes and alkynes.** Electrophilic additions and free radical, polymerization. **Conjugated unsaturated compounds**. 1,2 - and 1,4 - addition. **Aromatic compounds.** Electrophilic and nucleophilic aromatic substitution. **Phenols**. **Alcohols and ethers. Organometallic compounds. Aldehydes and ketones.** Nucleophilic addition to the carbonyl group. **Carboxylic acids and derivatives.** Nucleophilic substitution at the carbonyl group. **Amines. Heterocyclic compounds**. (*18+5 hours*) 10. **Carbohydrates. Amino acids. Nucleic acid. Lipids**. (*5+1 hours*) **III. PARTIAL EXAM** (*written*, *1hour and 10 min*) **IV. PARTIAL EXAM** (*oral*, *30 min*) ➢ **LABORATORY EXERCISES:** Laboratory safety and rules. Isolation and purification of organic compounds. Crystallization and melting point determination. Distillation. Extraction. Organic compounds synthesis. Diazotation. Carbonyl compounds-nucleophilic addition. Carboxylic acid derivatives-nucleophilic substitution. Electrophilic aromatic substitution. Oxidation-reduction reactions. Chromatography. Thin-layer chromatography. Column chromatography. Organic compounds characterization. Characteristic reactions of functional groups. Methods of

<table>
<tr><td></td><td colspan="6">spectroscopic analysis.</td></tr>
<tr><td>Format of instruction</td><td colspan="3">X lectures
□ seminars and workshops
X exercises
□ on linein entirety
□ partial e-learning
□ field work</td><td colspan="3">X independent assignments
X multimedia
X laboratory
□ work with mentor
Xseminars</td></tr>
<tr><td>Student responsibilities</td><td colspan="6"></td></tr>
<tr><td rowspan="6">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)</td><td>Class attendance</td><td>1,0</td><td>Research</td><td>0</td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td>1,5</td><td>Report</td><td>0</td><td>(Other)</td><td></td></tr>
<tr><td>Essay</td><td>0</td><td>Seminar essay</td><td>0</td><td>(Other)</td><td></td></tr>
<tr><td>Tests</td><td>1,0</td><td>Oral exam</td><td>1,5</td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td>4,5</td><td>Project</td><td>0</td><td>(Other)</td><td></td></tr>
<tr><td colspan="6"></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="6">Course is divided into three sections that students take over 3 partial written and 1 oral exam or joining final exam at the end of the semester. The student pass the exam if achieve at least 60%. The final grade is based on the evaluation of partial exams.
Scoring: <60% insufficient; 60-70% sufficient (2); 70-80% good (3); 80-90% very good (4); 90-100% excellent (5)</td></tr>
<tr><td rowspan="4">Required literature (available in the library and via other media)</td><td colspan="3">Title</td><td>Number of copies in the library</td><td colspan="2">Availability via other media</td></tr>
<tr><td colspan="3">S. H. Pine: Organska kemija, Školska knjiga, Zagreb, 1994.</td><td>9</td><td colspan="2">no</td></tr>
<tr><td colspan="3">Vodič kroz IUPAC-ovu nomenkalturu organskih spojeva, preveli:Bregovec, Horvat, Majerski, Rapić, Školska knjiga , Zagreb, 2002.</td><td>1</td><td colspan="2">no</td></tr>
<tr><td colspan="3">I. Jerković, A. Radonić, Praktikum iz organske kemije, Udžbenici Sveučilišta u Splitu, Split, 2009.</td><td>1</td><td colspan="2">Yes, on the official faculty web page</td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="6">V. Rapić: Postupci priprave i izolacije prirodnih spojeva, Školska knjiga, Zagreb, 1994.
S. Borčić, O. Kronja, Praktikum preparativne organske kemije, Školska knjiga Zagreb, 1991.
V.Rapić: Nomenklatura organskih spojeva, Školska knjiga , Zagreb, 2004.
S. E. Meislich, H. Meislich & J. Scharefkin, 3000 Solved Problems in Organic Chemistry, The McGraw-Hill, 1994.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="6">Quality assurance will be performed at three levels:

(1) University Level; (2) Faculty Level by Quality Control Committee; (3) Lecturer’s Level.</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="6"></td></tr>
</table>

Food Microbiology

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="6">Food microbiology</td></tr>
<tr><td>Code</td><td>KTK 202</td><td>Year of study</td><td colspan="5">2</td></tr>
<tr><td>Course teacher</td><td>PhD, Skočibušić Mirjana
Associated Professor</td><td>Credits (ECTS)</td><td colspan="5">5.0</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">PhD, Maravić Ana,
Senior Assistant</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>F</td></tr>
<tr><td>30</td><td>0</td><td>15</td><td>0</td></tr>
<tr><td>Status of the course</td><td>Mandatory</td><td>Percentage of application of e-learning</td><td colspan="5"></td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">Students learn to understand the role of microorganisms in the food processing, preservation and safety and their impact on food spoilage, diseases transmitted by food as well as application of laboratory methods and techniques used in the control of microorganisms and food safety, quality and food safety control and the role of microorganisms in health promotion.</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">Attended General microbiology</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">Students completing this course should be able to:
• understand the role of microorganisms in food processing, preservation and safety;
• describe the factors that influence microbes in food, which can cause food spoilage;
• identify some of the standard methods and some recent rapid and automated methods for detection and enumeration of microorganisms;
• explain the various physical methods of food preservation, the role of antimicrobial chemicals and industrial strategies of ensuring safe foods;
• apply basic skills in isolation, analysis and identification of microorganisms that cause spoilage of food, microorganisms used in the production of food and microorganisms that can cause diseases by consuming contaminated food.
• understand the causes of diseases transmitted by food and its etiology;
• estimate the necessary measures to control undesirable microorganisms in food.
• effectively and collegially work with others in the microbiology laboratory and class setting.</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="6">1. History and development food microbiology. Microbes in foods-characteristics and sources. (2 hours)
2. Microbial Growth Response in the food. Factors influencing microbial growth in food. (2 hours)
3. Microorganisms as indicators of food safety and microbiological criteria GMP, GHP, HACCP. (2 hours)
4. Indicators of food contamination. Determination of the number of fecal coliforms and enterococci in various food samples, and Escherichia coli. (2 hours)
5. Food spoilage-important factors affecting food spoilage; spoilage of different food groups and associated microorganisms. (2 hours)
6. Food poisoning and foodborne infection-Important facts in foodborne diseases; causes of food borne diseases, role of microorganisms, importance of predisposing factors in the occurrence of a foodborne disease; foodborne intoxications; foodborne infections; new and emerging foodborne pathogens. (2 hours)
7. Gram-positive bacteria in food (Staphylococcus aureus, Micrococcus,</td></tr>
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<tr><td></td><td colspan="6">*Enterococcus faecalis*, *Listeria monocytogenes*). Isolation and micromorphology, colonial morphology and biochemical identification. (*2 hours*)
8. Gram-positive sporogenic bacteria (*Bacillus cereus*, *B. anthracis*, *Clostridium perfringens*, *C. botulinum*). Isolation and identification spore forming bacteria. (*2 hours*)
9. Gram-negative bacteria (*Salmonella*, *Shigella, Escherichia coli* O157:H7, *Enterobacter sakazakii, Yersinia enterocolitica*). Isolation and identification Gram-negative bacteria. (*2 hours*)
10. Yeasts and molds mycotoxins (aflatoxins, patulin, ochratoxin, F-2 toxin) in food and feed. (*2 hours*)
11. Viruses: Hepatitis, Rotaviruses Caliciviruses *Norwalk* and Norwalk-like viruses, prions: new variant CJD. (*2 hours*)
12. Worms: *Taenia* and *Trichinella* and Protozoa: *Sarcocystis, Giardia* and *Toxoplasma.* (*2 hours*)
13. Control of microorganisms in foods-Cleaning and sanitation; physical removal, heat, low temperature, Aw, low pH and organic acids, modified atmosphere, antimicrobial preservatives, irradiation. (*2 hours*)
14. Uses of microorganisms in the food industry- microorganisms used in food fermentations; fermented food and beverage production; production of food ingredients and enzymes of microbial origin. (*2 hours*)
15. Special projects: Microbial analysis, isolation and identification of bacteria in different food samples. (*2 hours*)

Lab exercises will include: Enumeration of the total number of bacteria (CFU - standard plate count) milk , water , shellfish and meat. Determination of fecal coliforms and enterococci in various food samples, and *Escherichia coli*. Isolation and identification of Gram-positive bacteria in the food (*Staphylococcus aureus*, *Micrococcus*, *Enterococcus faecalis*, *Listeria monocytogenes*). Enumeration of Gram-positive sporogenic bacteria (*Bacillus cereus*, *B. anthracis*, *Clostridium perfringens*, *C. botulinum*). Isolation and identification of Enterobacteriaceae (*Salmonella*, *Shigella, Escherichia coli* O157:H7, *Enterobacter sakazakii, Yersinia enterocolitica*). Micromorphology, colonial morphology, biochemical identification Gram-negative bacteria (*Campylobacter*, *Vibrio, Pseudomonas aeruginosa).* Yeast and molds and canned foods. Isolation and identification worms: *Taenia* and *Trichinella* and protozoa: *Sarcocystis, Giardia* and *Toxoplasma.* Detection of antimicrobial susceptibility of bacteria in foods.</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒lectures
☒seminars and workshops
☒exercises
□ *on line*in entirety
□ partial e-learning
□ field work</td><td colspan="3">□ independent assignments
☒multimedia
☒laboratory
□ work with mentor
☒project</td></tr>
<tr><td>Student responsibilities</td><td colspan="6">Admission to the lectures in the amount of at least 70% of the times scheduled. Completed all planned laboratory exercises, seminar essay and projects.</td></tr>
<tr><td rowspan="6">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)*</td><td>Class attendance</td><td>1,0</td><td>Research</td><td></td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td>1,0</td><td>Report</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td>0,5</td><td>(Other)</td><td></td></tr>
<tr><td>Tests</td><td>0,5</td><td>Oral exam</td><td>1,0</td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td>0,5</td><td>Project</td><td>0,5</td><td>(Other)</td><td></td></tr>
<tr><td>Grading and evaluating student work in class and at</td><td colspan="6">The final grade of the student is compiled from the combination of lecture, seminar, laboratory and project. Final course grade will be based on: Mid-term exam 30%; End of term exam 35%; Seminar 10%; Project 10%; Lab course 15%. Your course</td></tr>
</table>

<table>
<tr><td>the final exam</td><td colspan="3">grade will be based upon a percentage of total points obtained using the following scale: <60% insufficient; 60-70% sufficient (2); 70-80% good (3); 80-90% very good (4); 90-100% excellent (5).</td></tr>
<tr><td rowspan="5">Required literature (available in the library and via other media)</td><td>Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td>Duraković S., Delaš F., Stilinović B., Duraković L.: Moderna mikrobiologija namirnica - knjiga prva. Sveučilišni udžbenik (ured. S. Duraković). Kugler d.o.o., Zagreb, 2002.</td><td>5</td><td>no</td></tr>
<tr><td>Duraković S., Delaš F., Duraković L.: Moderna mikrobiologija namirnica - knjiga druga. Sveučilišni udžbenik (ured. S. Duraković). Kugler d.o.o., Zagreb, 2002.</td><td>5</td><td>no</td></tr>
<tr><td>Duraković S., Duraković L.: Mikrobiologija namirnica - osnove i dostignuća - knjiga prva. Sveučilišni udžbenik (ured. S. Duraković). Kugler d.o.o., Zagreb, 2001.</td><td>5</td><td>no</td></tr>
<tr><td>Jay, James M.; Loessner, Martin J.; Golden, David A. Modern Food Microbiology. 7th edition, Springer 2005.</td><td></td><td>freely online</td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="3">Montville, T.J., Matthews, K.R &. Kniel, K.E .Food Microbiology: An Introduction Third edition, ASM Press, 2012</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="3">Quality assurance will be performed at different levels: Keeping records of his attendance; Annual performance analysis examination; Student surveys in order to evaluate teachers; Self-evaluation of teachers; Feedback from students who have already graduated from the relevance of content items.</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="3"></td></tr>
</table>

Transport Phenomena

NAME OF THE COURSE	TRANSPORT PHENOMENA					
Code	KTK 203	Year of study	2nd			
Course teacher	PhD, Nenad Kuzmanić, Full Professor	Credits (ECTS)	5.0			
Associate teachers	Renato Stipišić, lect. Antonija Kaćunić, B.Sc.	Type of instruction (number of hours)	L	S	E	F
			45	15	15	
Status of the course	Mandatory	Percentage of application of e-learning	-			
COURSE DESCRIPTION						
Course objectives	Gaining knowledge about the principles of transfer of momentum, heat and mass transfer on the principle of a unified approach to transport phenomena. This knowledge forms the basis of chemical engineering unit operations, and they are therefore essential for a fuller understanding of process engineering.					
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 expected to know: - how to apply the laws of conservation of the fluid flow - about molecular and convective mechanisms of transport of momentum, energy and mass - how to recognize the major resistance at transport phenomena and how to intensifying the observed transfer - how to gain insight into the functional dependence of the characteristics of a given system by the use of similarity theory and dimensional analysis - the analogy of transfer of momentum, energy and mass					
Course content broken down in detail by weekly class schedule (syllabus)	1st week: Introduction to physical transport phenomena. Conservation law. Molecular and convective transport mechanisms. 2nd week: Stationary and non-stationary processes. Rate of transport processes. Momentum, heat and mass fluxes. Fluid characteristics (density, relative density, specific weight...) 3rd week: Momentum transfer. Newton's low of viscosity. Momentum flux. Application of momentum and mass balances in fluid mechanics. 4th week: Application of heat balance in fluid mechanics: Bernoulli equation and its application in process engineering. 5th week: Theories of similarity. Dimensional analysis. Flow phenomena. Laminar flow. Stationary laminar flow between two flat horizontal plates. 6th week: Stationary laminar flow through a horizontal circular tube. Hagen-Poiseuille law. Turbulent flow. Pressure drop in straight channels and in pipe systems. Moody diagram. 7th week: Flow around obstacles. Rate of sedimentation. 8th week: Flow through beds of particles. Fluidization. 9th week: Fundamental principles of heat transfer. Stationary heat conduction. Heat conduction through walls and through cylindrical walls. 10th week: Heat transfer by forced convection. Thermal boundary layer. Partial and overall heat transfer coefficients. Heat transfer during laminar and turbulent flows in pipes. Heat transfer during condensation.					

	11th week: Heat transfer during boiling. Heat transfer around obstacles. Heat transfer during natural convection. 12th week: Heat transport by radiation. 13th week: Fundamental principles of mass transfer. Stationary diffusion. Equimolar counterdiffusion and one-component diffusion. 14th week: Mass transfer with forced convection. Mass transfer by natural convection. 15th week: Interphase mass transfer. Analogy between heat and mass transfer. Laboratory exercises: Determination of fluid flow type and the critical Reynolds number; Applying the Bernoulli's theorem: Dynamic and Surface Flow Meters - Calibration of orifice plate and rotameter; Determination of pressure drop in the pipeline; Determination of particle sedimentation rate in a stationary fluid. Determination of fluidized bed characteristics; Determination of partial and overall heat transfer coefficients; Complex heat transfer by radiation and convection; Interphase mass transfer.
Format of instruction	**x** lectures □ seminars and workshops **x** exercises □ *on line* in entirety □ partial e-learning □ field work □ independent assignments **x** multimedia **x** laboratory □ work with mentor **x** seminars
Student responsibilities	Lecture attendance: 80 %. Laboratory 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	1.5	Research		Practical training	0.5
	Experimental work	0.5	Report		Exercises tests study (Other)	0.5
	Essay		Seminar essay		Field work (Other)	
	Tests		Oral exam	1.2	(Other)	
	Written exam	0.8	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. Test passing score is 55%. Students who do not pass the partial exams have to take an exam in the regular examination periods. The exam consists of theoretical (oral) and written part. Exam passing score is 55%. Written part will constitute 25% and the theoretical part of the exam 45 % of the test score. Laboratory exercises (passing score 50-100%) will constitute 30% of the final score. Grades depending on the test score: 55% - 65% - satisfactory, 66% -77% - good, 78% -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**
	W. J. Beek, K. M. K. Muttzall, J. W. van Heuven, Transport Phenomena, 2nd ed., J. Wiley and Sons Inc., London, 1999.	3	
	N. Kuzmanić, Prijenos tvari i energije, Priručnik za predavanja (for internal use only), Kemijsko-tehnološki fakultet u Splitu, Split, 2012.		Web site of institution
	R. Byron Bird, W. E. Stewart, E. N. Lightfoot, Transport Phenomena, 2nd ed., J. Wiley and Sons Inc., New York, 2002.	2	
	J. Welty, J. W. Wicks, R. E. Wilson, G. L. Rorrer,	2	

	Fundamentals of Momentum, Heat and Mass Transfer, 5th ed., J. Wiley & Sons Inc., New York, 2007.		
Optional literature (at the time of submission of study programme proposal)	E. Mitrović-Kessler: Prijenos tvari i energije, Tehnološki fakultet Split, Split, 1991		
Quality assurance methods that ensure the acquisition of exit competences	Quality of the teaching and learning, monitored at the level of the (1) teachers, accepting suggestions of students and colleagues, and (2) faculty, conducting surveys of students on teaching quality.		
Other (as the proposer wishes to add)			

Introduction to Food Technology

NAME OF THE COURSE	Introduction to Food Technology					
Code	KTK204	Year of study	2.			
Course teacher	PhD, Višnja Katalinić, Full Professor	Credits (ECTS)	3.0			
Associate teachers	PhD, Ivana Generalić Mekinić Danijela Skroza, dipl.ing.	Type of instruction (number of hours)	L	S	E	F
			15	15		
Status of the course	Mandatory	Percentage of application of e-learning	0			

COURSE DESCRIPTION		
Course objectives	Students get aquainted with field of work and food technology development guidelines.	
Course enrolment requirements and entry competences required for the course	No	
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Upon successful completion of this course, students will be able to: - identify the work /research area of Food science; Food engineering and Food technology; - define and explain the basic principles of division of food technologies considering: a) row materials /products and b) processing techniques - describe the difference between technological and unit processes in food industry - indicate basic food quality parameters - understand the importance and know how to use legal regulations pertaining to food safety and quality - understand development trends in food sector	
Course content broken down in detail by weekly class schedule (syllabus)	1st week: Global food needs: current situation and future trends 2nd week: Field of food science and technology 3rd -4th week: Food science and food engineering as a base of food industry development (major discoveries) 5h week: Categories of food technologies (according to the row materials/products and processing techniques) 6th week: Technological process flow-chart 7th week: 1. colloquium 8th -9th week: Insight into Selected food production procesess 10th week: Food quality (consumer demands; government regulations) 11th week-12th week: Food safety considerations; government regulations pertaining to food safety 13th week: The largest food and beverage comapnies (RH, world) and their most important products 14th week: Development trends in food sector 15th week: 2. colloquium	
Format of instruction	x lectures x seminars and workshops □exercises □*on line*in entirety □partial e-learning □field work	□independent assignments x multimedia □laboratory □work with mentor □ (other)
Studentresponsibilities	Admission to the lectures and seminars of at least 70% of the times scheduled.	

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	Research		Practical training	
	Experimental work		Report		(Other)	
	Essay		Seminar essay	1.0	(Other)	
	Tests	1.0	Oral exam	(0.5)	(Other)	
	Written exam	(0.5)	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**
	P. Fellows, Food Processing Technology, 2nd Edition CRC Press, 2000;		Yes
	G. Campbell-Platt, Food Science and Technology, John Wiley & Sons, Ltd., 2009.		Yes
Optional literature (at the time of submission of study programme proposal)	Professional / Scientific Articles chosen by lecturer		
Quality assurance methods that ensure the acquisition of exit competences	Quality of the teaching and learning, monitored at the level of the (1) teachers, accepting suggestions of students and colleagues, and (2) faculty, conducting surveys of students on teaching quality.		
Other (as the proposer wishes to add)			

Raw Materials in Food Industry

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">Raw Materials in Food Industry</td></tr>
<tr><td>Code</td><td>KTK 205</td><td>Year of study</td><td colspan="4">I</td></tr>
<tr><td>Course teacher</td><td>Ph.D. Tea Bilusic, Full Professor</td><td>Credits (ECTS)</td><td colspan="4">4.0</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2"></td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>F</td></tr>
<tr><td>30</td><td>15</td><td>0</td><td>0</td></tr>
<tr><td>Status of the course</td><td>Mandatory</td><td>Percentage of application of e-learning</td><td colspan="4"></td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">Acquiring a basic knowledge on
- main classes of food
- nutritive and non-nutritive food components
- chemical composition of food from different classes: cereals, fruits, vegetables, milk and dairy products, fish, oils, conditors
- the influence of processing and food preparation on change of the chemical composition of food
- the understanding of processing influence as well as storage conditions on change of the chemical composition of food</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6"></td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">After completing the course, the student will become familiarized with the major concepts of raw materials in food industry, which includes:
- to distinguish the food belonging to different food classes
- to apply the optimal parameteres for protection of nutritive value and chemical composition of food
- to identify the risks for food safety
- to apply optimal parameters of processing of food in order to keep the chemical composition and nutritive value</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="6">1. Introduction. Classification of food. L (2h)
2. Plant-derived foods: Cereals. L (2h), S (1h)
3. Plant-derived foods: Fruits. L (2h), S (1h)
4. Plant-derived foods: Vegetables. L (2h), S (1h)
5. Plant-derived foods: Mushrooms. L (2h), S (1h)
6. Plant-derived foods: Oilseeds. L (2h), S (1h)
7. Animal-derived foods: Red meat. L (2h), S (1h)
8. Animal-derived foods. White meat. L (2h), S (1h)
9. Animal-derived foods: Milk and dairy products. L (3h), S (1h)
10. Animal-derived foods: Fish. L (2h), S (1h)
11. Animal-derived foods: Crustaceans. L (2h), S (1h)
12. Food additives. L (2h), S (1h)
13. Parameters for optimal storing of food. L (3h), S (1h)
14. Parameteres for optimal preparation of food. P (3h), S (1h)</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒ lectures
☒ seminars and workshops
□exercises
□on linein entirety</td><td colspan="3">□independent assignments
☒ multimedia
□laboratory
□work with mentor</td></tr>
</table>

<table>
<tr><td></td><td colspan="6">□partial e-learning
□field work</td><td colspan="2">□ (other)</td></tr>
<tr><td>Studentresponsibilities</td><td colspan="8">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</td></tr>
<tr><td rowspan="6">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)</td><td>Class attendance</td><td>1</td><td>Research</td><td></td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td></td><td>Report</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td>0.5</td><td>(Other)</td><td></td></tr>
<tr><td>Tests</td><td>0.5</td><td>Oral exam</td><td>2</td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td></td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td colspan="8"></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="8">During semester, two written exams are provided (as partical 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.</td></tr>
<tr><td rowspan="4">Required literature (available in the library and via other media)</td><td colspan="5">Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td colspan="5">T. Bilušić: Introduction to Food Science, revised lectures, KTF, 2013. g.</td><td></td><td>KTF web page</td></tr>
<tr><td colspan="5">Lj. Tratnik. Mlijeko – tehnologija, biokemija i mikrobiologija, HMU, Zagreb, 1998.</td><td>3</td><td>KTF web page</td></tr>
<tr><td colspan="5">B. Šimundić, V. Jakovljević, V. Tadejević. Poznavanje robe. Tiskara Rijeka, 1994.</td><td>1</td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="8">N. Potter, J. Hotchkiss: Food Science, Fifth edition, 1998, Aspen Publication</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="8">• registration of student's presence in class
• annual analysis of students success in this course
• student's survey in order to evaluate the professor
• professor's self-evaluation</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="8"></td></tr>
</table>

Biochemistry

NAME OF THE COURSE	Biochemistry					
Code	KTK206	Year of study	2.			
Course teacher	Mladen Miloš	Credits (ECTS)	7.0			
Associate teachers	Franko Burčul, Ivana Carev, Maja Marasović	Type of instruction (number of hours)	L	S	E	F
			45	15	30	
Status of the course	Mandatory	Percentage of application of e-learning	20%			

COURSE DESCRIPTION		
Course objectives	During this course the students learn the basis of biochemistry.	
Course enrolment requirements and entry competences required for the course	First year of study.	
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	- Understand the basic principles of protein structure and their impact on the structure of biological function. - Understand the basic principles of enzyme kinetics and inhibition of enzyme activity. - Know and explain the basic concepts and principles of metabolism. - Know and explain the structure of biological membranes. - Understand the structure and biological function of nucleic acids. - Understand the ways of conducting signals in living organisms.	
Course content broken down in detail by weekly class schedule (syllabus)	History of biochemistry (1 hour) . Elementary constitution of living organisms (1 hour). Water, bioelements, biomolecules and kinds of chemical bonds in living organisms. Exchanges of energy between cell and environment (2 hours). Amino acid (1 hour). Peptides and proteins (1 hour). Structure, chemical and biological properties of proteins (2 hours). Myoglobin and hemoglobin (2 hours). Enzymes (1 hour). Enzyme catalysis and regulation of biochemical processes (2 hours). Nonprotein catalysts: ribosimes, coenzymes and vitamins (1 hour). Carbohydrates and Glycoconjugates. Chemical properties nad biological role of carbohydrates (3 hours). Lipids. Fats, phospholipids, glycolipids and sphingolipids: chemical properties and biological role (2 hours). Biomembranes. Common features of biological membranes. Membrane proteins and membrane transport (2 hours). Purine and pyrimidine bases, nucleosides, nucleotides, nucleic acid, chemical and physical properties (2 hours). Structure and biological properties of RNA and DNA (1 hour). The discoveries of RNA and DNA (2 hours). Energy in biological systems. ATP as the universal currency of free energy in biologic systems. Electrochemical and concentrational gradients. Ireversible and reversible processes. A thermodynamically unfavorable reaction can be driven by a favorable one (3 hours). Metabolism: basic concepts and design (1 hour). Carbohydrate catabolism - glycolysis (1 hour). Fatty acid catabolism - β-oxidation (1 hour). Protein catabolism - amino acid catabolism and the urea cycle (1 hour). Citric acid cycle. Oxidative phosphorylation (2 hour). Basic principles of cell signaling (3 hours). *Laboratory exercises*: Acid-base properties of amino acids (6 hours). Qualitative and quantitative determination of proteins (6 hours). Enzymes (6 hours). Isolation and detection of lipids and phospholipids (6 hours). Qualitative detection of carbohydrates (6 hours).	
Format of instruction	**x** lectures **x** seminars and workshops **x** exercises **x** *on line* in entirety **x** partial e-learning	**x** independent assignments **x** multimedia **x** laboratory □ (other)

<table>
<tr><td>Student responsibilities</td><td colspan="6">Class attendance, perform lab exercises and preparation of seminar papers</td></tr>
<tr><td rowspan="5">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)</td><td>Class attendance</td><td>2.5</td><td>Research</td><td></td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td>2.0</td><td>Report</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td>1.0</td><td>(Other)</td><td></td></tr>
<tr><td>Tests</td><td>0.5</td><td>Oral exam</td><td>0.5</td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td>0.5</td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="6">Partial exams. Oral examination.</td></tr>
<tr><td rowspan="3">Required literature (available in the library and via other media)</td><td colspan="3">Title</td><td>Number of copies in the library</td><td colspan="2">Availability via other media</td></tr>
<tr><td colspan="3">Biochemistry , J.M. Berg, J.L. Tymoczko and L. Stryer, Translation VI edition, Školska knjiga Zagreb, 2013</td><td>4</td><td colspan="2">Školska knjiga Zagreb</td></tr>
<tr><td colspan="3">Lectures of basic biochemistry, Mladen Miloš</td><td>-</td><td colspan="2">Web page of Faculty</td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="6">Harper's illustrated biochemistry, R.K. Murray, D.A. Bender, K.M. Botham, P.J. Kennelly, V.W. Rodwell, P.A. Weil, Medicinska naklada, Zagreb, 2011.

Cell, G.M. Cooper, R.E. Hausman, Medicinska naklada, Zagreb, 2010.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="6">Quality of the teaching and learning, monitored at the level of the (1) teachers, accepting suggestions of students and colleagues, and (2) faculty, conducting surveys of students on teaching quality.</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="6"></td></tr>
</table>

Unit Operations

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">UNIT OPERATIONS</td></tr>
<tr><td>Code</td><td>KTK 207</td><td>Year of study</td><td colspan="4">2nd</td></tr>
<tr><td>Course teacher</td><td>PhD, Marija Ćosić, Assistant Professor</td><td>Credits (ECTS)</td><td colspan="4">7.0</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Renato Stipišić, lect.
Antonija Kaćunić, B.Sc.</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>F</td></tr>
<tr><td>45</td><td>15</td><td>30</td><td></td></tr>
<tr><td>Status of the course</td><td>Mandatory</td><td>Percentage of application of e-learning</td><td colspan="4">-</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">Students gain knowledge about the basic unit operations in the process engineering through theoretical expressions based on the mass and energy balances. Students are also acquainted with the working principles of the most used devices and selection of their optimum working conditions regarding minimization of energy consumption and product quality.</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6"></td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">After passing the exam the student is expected to know:
– fundamental principles of mechanical and of heat and mass transfer operations
– explain the laws that follow performance of each of the various operation
– explain the influence of operating variable on each operation
– bring up the most common used equipment for particular operation and explain their working principle
– for a given process, select the equipment that would be the most effective
– some of the most common operating problems encountered in the process industry</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="6">1st week: Introduction to chemical engineering processes. Fluid transport.
2nd week: Coarse dispersed systems. Milling.
3rd week: Classification. Granulometric analysis.
4th week: Separation. Classification and separation equipment.
5th week: Filtration theory. Filtration equipment.
6th week: Mixing of Newtonian and non-Newtonian fluids.
7th week: Mixing of particulate solids. Selection and dimensioning of mixing equipment.
8th week: Heat and mass transfer operations. Heat exchangers.
9th week: Condensers and vaporizers.
10th week: Theory of absorption and absorption equipment.
11th week: Drying in process engineering. Drying equipment.
12th week: Crystallization. Crystallization equipment.
13th week: Distillation.
14th week: Rectification and stripping. Fractionation.
15th week: Theory of extraction and leaching. Extraction equipment.

Laboratory exercises:
Milling - determination of the degree of particle size reduction. Particle size classification. Mixing - power consumption determination. Filtration - determination of filtration coefficient and filtration cake resistance. Heat exchanger - determination of overall heat transfer coefficient. Absorption. Drying rate determination. Crystallization – determination of nucleation and crystal growth rate. Distillation - determination of the number of theoretical plates.</td></tr>
</table>

<table>
<tr><td>Format of instruction</td><td colspan="6">x lectures
□ seminars and workshops
x exercises
□ on line in entirety
□ partial e-learning
□ field work</td><td colspan="2">□ independent assignments
x multimedia
x laboratory
□ work with mentor
x seminars</td></tr>
<tr><td>Student responsibilities</td><td colspan="8">Lecture attendance: 80 %. Laboratory exercises attendance: 100 %.</td></tr>
<tr><td rowspan="6">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)</td><td>Class attendance</td><td>2.5</td><td>Research</td><td></td><td>Practical training</td><td colspan="2">1.0</td></tr>
<tr><td>Experimental work</td><td>0.5</td><td>Report</td><td></td><td>Exercises tests study (Other)</td><td colspan="2">0.5</td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>Field work (Other)</td><td colspan="2"></td></tr>
<tr><td>Tests</td><td></td><td>Oral exam</td><td>1.5</td><td>(Other)</td><td colspan="2"></td></tr>
<tr><td>Written exam</td><td>1.0</td><td>Project</td><td></td><td>(Other)</td><td colspan="2"></td></tr>
<tr><td colspan="8"></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="8">During the semester student may take the exam by two theoretical (oral) and two calculation (written) tests. Test passing score is 55%. After passing all tests the average score for oral and written parts is calculated and the grade for each part is determined by the following criteria: 55%-66% - satisfactory, 67%-78% - good, 79%-89% - very good, 90%-100% - excellent.
The final grade is calculated form the grades obtained for oral and written part and from exercises. For laboratory exercises passing score is also 55 %. Theoretical part constitutes 50% of grade while written part and exercises by 25 %. Students who do not pass the partial exams have to take an exam in the regular examination periods. The exam consists of theoretical (oral) and written part. Final grade is determined by previously notated criteria.</td></tr>
<tr><td rowspan="4">Required literature (available in the library and via other media)</td><td colspan="5">Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td colspan="5">W. L. McCabe, J. C. Smith, P. Harriot, Unit Operations of Chemical Engineering, seventh ed., McGraw-Hill, New York, 2004.</td><td>2</td><td></td></tr>
<tr><td colspan="5">C. J. Geankoplis, Transport Prosesses and Separation Process Principles (Includes Unit Operations), fourth ed., Pearson Eucation, Inc.,New Jersey, 2007.</td><td>1</td><td></td></tr>
<tr><td colspan="5">Hraste, Mehaničko procesno inženjerstvo, 2. izdanje, HINUS, Zagreb, 2003.</td><td>5</td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="8">J. Welty, J. W. Wicks, R. E. Wilson, G. L. Rorrer, Fundamentals of Momentum, Heat and Mass Transfer, fifth ed., J. Wiley and Sons Inc., New York, 2007.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="8">Quality of the teaching and learning, monitored at the level of the
(1) teachers, accepting suggestions of students and colleagues, and
(2) faculty, conducting surveys of students on teaching quality</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="8"></td></tr>
</table>

Thermodynamics

NAME OF THE COURSE	Thermodynamics					
Code	KTK 208	Year of study	2.			
Course teacher	PhD, Vanja Martinac, Full Professor	Credits (ECTS)	3.0			
Associate teachers		Type of instruction (number of hours)	L	S	E	F
			15	15		
Status of the course	Mandatory	Percentage of application of e-learning	-			
COURSE DESCRIPTION						
Course objectives	The course of Thermodynamics covers the basics of general thermodynamic principles and their application in engineering. The goal is for students to master the knowledge of basic thermodynamic principles and their application in engineering, which will be helpful in their further studies as well as in their work.					
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, students are expected to: - specify and define the units of measurements of basic thermodynamic magnitudes and the state equation - specify and correctly interpret the basic laws of thermodynamics - specify and explain thermodynamic changes of the state of ideal gases - define and explain the processes of expansion and compression - define and explain cycles processes - define and explain irreversible processes (throttling, mixing of gases) - specify and describe heat properties and changes of the state of real gases - discern and analyse processes in devices used to obtain low temperatures - define thermodynamic properties of moist air and processes with moist air - apply the knowledge acquired to solving tasks related to changes of the state of ideal and real gases and liquids, compression processes, cycles processes, processes in devices used to obtain low temperatures and processes with moist air.					
Course content broken down in detail by weekly class schedule (syllabus)	1st week: General concepts. Heat and energy parameters in thermodynamic processes. 2nd week: Basic laws of thermodynamics. The first law of thermodynamics using internal energy and enthalpy. 3rd week: Thermodynamic changes of the state of ideal gases (isobaric, isochoric, isothermal, adiabatic and polytrophic changes of state). 4th week: The second law of thermodynamics, reversibility, irreversibility, thermal diagram and changes of the state in thermal diagrams. 5th week: Cycles processes. Carnot and thermal efficiency degree. 6th week: Compression and expansion processes. 7th week: Processes with external and internal combustion. Exam (I preliminary exam) 8th week: Real gases: liquid state, evaporation, wet and dry saturated steam, superheated steam, fundamental processes. 9th week: Thermal properties and changes of the state of real gases. Thermodynamics diagrams and tables for variables of state. 10th week: Water vapour – thermodynamic parameters of the state. 11th week: Vapour power cycles 12th week: Thermodynamic fundamentals of the cooling process. Vapor-compression refrigeration. Coefficient of performance. 13th week: Processes in devices for gas liquefaction.					

	14th week: Moist air. 15th week: Processes with moist air. Exam (II preliminary exam) Numeric examples demonstrating the topics covered are analysed during the course, making an integral whole with the lectures.
Format of instruction	**x** lectures □seminars and workshops □exercises □*on line* in entirety □partial e-learning □field work □independent assignments **x** multimedia □laboratory □work with mentor **x** seminar (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	1.0	Research		Practical training	
	Experimental work		Report		(Other)	
	Essay		Seminar essay		(Other)	
	Tests	0.8	Oral exam	0.6	(Other)	
	Written exam	0.6	Project		(Other)	

Grading and evaluating student work in class and at the final exam	Attendance to lectures and seminars is registered (not included in the rating). A written and an oral exam are held in the examination periods. The passing threshold is 60 %. The oral exam is mandatory for all students, and the written exam is mandatory if a student is not exempt from it. Continuous assessment through partial preliminary exams (twice in a semester) allows for exemption from the written exam. The passing threshold is 60 %. Partial preliminary exams are not mandatory. Preliminary exams are not eliminatory. Each passed preliminary exam participates with 25 % in the rating. A passed preliminary exam also participates with 25 % in the autumn examination period. The written exam participates with 25 %, and the oral one with 50 %. Students who have not passed the written exam through preliminary exams take the full exam (final exam) consisting of the written and the oral exam in regular examination periods. The passing threshold is 60 %, and each exam form participates in the rating with 50 %. Ratings: 60 %-70 % - satisfactory, 71 %-80 % - good, 81 %-90 % - very good, 91 %-100 % - excellent.

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	M. J. Moran, H. N. Shapiro, D. B. Daisie, M. B. Bailey, Fundamentals of Engineering Thermodynamics, 7th Ed., Wiley, New York, 2010.	2	
	N. Petric, I. Vojnović, V. Martinac, Technical thermodynamics (in Croatian), 2nd Ed., on line (2007-01-09), Faculty of Chemistry and Technology, Split, 2007.		On line
	V. Martinac, Thermodynamics and Thermotechnics, Handbook-Formulas and Tables, (in Croatian), on line (2008-12-09), Faculty of Chemistry and Technology, Split, 2008.		On line

Optional literature (at the time of submission of study programme proposal)	Y. A. Cengel, M. A. Boles, Thermodynamics: An Engineering Approach, 7th Ed., McGraw-Hill, New York, 2011. R. E. Sonntag, C. Borgnakke, G. J. Van Wylen, Fundamentals of thermodynamics, 8th Ed., Wiley, New York, 2012.

Quality assurance methods that ensure the acquisition of exit competences	Quality of the teaching and learning, monitored at the level of the (1) teachers, accepting suggestions of students and colleagues, and (2) faculty, conducting surveys of students on teaching quality.
Other (as the proposer wishes to add)	

Measuring and Control Technique

NAME OF THE COURSE	Measuring and Control Techique					
Code	KTK 209	Year of study	2.			
Course teacher	Renato Stipišić, Lecturer	Credits (ECTS)	5.0			
Associate teachers		Type of instruction (number of hours)	L	S	E	F
			30		30	
Status of the course	Obligated	Percentage of application of e-learning				
COURSE DESCRIPTION						
Course objectives	Acquisition of knowledge in working with measuring instruments to control the process and the acquisition of knowledge in the theory of process control.					
Course enrolment requirements and entry competences required for the course	Undergraduate courses: Physics, Computer application, Mechanical engineering.					
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	After passing the exam the student is expected to know: - basic principles of measuring instruments - choose a quality instrument is required to measure the physical quantities essential for process control - spot the sources of error in measuring - principles of automatic process control - elements of the control loop and their assignment					
Course content broken down in detail by weekly class schedule (syllabus)	First week: Description and view the contents of the lecture. The principles of the measurement. General characteristics of the measuring instruments. Second Week: Pressure Measurement. Division of pressure instruments. Liquid manometers. 3rd week: Manometers with solid weights. Deformation manometers. Vakuummeters. 4th week: Temperature measurement. Dilatation thermometers. Thermocouples. 5th week: Heat resistant thermometers. Radiation pyrometers. 6th week: Flow measurement. Dynamic flowmeters. Surface flowmeters. 7th week: Turbine flowmeters. Flowmeters based on fluid properties. 8th week: Ionization flowmeters. The ultrasonic flowmeters. Fluid velocity sensors. 9th week: Level measurement of liquids and solids. Examination I 10th week: Introduction to process control. Basic concepts and procedures. 11th Week: Types of process control. Examples process control. 12th week: The outline view of the control loop. Property of the control loop. 13th week: Synthesis and analysis of the control loop. 14th week: Regulators. 15th week: Control valves. Other components in the control loop. Examination II Exercises: 1. Static characteristics of the measuring instrument. 2. Dynamic characteristics of the measuring instrument. 3. Simulation of kinetics. 4. Laplace transform.					

	5. Systems of first order. 6. Determination of transfer functions. 7. Analysis of system with no controller and with P and PI controller. 8. Analysis of the chemical reactions kinetics.
Format of instruction	X lectures seminars and workshops X exercises *on line*in entirety partial e-learning field work independent assignments X multimedia laboratory work with mentor (other)
Studentresponsibilities	Attendance at lectures in the amount of 80% of the hourly rate. Attendance of the exercises in the amount of 100% of the hourly rate.

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	2	Research		Practical training	1.5
	Experimental work		Report	0.5	(Other)	
	Essay		Seminar essay		(Other)	
	Tests		Oral exam	1	(Other)	
	Written exam		Project		(Other)	

Grading and evaluating student work in class and at the final exam	The entire test can be applied over two written exams during the semester. Passing threshold is 60%. Each exam involved in the assessment with 50%. The examination periods shall be taken oral exam. Passing threshold is 60%. Rating: 60 - 69% - sufficient (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**
	J. Božičević Temelji automatike I, Školska knjiga, Zagreb, 1992.	16	
	J. Božičević Temelji automatike II, Školska knjiga, Zagreb, 1992.	16	
	R. Žanetić, R. Stipišić, Mjerni pretvornici u procesnoj industriji, Skripta za internu upotrebu, KTF- Split, 2005.	3	web
	R. Žanetić, Vođenje procesa u proizvodnji, Skripta za internu upotrebu, KTF- Split, 2006.	3	web

Optional literature (at the time of submission of study programme proposal)	1. Seborg, D. E., T. F. Edgar & D. A. Mellichamp, Process Dynamics and Control, 2nd ed., John Wiley & Sons, New York, 2010. 2. W. Altman, D. Macdonald, Practical Process Control for Engineers and Technicians, Elsevier, London, 2005.
Quality assurance methods that ensure the acquisition of exit competences	- Monitoring suggestions and reactions of students throughout the semester - Student survey
Other (as the proposer wishes to add)	

Processes in Food Industry

NAME OF THE COURSE	Processes in Food Industry					
Code	KTK210	Year of study	2.			
Course teacher	PhD, Višnja Katalinić, Full Professor	Credits (ECTS)	7.0			
Associate teachers	Ivana Generalić Mekinić, PhD Danijela Skroza	Type of instruction (number of hours)	L	S	E	F
			45	15	20	10
Status of the course	Mandatory	Percentage of application of e-learning				
COURSE DESCRIPTION						
Course objectives	The course is designed to give basic knowledge of food processing principles and applications. By the end of the course student should know the meaning of the major, general and specific, operations in food-processing engineering. Student should know the most important principles of food preservation and understand the basic principles and applications for major food processing techniques of commercial importance.					
Course enrolment requirements and entry competences required for the course						
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Upon successful completion of this course, student will be able to: - define different food sector activities and major processes in the food-process engineering, - define objectives and methods of the basic preparatory and specific operations in the food industry, - understand the significance and basic principles of food conservation, - describe and understand food thermal processing methods - define and understand food low-temperature preservation methods (cooling, freezing) - understand the water activity concept and the implementation of environment control in food degradation control and contamination limitation - know and understand the methods of food preservation by dehidratation - describe fermentation and explain food bioconversion principles - describe methods of conservation through addition of sugar, salt and preservatives - understand basic principles of food conservation using microwaves and ionizing radiation					
Course content broken down in detail by weekly class schedule (syllabus)	1st week: Introduction to process operation; Common terms and definitions; Classification of processing techniques; The major processes in food-processing engineering 2nd week: Mechanical and physical processes; general-preliminary and specific operations in food industry; removing of impurities; separation; removing of inedible parts; sorting, grading,...). 3rd week: Specific operations: emulsification/; extrusion; operations specific for chocolate manufacturing: refining, conching, tempering; depectination 4th week: Importance of food conservation; The main causes of food spoilage; GMP. 5th week: Thermal processing: (Classification an principles of thermal processes; Thermal resistance of microorganisms; Lethality concept; Characterization of heat penetration date and thermal process calculation for pasteurization 6th week: Commercial Canning operation: raw material selection, washing; sorting/grading; blanching; peeling/preparation, filling; Thermal processes equipment; Quality improvement in thermal processed food; Novel thermal processing techniques);					

	7th week: Low-temperature conservation; Refrigerated storage and common storage systems; CA 8th week: I. Colloquium 9th week: Food freezing: Thermo-physical properties of food undergoing freezing; The freezing process; Freezing time and rate; Thawing time prediction; Freezing methods; Commercial freezing equipment; Quality and stability of frozen food. 10th week: Food dehydration (Concept of water activity; Dehydration fundamentals; Common drying systems; Novel drying techniques; Quality and storage stability of dehydrated foods; Trends) 11th week: Separation and Concentration (Introduction, Evaporation, Membrane processing; Freeze Concentration; Extraction; Supercritical fluid extraction; Osmotic dehydration; Future trends) 12th week: Fermentation practices and principles involved in the bioconversion of foods. Food preservation by the use of sugar, salt and preservatives 13th week: The principles involved in microwave and ionizing radiation for the preservation of foods 14th week: Food packaging: Packaging materials and their transport and other properties; The atmosphere in package (Vacuum; CAP; MAP; Active packaging) 15th week: II. Colloquium *Exercises*: Creation of the scheme of selected technological process; Application of some actions in the selected product processing: a) mechanical and thermal operations in processing raw materials (washing, cleaning, sorting, calibration, peeling, pitting, cutting, blanching, dipping, cooking, frying, roasting); b) preservation and changes during the food preservation (cooling, freezing, drying, concentrating, biological preservation, application of natural and chemical additives); c) packaging materials and shapes, labelling. Calculating the degree of process utilization; Normative calculations for different food products**;** Students visit to selected food industries.
Format of instruction	x lectures x seminars and workshops x exercises □ *on line* in entirety □ partial e-learning x field work □ independent assignments x multimedia x laboratory □ work with mentor □ (other)
Studentresponsibilities	Admission to the lectures and seminars of at least 70% of the times scheduled. Students are required to attend laboratory practice and field work 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	2.0	Research		Practical training	1.0
	Experimental work		Report		Field work	0.5
	Essay		Seminar essay	0.5		
	Tests	3.0	Oral exam	(1.5)	(Other)	
	Written exam	(1.5)	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. Herceg “Procesi u prehrambenoj industriji“ Plejada, Zagreb, 2011	1	

	Z. Herceg „ Procesi konzerviranja hrane“, Golden marketing-Tehnička knjiga, zagreb 2009.	1	
	T. Lovrić, Procesi u prehrambenoj industriji s osnovama prehrambenog inženjerstva, Hinus, Zagreb, 2003;	2	
	G. Campbell-Platt, Food Science and Technology, John Wiley & Sons, Ltd., 2009		Yes
Optional literature (at the time of submission of study programme proposal)	H. Ramswamy, M. Marcotte, Food processing: Principles and Applications. Taylor&Francis, Boca Raton, 2006. Z. Berk, Food Process Engineering and technology; 1st edition; Academic Press, Elsvier, Amsterdam, 2009 J.G. Brennan, Food processing handbook, Wiley-VCH, Weinheim, 2005 P. Fellows, Food Processing Technology, 2nd Edition CRC Press, 2000; M.S. Lewis, Physical properties of Foods and Food Processing Systems, VCH Publishers, 1987.		
Quality assurance methods that ensure the acquisition of exit competences	Quality of the teaching and learning, monitored at the level of the (1) teachers, accepting suggestions of students and colleagues, and (2) faculty, conducting surveys of students on teaching quality.		
Other (as the proposer wishes to add)			

Food Chemistry

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="6">Food Chemistry</td></tr>
<tr><td>Code</td><td>KTK 301</td><td>Year of study</td><td colspan="5">3.</td></tr>
<tr><td>Course teacher</td><td>Mladen Miloš,</td><td>Credits (ECTS)</td><td colspan="5">6.0</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Ivana Generalić Mekinić</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>F</td></tr>
<tr><td>45</td><td>15</td><td>45</td><td></td></tr>
<tr><td>Status of the course</td><td>Mandatory</td><td>Percentage of application of e-learning</td><td colspan="4"></td></tr>
<tr><td colspan="6">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="5">Students will be introduced in major food components (water, proteins, enzymes, lipids, aroma substances, minerals, vitamins) and their changes during the food processing, preservation and storage.
They will understand the contribution of the one food component in total food quality and will learn about chemical, biochemical and physical processes in food systems.
Students will be familiarized with interactions between food ingredients and additives during the processing, preservation and storage.</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="5">Basic knowledge of chemistry, biochemistry and food microbiology as well as terms and facts from courses Processes in Food Industry and Raw materials in Food Industry.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="5">After passing the exam the student will:

- Know the major food components and understand their changes (chemical, physical, biochemical, microbiological, enzymatic, etc.) during the food processing, preservation and storage.
- Recognize the potential degradation processes in food materials regarding the handling.
- Know the parameters that affect the degradation processes and actions which could those degradations prevent/slow down/delay.
- Know functional, nutritive and toxicological food parameters.</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="5">1st week: What is food chemistry? Water: structure, phases of matter, properties, water activity, water food interactions.
2nd and 3rd week: Amino Acids, Peptides and Proteins: classification, representative compounds, chemical and enzymatic reactions during processing and storage.
4th and 5th week: Enzymes: mechanisms and kinetics of the enzyme-catalyzed reactions; enzyme activity: effect of pH, temperature, pressure, water, most important enzymes and enzymatic reactions during food processing.
6th week: Lipids: classification, lipids in diet, cholesterol, changes of lipids during food processing and storage (enzymatic reactions, oxidation processes).
7th week: I. colloquium
8th week: Carbohydrates: classification, structure, properties, representative compounds,
9th week: Chemical reactions of carbohydrates (reduction, caramelization, Maillard reaction, Strecker reaction...).
10th week: Aroma substances: basic terms (threshold value, aroma value, off-flavors), individual aroma substances, interactions with other food constituents.
11th week: Vitamins: classification, vitamins in food, biological role, stability and degradation of vitamins. Minerals: main and trace elements.
12th week: Functional food components.
13th week: Food additives.
14th week: Food contamination (toxins).
15th week: II. colloquium
Exercises: Food analysis: Water content determination; Determination of proteins</td></tr>
</table>

	and amino acids; Determination of lipids; Determination of sugars; Determination of vitamins and minerals; Determination of additives.Changes of food components during processing: Protein hydrolysis and coagulation; Lipid oxidation kinetic; enzymatic reactions during food processing; Carbohydrate changes; Influence of the processing and storage parameters on pigmentation and vitamin content.
Format of instruction	**x** lectures **x** seminars and workshops **x** exercises □ *on line* in entirety □ partial e-learning □ field work **x** independent assignments **x** multimedia □ laboratory □ work with mentor □ (other)
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 each activity so that the total number of ECTS credits is equal to the ECTS value of the course)*						
	Class attendance	2.0	Research	0.5	Practical training	1.0
	Experimental work		Report		(Other)	
	Essay		Seminar essay	0.5	(Other)	
	Tests	1.0	Oral exam	0.5	(Other)	
	Written exam	0.5	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**
	H.D. Belitz, W. Grosch, Schieberle Food Chemistry, 3rd revised Edition, Springer, Berlin, 2004.		1
	B. Šimundić, V. Jakovlić, V. Tadejević, Poznavanje robe: živežne namirnice s osnovama tehnologije i prehrane. Tiskara Rijeka d.d., Rijeka, 1993.		1
	D. Matasović, Poznavanje prehrambene robe, 6. Edition, Školska knjiga, Zagreb, 1999.		1
	S.S. Nielsen (2003) Food analysis laboratory manual, Kluwer Academic/Plenum		1

Optional literature (at the time of submission of study programme proposal)	R. Lawely, L. Curtis, J. Davis, The Food Safety Hazard Guidebook, RSC, 2008. B. Caballero, Encyclopedia of Food Science and Nutrition, Academic Press, 2003. T. Shibamoto, K. Kanazawa, F. Shahidi, C. T. Ho, Functional Food and Health, American Chemical Society, 2008. G. Campbell-Platt, Food Science and Technology, John Wiley & Sons, 2008. Scientific papers selected by the lecturer. Publishers, New YorkS. Ötleş (2005) Methods of Analysis of Food Components and Additives, Taylor & Francis, CRC Press.
Quality assurance methods that ensure the acquisition of exit competences	Quality of the teaching and learning, monitored at the level of the (1) teachers, accepting suggestions of students and colleagues, and (2) faculty, conducting surveys of students on teaching quality.
Other (as the proposer wishes to add)	

Quality Management

NAME OF THE COURSE	Quality Management					
Code	KTK 303	Year of study	3			
Course teacher	Ph.D. Josipa Giljanović, associated professor	Credits (ECTS)	5.0			
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	15%			
COURSE DESCRIPTION						
Course objectives	Acquiring a basic and practical knowledge on principles, methodology, techniques of quollity assurance on food in RH and EU					
Course enrolment requirements and entry competences required for the course	Completing the course: General Biology, Analytical Chemistry, Organic Chemistry, Microbiology of Food					
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	After completing the course, the student will will be able to - Know basics information of international, European and Croatian legislation on food safety, - Understand the theory and practice of quality management of food and implement a quality system - Understand and be able to apply management tools - They shall be ablle to to make case study in feeld of food business, - Knowledge of HACCP, prerequisite programs, documentation - Knowledge of ISO 9000, ISO 22000, IFS, BRC, 17025 and Accreditation System					
Course content broken down in detail by weekly class schedule (syllabus)	First week : Introduction - Food Safety and Food Safety Management Systems: Seminar on Food Safety and Quality Management Systems Second week : International, European and Croatian legislation in the area of food safety; Seminar on Quality Management Systems .3rd week : total quality management, TQM; Seminar: quality tools, PDC cycle .4th week : Food safety, Food safety management systems; Seminar: application of food safety in food industry, 5th week : Prerequisite programs (PRP) documentations, implementation of prerequisite programs; Seminar:, documentations and implementation of prerequisite programs 6th week . traceability and product recall; Seminar: traceability, documentation, product recall 7th week . I partial exam . 8th week: HACCP system, documentation and application; Seminar: HACCP 9th week . HACCP system, documentation and application; Seminar: HACCP. 10th week : Audit, certification, recertification; Seminar: Audit, certification, recertification 11th week : accreditation system; Seminar: accreditation 12 weeks . The basic concept of ISO 9001 and ISO 22000; Seminar: Application of ISO 9001 and ISO 22000 13th week . The basic concept of the BRC and IFS standards; Seminar: application of BRC and IFS standards 14th week autochthonous products, documentation and protection; Seminar: documentation and registration					

<table>
<tr><td></td><td colspan="6">15th week :II partial exam .</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒ lectures
☒ seminars and workshops
☒ exercises
☐on linein entirety
☒ partial e-learning
☐field work</td><td colspan="3">☐independent assignments
☒ multimedia
☐laboratory
☐work with mentor
☐ (other)</td></tr>
<tr><td>Studentresponsibilities</td><td colspan="6">Lectures attendance - at least 80% and completing seminars</td></tr>
<tr><td rowspan="6">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)</td><td>Class attendance</td><td>1</td><td>Research</td><td></td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td></td><td>Report</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td>2</td><td>(Other)</td><td></td></tr>
<tr><td>Tests</td><td>1</td><td>Oral exam</td><td>0,5</td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td>0,5</td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td></td><td colspan="5"></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="6">The entire test can be applied over two partial tests during the semester. Passing threshold is 60%. Each test in assessing participates with 50%. Lectures presence of 80 to 100% is 10% marks. The examination periods there is a written and oral exam. Passing threshold is 60%. Passing one partial test of any part (previous activity) is valid throughout current academic year. Written exam has a share of 50% and oral examination also 50%. Students who have not passed the partial tests will have oral examination in the regular examination period. Passing threshold is 60% and the examination form to participate in the evaluation by 50%.

Rating: 60% -69% - satisfactory, 70% -79% - good, 80% -89% very good, 90% - 100% - excellent.</td></tr>
<tr><td rowspan="5">Required literature (available in the library and via other media)</td><td colspan="3">Title</td><td>Number of copies in the library</td><td colspan="2">Availability via other media</td></tr>
<tr><td colspan="3">1. Zakoni, Pravilnici, Norme (ISO 9000, ISO 17025, ISO 22000; IFS, BRC,)</td><td>1. 6</td><td colspan="2"></td></tr>
<tr><td colspan="3">Nastavni materijali pripremljeni za kolegij, 3. Uputstva za seminar i vježbe (interni materijali);</td><td></td><td colspan="2">KTF web page</td></tr>
<tr><td colspan="3">3. J. Giljanović, Predavanja, interni recenzirani materijal, Split, 2014.g,</td><td></td><td colspan="2">KTF web page</td></tr>
<tr><td colspan="3">. J. Giljanović, Uputstva za vježbe, interni recenzirani materijal, Split, 2014</td><td>1</td><td colspan="2">KTF web page</td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="6">1.Suzanne Nielsen,; Food Analysisi, fourth edition, S.S., Springer Science+Business Media, LLC, New York, NY, USA, 2010.
2. Ceirwyne S. james, Analytical chemistry of food, Aspen publisher, Inc.Gaithesburg, Maryland, 1999;.
3. Official Methods of Analysis of AOAC International, 19th Ed. 2012. Editor: Dr. George W. Latimer, Jr
4.Prijevod: General Principles of Food Hygiene CAC/RCP 1-1969, Rev. 4-2003 2/29, JCodex Alimentarius-Joint FAO/WHO Food Standards, ISO, IDF, IUPAC, ICC - standardi za pojedine vrste namirnica,</td></tr>
<tr><td>Quality assurance methods that</td><td colspan="6">• registration of student's presence in class</td></tr>
</table>

ensure the acquisition of exit competences	• annual analysis of students success in this course • student's survey in order to evaluate the professor • professor's self-evaluation
Other (as the proposer wishes to add)	

Hygiene and Sanitation

NAME OF THE COURSE	Hygiene and Sanitation					
Code	KTK 303	Year of study	I			
Course teacher	Ph.D. Tea Bilusic, Full Professor	Credits (ECTS)	5.0			
Associate teachers		Type of instruction (number of hours)	L	S	E	F
			30	15	15	0
Status of the course	Mandatory	Percentage of application of e-learning				
COURSE DESCRIPTION						
Course objectives	Acquiring a basic knowledge on - distiniquishig and understanding of major food risks - understanding of principles of food hygiene in food industry - controlling of food storage and food distribution in order to enhance of food shelf-life - determination of food contaminants - application of food hygene practice as well as HCCP					
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 hygene and sanitation in food industry, which includes: - to distinquish and recognize major risks characteristic for selected food class - the knowledge on conditions which can cause food deterioration - to apply hygene and sanitation practice in order to keep food safety - to apply HCCP as a method for control the food safery					
Course content broken down in detail by weekly class schedule (syllabus)	**1.** Introduction. Bioterorism, factors affecting climate in relation to food safety. L (1h) **2.** Water safety in food industry. L (2h), S (1h) **3.** Chemical and physical contaminants in foods. L (2h), S (1h) **4.** Microorganims in food and food-borne illnesses. L (1h) **5.** Micotoxins and food alergenes. L (2h), S (1h) **6.** Sources of food contamination. L (2h), S (1h) **7.** Deterioration and hygene measures of plant-derived food: Cereals. L (2h), S (1h) **8.** Deterioration and hygene measures of plant-derived food: Fruits and vegetables. L (2h), S (1h) **9.** Deterioration and hygene measures of animal-derived food: Red meat. L (2h), S (1h) **10.** Deterioration and hygene measures of animal-derived food: Fish. L (2h), S (1h) **11.** Deterioration and hygene measures of animal-derived food: Milk and dairy products. Eggs. L (2h), S (1h) **12.** Good manufacturing practice. L(1h) **13.** HCCP. L (2h), S (1h) **14.** Sanitation. Sanitizers. L (2h), S (1h) **15.** Disinfection. L (2h), L (1h)					

<table>
<tr><td></td><td colspan="6">
16. Dezinsection. L (2h), S (1h)
17. Deratization. L (2h)
18. CIP i COP systems. L (1h)
Laboratory exercises:
- microbiological tests (food, working place, hands) using API biochemcial strips, rapid tests (reasurin solution and methylene blue)
- monitoring of color-changing of meat influenced by different factors (temperature, pH, antioxidants, additives…)
- determination of disinfection rate of cleaning compounds (ethanol, isopropanol, bases)
</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒ lectures
☒ seminars and workshops
□exercises
□on linein entirety
□partial e-learning
□field work</td><td colspan="3">□independent assignments
☒ multimedia
☒ aboratory
□work with mentor
□ (other)</td></tr>
<tr><td>Studentresponsibilities</td><td colspan="6">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</td></tr>
<tr><td rowspan="6">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)</td><td>Class attendance</td><td>1</td><td>Research</td><td></td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td></td><td>Report</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td>0.5</td><td>(Other)</td><td></td></tr>
<tr><td>Tests</td><td>0.5</td><td>Oral exam</td><td>2</td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td></td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td></td><td colspan="5"></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="6">During semester, two written exams are provided (as partical 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.</td></tr>
<tr><td rowspan="4">Required literature (available in the library and via other media)</td><td colspan="3">Title</td><td>Number of copies in the library</td><td colspan="2">Availability via other media</td></tr>
<tr><td colspan="3">V. Turčić. HACCP i higijena namirnica. Filedata, Zagreb, 2000.</td><td>1</td><td colspan="2"></td></tr>
<tr><td colspan="3">R. K. Guthrie. Food Sanitation. Avi, New York, 1988.</td><td>1</td><td colspan="2"></td></tr>
<tr><td colspan="3">N. G. Marriot, R.B. Gravani. Principles of Food Sanitation. Springer, 2006.</td><td>1</td><td colspan="2"></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="6">A Asaj. Zdravstvena dezinskecija u nastambama i okolišu. Medicinska naklada, Zagreb, 1999.
A. Asaj. Deratizacija u praksi. Medicinska naklada. Zagreb, 1999.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="6">• registration of student's presence in class
• annual analysis of students success in this course
• student's survey in order to evaluate the professor
• professor's self-evaluation</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="6"></td></tr>
</table>

Olive Processing Tehnologies

NAME OF THE COURSE	Olive Processing Technologies					
Code	KTK304	Year of study	3.			
Course teacher	PhD, Ivica Ljubenkov,Assitant 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 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)	After passing the exam the student is able to: - Suggest appropriate procedures for planting of olive trees, selection of varieties, fertilization, plant protection, pruning and harvesting, - Demonstrate the basic steps in making olive oil and table olives production, - Independently perform basic tests of olive oil and table olives quality evaluation, - Choose the correct approach in solving the problems with waste materials from olive oil and table olives production, - Know the basic legislation in the field of olive oil and table olives.					
Course content broken down in detail by weekly class schedule (syllabus)	1st week: Historic part - olives and olive oil through the history of the Mediterranean region and in Croatia 2nd week: Olive production - soil preparation, variety selection, fertilization, pruning, protection and irrigation 3rd week: Olive oil production - harvesting, transport, storage, processing methods of olive oil (2 and 3-phase systems), pressing 4th week: Filtering, packaging and storage of olive oil, refined olive oil and olive pomace oil 5th week: Physico-chemical and sensory analysis of olive oils, introduction to the methods of analysis 6th week: Health benefits of olive oil, impact of the individual ingredients 7thweek: Legislation in the field of olive oil 8th week: I Colloquium 9th week: Table olives processing, harvesting, transport, storage, production (preservation) methods, HACCP 10th week: Secondary table olives processing 11th week: Evaluation of the table olives quality, introduction to the physico-chemical and sensory testing methods for table olives 12th week: Microbiology of olives and olive oil 13th week: Legislation in the field of table olives 14th week: Waste materials from the production of olive oil and table olives, types and quantities of waste from the production of olive oil and table olives, its use and recycling methods 15th week: II. Colloquium					

<table>
<tr><td></td><td colspan="6">Practice: Olive analyses (maturity index, the yield of water and oil), Determination of 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 mils.</td></tr>
<tr><td>Format of instruction</td><td colspan="3">x lectures
x seminars and workshops
x exercises
□ on line in entirety
□ partial e-learning
x field work</td><td colspan="3">x independent assignments
x multimedia
x laboratory
□ work with mentor
□ (other)</td></tr>
<tr><td>Student responsibilities</td><td colspan="6">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.</td></tr>
<tr><td rowspan="6">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)</td><td>Class attendance</td><td>3,0</td><td>Research</td><td></td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td>1,0</td><td>Report</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td>1,0</td><td>(Other)</td><td></td></tr>
<tr><td>Tests</td><td></td><td>Oral exam</td><td>0,5</td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td>0,5</td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td colspan="6"></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="6">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)</td></tr>
<tr><td rowspan="8">Required literature (available in the library and via other media)</td><td colspan="3">Title</td><td>Number of copies in the library</td><td colspan="2">Availability via other media</td></tr>
<tr><td colspan="3">D. Boskou, Olive Oil-Chemistry and Technology, AOCS press, Champaign, Illinois, 1996, ISBN 0-935315-73-X.</td><td></td><td colspan="2">1</td></tr>
<tr><td colspan="3">Maslina i maslinovo ulje A-Ž, (Zadro, B. i Perica, S., ur.), Naklada Zadro, Zagreb, 2007, ISBN 978-953-182-075-2.</td><td></td><td colspan="2">1</td></tr>
<tr><td colspan="3">O. Koprivnjak, Djevičansko maslinovo ulje: od masline do stola, MIH, Poreč, 2006, ISBN 953-95365-2-9.</td><td></td><td colspan="2">1</td></tr>
<tr><td colspan="3">B. Škarica i sur., Maslina i maslinovo ulje visoke kakvoće u Hrvatskoj, Mario Bonifačić, Punat, 1996.</td><td></td><td colspan="2">1</td></tr>
<tr><td colspan="3">S. Kailis i D. Harris, Producing Table Olives, Landlink Press, Collingwood, 2007. ISBN: 9780643092037</td><td></td><td colspan="2">1</td></tr>
<tr><td colspan="3">S. Bulimbašić, Proizvodnja maslinovog ulja i konzerviranje masline, Mediteranska poljoprivredna knjiga, 2013</td><td>2</td><td colspan="2"></td></tr>
<tr><td colspan="6"></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="6"></td></tr>
<tr><td>Quality assurance methods that</td><td colspan="6">Quality of the teaching and learning, monitored at the level of the (1) teachers, accepting suggestions of students and colleagues, and (2) faculty, conducting</td></tr>
</table>

ensure the acquisition of exit competences	surveys of students on teaching quality.
Other (as the proposer wishes to add)	

Technology of Grape Products

NAME OF THE COURSE	Technology of Grape Products					
Code	KTK305	Year of study	3.			
Course teacher	PhD, Višnja Katalinić, Full Professor	Credits (ECTS)	6.0			
Associate teachers	Ivana Generalić Mekinić, PhD 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	Enable students to gain basic knowledge on grape production and processing, main grape products and production methods, factors affecting the quality of raw material and final product, as well as respective legal limitations.					
Course enrolment requirements and entry competences required for the course						
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Upon successful completion of this course, student will be able to: - understand the potential of grapes as raw-material and define the main grape products - define the grape structure and most major chemical constituents of grapes and wines - describe table-grapes quality parameters and cold-storage conditions - describe and understand the grape-raisin production process - understand and be familiar with grape juice production and preservation - define main steps of the vinification process and distinguish the red and white wine production process specificities - understand the role of ordinary prefermentation and post-fermentation operations - define and understand the importance of alcohol and malolactic fermentation - define role of sulfur dioxide in wine making as well as legal limitations of its use - understand the importance of disposal and possible reuse of the vinification by-products					
Course content broken down in detail by weekly class schedule (syllabus)	1st week: Introduction; Global trends in grape production and processing; The main and other grape products. 2nd and 3rd week: Grape structure and chemical composition; 4th week: Influence of some factors on grape quality; Grape cultivars (table grapes; wine grapes); 5th week: Post-harvest technology for fresh grapes (table grapes-growing industry, harvesting table grapes, storage, transportation 6th week: Raisins production (row material; harvesting and drying; inspection and storage; processing and quality control); 7th week: Grape juice: production and preservation; 8th week: I Colloquium 9th week: Wine-making technology: production overview (from vineyard to bottle); Classification of wines; Specificities of winemaking processes for white, red and rose wines. 10th week: Wine cellar equipment, organization and sanitation; Grape maturity and harvest; Sugar, potential alcohol, pH and acidity, total phenols and anthocyanins determination 11th week: Fermentation (preparation for fermentation; primary alcohol fermentation; secondary malolactic fermentation); 12th week: Maturation; Blending, fining and stabilization; Filtration and bottling;					

<table>
<tr><td></td><td colspan="6">Protecting the wine (oxidation; microbial spoilage); Significance of some enological processes and operations;
13th week: Recommended analysis (panels); Laws and regulations in wine production; Example of HACCP implementation in wine production process;
14th week: Utilization of winery by-products into high added value products.
15th week: II. Colloquium.

Exercises: Grape analysis (Determination of moisture and dry matter content in grapes, Mechanical properties of grapes); Raisins production; Must analysis (sugars, potential alcohol content, must acidity); Alcoholic fermentation; Vinification and control of its parameters; Wine analysis (ethanol, wine extract, sugars, volatile acidity, sulphur dioxide); Acidity correction; Blending wines; Wine fining; Wine colour analysis; Wine phenolics, Antioxidant activity determination; Wine organoleptic analysis. Field trip- Winery visit</td></tr>
<tr><td>Format of instruction</td><td colspan="3">x lectures
x seminars and workshops
x exercises
□ on line in entirety
□ partial e-learning
x field work</td><td colspan="3">□ independent assignments
x multimedia
x laboratory
□ work with mentor
□ (other)</td></tr>
<tr><td>Student responsibilities</td><td colspan="6">Admission to the lectures and seminars of at least 70% of the times scheduled.
Students are required to attend laboratory practice and field work 100%.</td></tr>
<tr><td rowspan="6">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)</td><td>Class attendance</td><td>2.0</td><td>Research</td><td></td><td>Practical training</td><td>1.3</td></tr>
<tr><td>Experimental work</td><td></td><td>Report</td><td></td><td>Field work</td><td>0.2</td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td>0.5</td><td></td><td></td></tr>
<tr><td>Tests</td><td>2.0</td><td>Oral exam</td><td>(1.0)</td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td>(1.0)</td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="6">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).</td></tr>
<tr><td rowspan="4">Required literature (available in the library and via other media)</td><td colspan="3">Title</td><td>Number of copies in the library</td><td colspan="2">Availability via other media</td></tr>
<tr><td colspan="3">P. Riberau-Gayon et.al. Handbook of enology Vol 1Vol 2; John Wiley&Sons, Ltd., Chichester, 2006.</td><td></td><td colspan="2">Yes</td></tr>
<tr><td colspan="3">R.S. Jackson, Wine Science, Academic Press, New York, 2000.</td><td></td><td colspan="2">Yes</td></tr>
<tr><td colspan="3">J.L. Jackobson, Introduction in wine laboratory practices and procedures, Springer, New York, 2006.</td><td></td><td colspan="2">Yes</td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="6">B.W. Zoecklein, K.C. Fugelsang, B.H. Gump, F.S. Nurs, Wine analysis and production, Kluwer Ac./Plenum Pubishers, New York, 1995.

M.A. Amerine, C.S. Ougs, Methods for analysis of musts and wines, John Wiley&Sons, 2000.

R.P. Vine, Winemaking: Form grape growing to market place, Springer, New York, 2002.

M.A. Amerine; H.W. Berg, R.E. Kunkee, C.S. Ough, V.L. Singleton, A.D. Webb,</td></tr>
</table>

	Technology of winemaking, Avi Publishing Co., Westport, Connecticut, 1980.
Quality assurance methods that ensure the acquisition of exit competences	Quality of the teaching and learning, monitored at the level of the (1) teachers, accepting suggestions of students and colleagues, and (2) faculty, conducting surveys of students on teaching quality.
Other (as the proposer wishes to add)	

Fruit and Vegetable Processing

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="6">Fruit and Vegetable Processing</td></tr>
<tr><td>Code</td><td>KTK 306</td><td>Year of study</td><td colspan="5">I</td></tr>
<tr><td>Course teacher</td><td>Ph.D. Tea Bilusic, Full Professor</td><td>Credits (ECTS)</td><td colspan="5">6.0</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Daniela Skroza, Assistant</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>F</td></tr>
<tr><td>30</td><td>15</td><td>25</td><td>5</td></tr>
<tr><td>Status of the course</td><td>Elective</td><td>Percentage of application of e-learning</td><td colspan="5"></td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">Acquiring a basic knowledge on

- fruit and vegetable storing and distribution process (control of fruit respiration, maturation, control of fruits quality during distribution)
- fruit processing (fruit juices, pectin-based products, dried fruits…)
- vegetable processing (canned vegetables, dried vegetables, fermented vegetables…)</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6"></td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">After completing the course, the student will become familiarized with the major concepts of fruit and vegetables processing, which includes:
- the understanding of biochemical and physiological changes in fruit after maturation process
- the knoweldge on nutritive and healthy aspects of fresh fruits and vegetables and their products
- the understanding of the influence of paramteres related to fruit shelf-life and quality during storage
- the understanding of factors influencing the change of nutritive value and chemical composition of fruit during processing
- the knowledge on control systems for food safety in fruit and vegetables processing</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="6">1. Fruit and vegetables classification. Healthy and nutritive aspects of fruit and vegetables.
2. The influence of maturation process on chemical composition and nutritive value of fruit.
3. Biologically active compounds from fruit and vegetables and their role in fruit and vegetable processing.
4. Microbiology of fresh and stored fruit and vegetable.
5. Physico-chemical changes in fruit during storage.
6. Post-harvest technology of fruit and vegetable.
7. Thermic treatments in fruit and vegetable processing.
8. Enhancement of nutritive value of fruits and vegetables after thermic treatments.
9. Fruits and vegetables juices processing.
10. Pectin-based products.
11. Canned and fermented vegetables.
12. Dried fruits and vegetables.</td></tr>
</table>

<table>
<tr><td></td><td colspan="6">13. Minimally processed fruits and vegetables.
14. Novel technologies in fruits and vegetables processing: vacuum technology, edible coating films, the use of high pressure, new modified atmosphere technology, the use of bioctechnology in fruits and vegetables processing.
15. Fruits and vegetables and their products characteristic for Dalmatian region.
<u>Laboratory exercises:</u>
- Determination of physical and chemical parameteres, 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 maturarion 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</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒ lectures
☒ seminars and workshops
□exercises
□on line in entirety
□partial e-learning
□field work</td><td colspan="3">□independent assignments
☒ multimedia
☒ laboratory
□work with mentor
□ (other)</td></tr>
<tr><td>Studentresponsibilities</td><td colspan="6">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</td></tr>
<tr><td rowspan="6">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)</td><td>Class attendance</td><td>1</td><td>Research</td><td></td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td></td><td>Report</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td>0.5</td><td>(Other)</td><td></td></tr>
<tr><td>Tests</td><td>0.5</td><td>Oral exam</td><td>2</td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td></td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td colspan="6"></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="6">During semester, two written exams are provided (as partical 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.</td></tr>
<tr><td rowspan="2">Required literature (available in the library and via other media)</td><td colspan="3">Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td colspan="3">L. De la Rosa, E. Alvarez-Parilla, G. Gonzalez-Aguilar: Fruit and Vegetable Phytochemicals, Wiley-Blackwell, 2010</td><td></td><td>x</td></tr>
</table>

	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 Vetegable Processing, Blackwell, 2005		
	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; W.V. Cruess: Laboratory Manual of Fruit and Vegetable Products, General Book, 2010.		
Quality assurance methods that ensure the acquisition of exit competences	• registration of student's presence in class • annual analysis of students success in this course • student's survey in order to evaluate the professor • professor's self-evaluation		
Other (as the proposer wishes to add)			

Seafood Processing Technology

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="6">Seafood Processing Technology</td></tr>
<tr><td>Code</td><td>KTK307</td><td>Year of study</td><td colspan="5">3.</td></tr>
<tr><td>Course teacher</td><td>PhD, Vida Šimat, Assistant Professor</td><td>Credits (ECTS)</td><td colspan="5">6.0</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2"></td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>F</td></tr>
<tr><td>30</td><td>15</td><td>20</td><td>10</td></tr>
<tr><td>Status of the course</td><td>Mandatory</td><td>Percentage of application of e-learning</td><td colspan="5"></td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">The main objective of this course is to enable students to understand and implement the proper ways of handling fish and fishery products from catch to the table and selecting suitable methods of conservation and implementation of good manufacturing practices during various processes of conservation of fishery products.</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">Competence in applying knowledge of inorganic and organic chemistry and biochemistry and basic microbiology.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">After passing the exam the student is able to:
- Recognize all phases of post-mortal changes in fish;
-Identify and detect most metabolites resulting from the activity of specific spoilage microorganisms;
- Implement different methods of conservation of fishery products in accordance with good manufacturing practice;
-Define and carry out quality assessment of raw materials, technological processes and final products in fish processing industry.
- Calculate the norms/yields required for the organization of production in the fish processing industry
- Identify and eliminate problems during technological processing of fishery products
- Identify the critical control points in a production process; carry out hazard analysis, preventive and corrective measures to ensure seafood safety
- Independently implement the HACCP system.</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="6">1st week: Introductory lecture, status and trends in fisheries, Structure and nutritive composition of fish
2nd week: Post-mortem changes in fish (2 hours)
3rd week: Ice in fisheries
4th week: Handling catch of a fishing vessel, methods of transportation and preparation of raw materials for processing
5th week: Colloquium 1
6th week: Preservation of fish by low temperatures
7th week: Preservation of fish by high temperature
8th week: Sterilization: production of canned fish
9th week: Preservation of fish by salting, Preservation of fish by marinating
10th week: Preservation of fish by smoking and drying
11th week: Preservation of fish eggs, invertebrates and algae
12th week: Packaging materials and methods in seafood industry
13th week: Colloquium 2
14th week: Production control, quality management and traceability in the fish processing industry
15th week: Examples of the implementation of HACCP system in the fish processing industry, legislation.

Exercises: Calculation of norms/yields in production, Receiving and control of raw</td></tr>
</table>

<table>
<tr><td></td><td colspan="6">materials, introduction to quality assessment methods for fish and crustaceans, The sensory evaluation of fish, Histamine, the role of histamine in human poisoning; comparison of methods for the detection and quantification of histamine, Measuring the pH value, dielectric properties and texture of different types of fish during different storage conditions, Quality assessment of various RTE seafood products, Implementation of HACCP.

Field exercises: Visiting fish processing factory Conex - trade doo., Exercise in the laboratory: Control the shutter, hermeticity and suitability of cans during production, Visiting fish processing factory Sardina doo. Postira, Brač, Visiting Smokehouse Bek, Kaštela.

Seminars: Through seminars, each student independently conducts technological process for a specific product, and with the teacher and other students discusses the selected procedures in production, choice of packaging materials and packaging methods and key points in the production process. Students are required to be prepared for discussion at the seminars. The teacher evaluates student's participation in the seminar (demonstrated knowledge, understanding, ability to define problems, reasoning, activity in the discussion, etc.).</td></tr>
<tr><td>Format of instruction</td><td colspan="3">× lectures
□ seminars and workshops
× exercises
□ on line in entirety
□ partial e-learning
× field work</td><td colspan="3">× independent assignments
× multimedia
× laboratory
□ work with mentor
□ (other)</td></tr>
<tr><td>Students responsibilities</td><td colspan="6">Students are required to attend classes (lectures and exercises), to actively participate in the teaching process and pass the exam (colloquiums). The presence in the classroom will be recorded (lectures and exercises). A student is allowed one unexcused absence from exercises and two absences from lectures. Field exercises are obligatory. The omission is justified in the case of certain activities at the University for which it is necessary to have a written confirmation. Delay in classes (lectures and exercises) will also be recorded; three delays will be counted as one unexcused absence. 100% presence in the class will be rewarded with two points at the colloquium.</td></tr>
<tr><td rowspan="6">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)</td><td>Class attendance</td><td>1</td><td>Research</td><td></td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td></td><td>Report</td><td></td><td>Field exercises</td><td>1</td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td>2</td><td>(Other)</td><td></td></tr>
<tr><td>Tests</td><td>2</td><td>Oral exam</td><td>(1)</td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td>(1)</td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td></td><td colspan="5"></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="6">Continuous evaluation through two colloquium during semester :
Attendance of lectures, A_1 (success = 80 -100 %), proportion of grade, $k_1 = 0.1$
Laboratory and field exercises, A_2 (success = 60 -100 %), proportion of total grade, $k_2 = 0.15$
Seminar essay + presentation, A_3 (success = 60 -100 %), proportion of total grade, $k_3 = 0.15$
1st colloquium , A_4 (success = 60 -100 %), proportion of total grade, $k_4 = 0.30$
2nd colloquium, A_5 (success = 60 -100 %), proportion of total grade, $k_5 = 0.30$

Grades (%) = $0.10A_1+0.15\ A_2 + 0.15\ A_3+ 0.30\ A_4+ 0.30\ A_5$

FINAL EVALUATION through a comprehensive written and oral exam will be conducted in regular exam period through four test dates:
Activities A_1, A_2 and A_3 are measured in the same manner as above .
The written exam, A_6 (success = 60 -100 %), proportion of total grade, $k_6 = 0.20$</td></tr>
</table>

<table>
<tr><td></td><td colspan="3">Oral examination, A_7 (success = 60 -100 %), proportion of total grade, K_7 = 0.40

RATING (%) = 0.10 A_1+0.15 A_2 + 0.15 A_3+ 0.20 A_6+ 0.40 A_7

Grades (%): 50 -64 % - successful (2) 65-75 % - good (3), 76-89 % - very good (4), 89-100 % - Excellent (5) .

Previous activity (one passed colloquium) is valid during regular examination periods for that academic year as part of the written exam.</td></tr>
<tr><td rowspan="6">Required literature (available in the library and via other media)</td><td>Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td>Šoša, B. (1989). Higijena i tehnologija prerade morske ribe, ŠK, Zagreb.</td><td></td><td>Teacher</td></tr>
<tr><td>Sikorski, Z.E. (1990). Seafood: resources, nutritional composition and preservation, CRC Press, Inc. Boca Raton, Florida, SAD.</td><td></td><td>Teacher</td></tr>
<tr><td>Borresen, T., 2008. Improving seafood products for the consumer, Woodhead Publishing Ltd., Cambridge, England.</td><td></td><td>Teacher</td></tr>
<tr><td>Rehbein, H., Oehlenschlager, J.(2009). Fishery Products: Quality, safety and authenticity. Wiley-Blackwell, UK.</td><td></td><td>Teacher</td></tr>
<tr><td>Bremner, H.A., (2002). Safety and qualtiy issues in Fish Processing, CRC Press, Inc. Boca Raton, Florida, SAD.</td><td></td><td>Teacher</td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="3">Luten, J.B., Borresen, T., Oehlenschlager, J. (1997). Seafood from producer to consumer. Integrated approach to quality. Elsevier, Amsterdam.
Huss, H.H. (1988). Fresh fish- quality and quality changes, Training Programme on Fish Technology and Quality Control, FAO Fisheries Series, FAO, Rome, str. 132.
Huss, H.H. (1994) Assurance of Seafood Quality. FAO Fisheries Technical Paper No. 334., FAO, Rome, Italy, str. 177.
Huss, H.H. (1995) Quality and quality changes in fresh fish. FAO Fisheries Technical Paper No. 348., FAO, Rome, Italy, str . 203.
Current Legislation</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="3">Student surveys organized at University level</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="3"></td></tr>
</table>

Milk and Dairy Products Technology

NAME OF THE COURSE	Milk and Dairy Technology					
Code	KTK 308	Year of study	I			
Course teacher	Ph.D. Tea Bilusic, Full Professor	Credits (ECTS)	6.0			
Associate teachers	Daniela Skroza, assistant	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 - The chemical composition, nutritive and healthy value of milk and dairy products - Milk and dairy products processing - the control of milk and dairy products safety during and after processing - the work of control laboratory (control of chemical composition, sensory evaluation, microbiological tests) - cheese production (processing control and quality control)
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 milk and dairy products technology, which includes: - to determine the chemical compostion and sensory value of milk and dairy products - to recognize risks factors for milk and dairy products safety - to apply the knowledge on milk and dairy products processing (yogurth, cheese, fermented milk) - to apply the knowledge on beneficial microorganisms important in milk and dairy technology in production of fermented products - to define the nutritive and healthy importance of milk and dairy products in daily diet
Course content broken down in detail by weekly class schedule (syllabus)	1. Introduction. Types of milk. L (1h) 2. Chemical composition of milk: milk fat. L (1h), S (1h) 3. Chemical composition of milk: lactose; proteins in milk. L (2h), S (2h) 4. Chemical composition of milk: enzymes, vitamins, minerals. L (2h) 5. Nutritive value of milk. L (1h), S (1h) 6. Sensory evaluation of milk and dairy products. L (1h) 7. Primary and secondary microorganisms in milk. Types of fermentation proces sin milk and dairy prodcts. L (2h), S (1h) 8. Processing milk. The use of high temperature in milk processing. P (2h), S (1h) 9. The use of membrane separation techniques in milk products. L (1h), S (1h) 10. Fermented dairy products clasiffication. (L1h), S (1h) 11. The role of probiotics in processing of fermented dairy products. L (1h), S (1h) 12. Nutritive and health effects of fermented dairy products. L (2h), S (1h) 13. Introduction to cheese industry. Cheese classification. L (2h), S (1h)

	14. Basic knowledge on cheese processing. L (2h) 15. Cogulation process in cheese processing. L (2h) 16. The role of maturation process in cheese production. L (2h), S (1h) 17. Butter processing. Ice-cream processing. L (2h), S (1h) Laboratory exercises: - sensory evaluation of milk and dairy products (pasteurized and sterilized milk, fermented milk, yogurts, cheeses) - microbiological tests (resazurin test, test using methylene blue, rapid cooking test, MILKBACT tests) - determination of physical and chemical parameteres in milk: density, water content, ash, lactose, protein, fat - test for pasteurization control (phosphatase test) - test for antibiotics in milk - casein isolation - preparation of casein and albumin types of cheeses - preparation of yogurt
Format of instruction	☒ lectures ☒ seminars and workshops □exercises □*on line*in entirety □partial e-learning □field work □independent assignments ☒ multimedia ☒ laboratory □work with mentor □ (other)
Studentresponsibilities	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 eachactivity 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 partical 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**
	Lj. Tratnik. Mlijeko-tehnologija, biokemija i mikrobiologija. Hrvatska mljekarska udruga. Zagreb, 1998.	3	
	R. Božanić, I. Jeličić, T. Bilušić. Analiza mlijeka i mliječnih proizvoda. Priručnik Sveučilišta u Zagrebu, Plejada, 2012.	1	
	J. Havranek, V. Rupić, S. Golc-Teger. Mlijeko: od farme do mljekare. Hrvatska mljekarska udruga, Zagreb, 2003.	1	

Optional literature (at the time of submission of study programme proposal)	E. Spreer. Milk and Dairy Products Technology, CRC Press, 1998. Y.W. Park. Bioactive Components in Milk and Dairy Products. Wiley Blackwell, 2009.
Quality assurance methods that ensure the acquisition of exit competences	• registration of student's presence in class • annual analysis of students success in this course • student's survey in order to evaluate the professor • professor's self-evaluation
Other (as the proposer wishes to add)	

Processing Technology of Herbs and Spices

NAME OF THE COURSE	Processing Technology of Herbs and Spices					
Code	KTK309	Year of study	3.			
Course teacher	PhD, Igor Jerković, Full Professor PhD, Višnja Katalinić, 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	By the end of the course, 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)	After passing the exam students will be able to: - describe basic terms, types of species and medicinal herbs, preparation of extracts and their useful application - demonstrate basic procedures of processing species and medicinal plants and extraction methods - determine appropriate analysis methods of the obtained extracts or plant materials and methods of determination of antioxidant and antibacterial properties - 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 - 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					
Course content broken down in detail by weekly class schedule (syllabus)	1st week: Introduction, history and use of medicinal herbs; Definition of medicinal herbs and aromatic plants 2nd week: taxonomy, nomenclature and classification; Distribution in Croatia and abroad; wild and cultivated plants; potential of the Mediterranean climate. 3rd and 4th week: Selected species of medicinal plants and herbs and their importance in the food industry, representatives of some major plant families (legumes, daisies, cloves, roses, anemones, lilies, wheat or grass, meadow grass). 5th and 6th week: Production steps: Select and Collection/Harvesting (seeds, leaves, roots), Transportation, Quality of raw material (the determination of pesticides, mycotoxins, microbiological...); 7th week: Mulching; Drying (chamber and tunnel dryers, microwave drying, spray freeze and reverse osmosis), cleaning, packaging and labeling products;					

<table>
<tr><td></td><td colspan="6">Preservation.
8th week: I. colloquium
9th week: Herbal preparations (liquid and dry extracts), liquid extract (the degree of fragmentation, extraction tool, extraction);
10th week: First group of extraction methods (maceration, bimaceration, digestion, infusion, decoction, turboextraction, ultrasonic extraction);
11th week: Second group of methods of extraction (percolation, repercolation, diacolation, evacolation).
12th and 13th week: Active and effective substances, antioxidant and antimicrobial properties of biologically active compounds from herbs and aromatic plants, analysis of plant material; Factors affecting the quality of active ingredients.
14th week: The most important products, teas and tea blends, spice powders, spice extracts and concentrates, legal restrictions.
15th week: II. colloquium
Exercises:
The quality analysis of raw materials and finished products; Herbal preparations using different extraction procedures, testing the influence of extraction parameters on the composition and properties of herbal preparations (degree of fragmentation of plant material, extraction solvent, duration, temperature, stirring, ultrasound); Determination of major components in herbal preparations by spectrophotometric and chromatographic methods, testing the biological activity of herbal preparations (antioxidant and/or antimicrobial properties); Application of herbal products in the selected food products.</td></tr>
<tr><td>Format of instruction</td><td colspan="3">x lectures
x seminars and workshops
x exercises
□ on line in entirety
□ partial e-learning
□ field work</td><td colspan="3">x independent assignments
x multimedia
x laboratory
□ work with mentor
□ (other)</td></tr>
<tr><td>Student responsibilities</td><td colspan="6">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.</td></tr>
<tr><td rowspan="5">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)</td><td>Class attendance</td><td>1.5</td><td>Research</td><td>0</td><td>Practical training</td><td>1.0</td></tr>
<tr><td>Experimental work</td><td>1.0</td><td>Report</td><td>0</td><td>(Other)</td><td></td></tr>
<tr><td>Essay</td><td>0</td><td>Seminar essay</td><td>0.5</td><td>(Other)</td><td></td></tr>
<tr><td>Tests</td><td>0</td><td>Oral exam</td><td>0</td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td>2.0</td><td>Project</td><td>0</td><td>(Other)</td><td></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="6">The course content is divided into two units that students take over partial exams or joining final exam. The exam is considered passed if students achieve at least 60% (60-70% successful (2), 70-80% good (3), 80-90% very good (4), 90-100% excellent (5))
The final grade is based on the evaluation of:
Presence and activities on lectures and seminars: 5%
Laboratory exercises: 10%
First partial exam: 43%
Second partial exam: 42%</td></tr>
<tr><td>Required literature (available in the library and via other</td><td colspan="3">Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
</table>

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	Yes
	K.T. Galle, Hrvatsko ljekovito bilje, Mozaik knjiga, Zagreb, 2001.	1	Yes
	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 of the teaching and learning, monitored at the level of the (1) teachers, accepting suggestions of students and colleagues, and (2) faculty, conducting surveys of students on teaching quality.		
Other (as the proposer wishes to add)			

Methods of Food Analysis

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="6">Methods of Food Analysis</td></tr>
<tr><td>Code</td><td>KTK 324</td><td>Year of study</td><td colspan="5">3</td></tr>
<tr><td>Course teacher</td><td>Ph.D. Josipa Giljanović, associated professor</td><td>Credits (ECTS)</td><td colspan="5">4.0</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2"></td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>F</td></tr>
<tr><td>30</td><td>0</td><td>30</td><td>0</td></tr>
<tr><td>Status of the course</td><td>Elective</td><td>Percentage of application of e-learning</td><td colspan="5"></td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">Acquiring a basic and practical knowledge on principles, methodology, techniques of food analysis in RH and EU</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">Completing the course: General Biology, Analytical Chemistry, Organic Chemistry, Microbiology of Food</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">After completing the course, the student will will be able to
- define and used a method that will determine some basic ingredient in food
- Define and plan the chosen method,
- Assemble or construct apparatus and practically implement the method,
- Be able to calculate and interpret the result
- Compare the method with similar methods and adequately evaluated
- Assess whether it is suitable for other purposes, and recommend for
- Draw conclusions from the chosen method.
- Write an analytical report</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="6">First week : description and view the contents . Definitions , Introduction to Food Analysis . Croatian and international regulations . standards
Second week : Evaluation of analytical data , the analytical report .
3rd week : Sampling and sample preparation .
4th week : Determination of basic food ingredients : water , methods of wather determination in food
5th week : ash , minerals , determination of ash and minerals contents
6th week . proteine and amino acid, determination of proteine and amino acid
7th week . I partial exam .
8th week . Fats ; determination of fats, method ,
9th week . sugars , methods of determination .
10th week : vitamins methods of determination.
11th week : Principles and application of selected analytical techniques : separation methods in food analysis ,
12 weeks . Principles and applications of optical methods in food analysis
13th week . Principles and application of electroanalytical methods in food analysis
14th week . Principles and application of sensory methods in food analysis
Laboratory:I I partial exam .
Determination of water.; Determination of ash and mineral; Determination of nitrogen; Determination of fat, Determination of carbohydrates, Determination of vitamins, UV / VIS spectroscopy, AAS, IR spectroscopy, potentiometry,</td></tr>
</table>

<table>
<tr><td></td><td colspan="6"></td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒ lectures
☒ seminars and workshops
☒ exercises
☐on linein entirety
☐partial e-learning
☐field work</td><td colspan="3">☐independent assignments
☒ multimedia
☒ laboratory
☐work with mentor
☐ (other)</td></tr>
<tr><td>Studentresponsibilities</td><td colspan="6">Lectures attendance - at least 80% and completing exercises</td></tr>
<tr><td rowspan="6">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)</td><td>Class attendance</td><td>1</td><td>Research</td><td></td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td>1</td><td>Report</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Tests</td><td>1</td><td>Oral exam</td><td>0.5</td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td>0.5</td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td colspan="6"></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="6">The entire test can be applied over two partial tests during the semester. Passing threshold is 60%. Each test in assessing participates with 50%. Lectures presence of 80 to 100% is 10% marks. The examination periods there is a written and oral exam. Passing threshold is 60%. Passing one partial test of any part (previous activity) is valid throughout current academic year. Written exam has a share of 50% and oral examination also 50%. Students who have not passed the partial tests will have oral examination in the regular examination period. Passing threshold is 60% and the examination form to participate in the evaluation by 50%. Rating: 60% -69% - satisfactory, 70% -79% - good, 80% -89% very good, 90% -100% - excellent.</td></tr>
<tr><td rowspan="5">Required literature (available in the library and via other media)</td><td colspan="3">Title</td><td>Number of copies in the library</td><td colspan="2">Availability via other media</td></tr>
<tr><td colspan="3">Pravilnici o metodama uzimanja uzoraka i metodama obavljanja kemijskih i fizikalnih analiza različitih prehrambenih proizvoda</td><td>1. 6</td><td colspan="2"></td></tr>
<tr><td colspan="3">. D. A. Skoog, D. M. West i F. J. Holler, Osnove analitičke kemije, Školska knjiga, Zagreb, 1999</td><td></td><td colspan="2"></td></tr>
<tr><td colspan="3">3. J. Giljanović, Predavanja, interni recenzirani materijal, Split, 2014.g,</td><td></td><td colspan="2">KTF web page</td></tr>
<tr><td colspan="3">. J. Giljanović, Uputstva za vježbe, interni recenzirani materijal, Split, 2014</td><td>1</td><td colspan="2">KTF web page</td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="6">1.Suzanne Nielsen,; Food Analysisi, fourth edition, S.S., Springer Science+Business Media, LLC, New York, NY, USA, 2010.
2. Ceirwyne S. james, Analytical chemistry of food, Aspen publisher, Inc.Gaithesburg, Maryland, 1999;.
3. Official Methods of Analysis of AOAC International, 19th Ed. 2012. Editor: Dr. George W. Latimer, Jr
4.Prijevod: General Principles of Food Hygiene CAC/RCP 1-1969, Rev. 4-2003 2/29, JCodex Alimentarius-Joint FAO/WHO Food Standards, ISO, IDF, IUPAC, ICC - standardi za pojedine vrste namirnica,</td></tr>
<tr><td>Quality assurance methods that ensure the</td><td colspan="6">• registration of student's presence in class
• annual analysis of students success in this course</td></tr>
</table>

acquisition of exit competences	• student's survey in order to evaluate the professor • professor's self-evaluation
Other (as the proposer wishes to add)	

Basic Bioctehnology

NAME OF THE COURSE	Basic Biotechnology					
Code	KTK311	Year of study	3.			
Course teacher	Branka Andričić	Credits (ECTS)	3.0			
Associate teachers		Type of instruction (number of hours)	L	S	E	F
			30			
Status of the course	Mandatory	Percentage of application of e-learning				

COURSE DESCRIPTION	
Course objectives	Gaining of basic theoretical knowledge in biotechnology as well as the role and application of microorganisms and enzymes in different areas.
Course enrolment requirements and entry competences required for the course	Biochemistry - enrolled.
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	- definition of term biotechnology - differentiate the primary and secondary cell metabolism and its application in biotechnology - explain of microbe cell growth diagram - explain the advantages of isolated enzymes in biotechnology - describe of basic bioreactor design - describe the basic methods of intracellular products isolation - outline some examples of biotechnological processes.
Course content broken down in detail by weekly class schedule (syllabus)	1st week: Description and overview of the course. Definitions of biotechnology, interdisciplinary of the field, history development, application areas. 2nd week: Perception of biotechnology in society. Metabolism and control of metabolic processes; primary and secondary metabolism, substrates. 3rd week: Anaerobic and aerobic metabolism. Microorganisms in biotechnology (bacterial, fungi (yeasts and moulds). Microbial growth kinetics. Determination of specific growth rate and Monod constant. 4th week: Enzyme technology (enzyme characteristics as the biocatalysts, advantages and disadvantages compared to whole cells). Enzyme kinetics. 5th week: Enzyme sources. Selection, production and immobilization of enzymes. 6th week: Biocatalysts in non-conventional processes. Bioreactors, photo-bioreactors, design. 7th week: Oxygen transfer and oxygen concentration determination. Heat transfer in bioreactor. An overview of the previous lecture for the test. First test. 8th week: Extracellular, periplasmic and extracellular products of metabolism. Down-stream processing: separation solid-liquid, isolation of intracellular products. 9th week: Concentration and purification of products from bioreactor. Purification process control. 10th week: Process economy: cost estimation and an example of process design. An overview of biotechnological processes – basic scheme of biotechnological process. 11th week: Alcohol fermentation and its application in industry. 12th week: Lactic acid fermentation and its application in industry. Anaerobic biomass fermentation. 13th week: Biotechnology in pharmacy. Bacterial polymers. 14th week: Biotechnology in environmental protection and waste water treatment. Biosensors. 15th week: An overview of the previous lecture for the test. Second test.

<table>
<tr><td>Format of instruction</td><td colspan="3">x lectures
□ seminars and workshops
□ exercises
□ on line in entirety
□ partial e-learning
□ field work</td><td colspan="3">□ independent assignments
x multimedia
□ laboratory
□ work with mentor
□ (other)</td></tr>
<tr><td>Student responsibilities</td><td colspan="6"></td></tr>
<tr><td rowspan="5">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)</td><td>Class attendance</td><td>1.0</td><td>Research</td><td></td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td></td><td>Report</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Tests</td><td>0.8</td><td>Oral exam</td><td>0.6</td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td>0.6</td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="6">The complete exam can be passed through two tests during semester. The passing score is 60 % and the fraction of each test is 45%. Attendance on lectures (80-100%) is further 10% of final grade. In the exam period the student has to attend to written and oral exam (passing score is 60%). Previous activity (one passed test) is valid in summer exam period with fraction of 10%. Written exam is 40% and oral exam is 50%. Students without any successful previous activity attend to written and oral exam (passing score is 60%) both with fraction of 50%.
Grades: successful (60% – 70%), good (71% – 80%), very good (81% – 90%), excellent (91% – 100%).</td></tr>
<tr><td rowspan="2">Required literature (available in the library and via other media)</td><td colspan="3">Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td colspan="3">C. Ratlege, B. Kristiansen, Eds. Basic Biotechnology, Cambridge University Press, Cambridge, 2006.</td><td>1</td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="6">J.E. Smith, Biotechnology, Cambridge University Press, Cambridge, 2000.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="6">Quality of the teaching and learning, monitored at the level of the (1) teachers, accepting suggestions of students and colleagues, and (2) faculty, conducting surveys of students on teaching quality.</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="6"></td></tr>
</table>

Food Packaging

NAME OF THE COURSE	Food Packaging					
Code	KTK312	Year of study	3.			
Course teacher	PhD, Nataša Stipanelov, Vrandečić, Associate Professor	Credits (ECTS)	4.0			
Associate teachers		Type of instruction (number of hours)	L	S	E	F
			30		15	
Status of the course	Mandatory	Percentage of application of e-learning	-			
COURSE DESCRIPTION						
Course objectives	To provide an understanding of basic functions 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: - define the main functions of packaging - identify the characteristics of different kind of food and its sensitivity on external influences - describe and identify various packaging materials for food - describe the manufacturing of packaging - identify the interactions in food - packaging system - design packaging solution - perform analysis of packaging materials in laboratory and interpret collected data - participate in team work and to present seminar essay					
Course content broken down in detail by weekly class schedule (syllabus)	1st week: Introduction. 2nd week: Classification of packaging 3rd week: Functions of packaging 4th week: Types and characteristics of foodstuff 5th week: Packaging materials: wood; paper; paperboard; metals 6th week: Polymeric materials: characteristics and classification; cellulose materials, polyethylene, polypropylene, vinyl polymers 7th week: Polystyrene, polyesters, polyamides, polyurethanes; biodegradable polymeric materials 8th week: Manufacturing of polymer packaging. 9th week: Multilayer packaging materials. Glass. First test. 10th week: Packaging forms 11th week: Interactions between food and packaging materials. Packaging for cereals, bakery and confectionery goods 12th week: Packaging for fruits and vegetables; meat and fish; 13th week: Packaging for milk and diary products, alcoholic and soft beverages 14th week: Packaging waste and environment 15th week: Presentation of students seminar essays Second test. *Laboratory exercises*: Analysis of packaging material dimensions; Analysis of paper; Analysis of metal packaging materials; Analysis of polymeric packaging materials; Analysis of multilayer packaging materials					
Format of	**x** lectures		**x** independent assignments			

<table>
<tr><td>instruction</td><td colspan="6">□ seminars and workshops
x exercises
□ on line in entirety
□ partial e-learning
□ field work</td><td colspan="2">x multimedia
x laboratory
□ work with mentor
□ (other)</td></tr>
<tr><td>Student responsibilities</td><td colspan="8">Lecture attendance: 80 %. Laboratory exercises attendance: 100 %. The preparation and presentation of seminar essay (team work)</td></tr>
<tr><td rowspan="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)</td><td>Class attendance</td><td>1.0</td><td>Research</td><td></td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td>0.68</td><td>Report</td><td></td><td>Exercises tests study (Other)</td><td></td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td>1.00</td><td>Field work (Other)</td><td>0.5</td></tr>
<tr><td>Tests</td><td>1.32</td><td>Oral exam</td><td>(0.76)</td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td>(0.76)</td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="8">CONTINUOUS EVALUATION
The complete exam can be passed through two partial tests during semester.
Attendance on lectures, A_1(successfulness =70 -100 %), share in grade, k_1 =0,1
Laboratory exercises, A_2(successfulness =50 -100 %), share in grade, k_2 =0,15
Seminar essay +presentation , A_3(successfulness =50 -100 %), share in grade, k_3 =0,15
1st test, A_4 (successfulness =60 -100 %), share in grade, k_4 =0,30
2nd test, A_5 (successfulness =60 -100 %), share in grade, k_5 =0,30

GRADE (%) = $0,10A_1+0,15A_2 + 0,15A_3+ 0,30A_4 + 0,30A_5$

FINAL EVALUATION
Students who did not take or pass partial tests have to attend to written and oral exam in the regular exam periods.
Activities A1, A2 and A3 are evaluated in the same way as indicated above.
Written exam, A_6 (successfulness =60 -100 %), share in grade, k_6 =0,20
Oral exam, A_7 (successfulness =60 -100 %), share in grade, k_7 =0,40
GRADE (%) = $0,10A_1+0,15A_2 + 0,15A_3+ 0,20A_6 + 0,40A_7$

FINAL GRADE: successful (50% – 61 %), good (62% – 74 %), very good (75% – 87 %), excellent (88% – 100 %).

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.</td></tr>
<tr><td rowspan="3">Required literature (available in the library and via other media)</td><td colspan="5">Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td colspan="5">N. Stipanelov Vrandečić: Ambalaža, Kemijsko-tehnološki fakultet, Split, 2010.</td><td>1</td><td>Web site of institution</td></tr>
<tr><td colspan="5">I. Vuković, K. Galić i M. Vereš: Ambalaža za pakiranje namirnica, Tectus, Zagreb, 2007.</td><td>1</td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="8">Pravilnik o ambalaži i ambalažnom otpadu (NN/2005)
Pravilnik o zdravstvenoj ispravnosti materijala i predmeta koji dolaze u neposredni dodir s hranom (NN/2008)
Z. Janović: Polimerizacije i polimeri, Hrvatsko društvo kemijskih inženjera i tehnologa , Zagreb, 1997</td></tr>
<tr><td>Quality assurance methods that ensure the</td><td colspan="8">Quality of the teaching and learning, monitored at the level of the (1) teachers, accepting suggestions of students and colleagues, and (2) faculty, conducting surveys of students on teaching quality.</td></tr>
</table>

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

Water Technology

NAME OF THE COURSE	Water Technology					
Code	KTK313	Year of study	3rd			
Course teacher	PhD, Marina Trgo, Associate Professor	Credits (ECTS)	6.0			
Associate teachers		Type of instruction (number of hours)	L	S	E	F
			26	15	30	4
Status of the course	Mandatory	Percentage of application of e-learning				

COURSE DESCRIPTION	
Course objectives	Students will introduce to procedures for the preparation of water used in the food industry, as well as associated wastewater treatment processes.
Course enrolment requirements and entry competences required for the course	Passed exam in subject Analytical chemistry.
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	After passing the exam the student is expected to know: - Explain the processes for the preparation of drinking water used in the food industry - Water quality requirements for different types of food industry - Procedures for softening water - Methods of test facilities biodegradable substances in water - Conventional methods of wastewater treatment - Advanced methods of wastewater treatment - Basic regulations relating to water quality in the nature and maximum permissible concentrations of harmful substances in wastewater prior to discharge into the environment.
Course content broken down in detail by weekly class schedule (syllabus)	1st week: Hydrology. The water cycle, evaporation, infiltration, precipitation, underground and surface runoff. Condition of natural waters in Croatia. The division of water in nature. 2nd week: The water quality in Croatia, well-developed system of water supply and drainage. Preparation of drinking water. The use of water in the chemical and food industry. 3rd week: Physical and chemical properties of water. Indicators of water quality. Technological processes of water treatment. Filtration, membrane processes. Seminar: Evaluation of water quality in the nature on the basis of chemical composition. 4th week: The application of membrane processes in the industry. Desalination. Adsorption. Adsorbents in water treatment technology. Seminar: Calculation of capacity of different adsorbents. Ion exchange, the possibilities of performances, calculation of ion exchange capacity. 5th week: Application of ion exchange processes in the preparation of process water. Seminar: Calculation of water hardness on the basis of chemical composition. The written knowledge tests. 6th week: The use of ion exchange in removal of heavy metal ions from water. Seminar: Design of ion exchanger, preparation of seminar works in the working groups. 7th week: Coagulation and Flocculation. Choosing a coagulant in the industry. The

	carbonate hardness. Water softening. Seminar: The calculation of precipitating agent dose, preparation of seminar works in the working groups. 8th week: Wastewater treatment. Selection methods and pathways for wastewater treatment. Seminar: preparation of seminar works in the working groups. 9th week: Biological treatment of wastewater. Aerobic and anaerobic treatment methods, design of bioreactors. Seminar: preparation of seminar works in the working groups. The written knowledge tests. 10th week: Phosphorus and nitrogen compounds in the treated effluent. Removal of nutrients from the water. Seminar: preparation of seminar works in the working groups. 11th week: Overview of advanced water purification process. Examples of multiple use of water in industry. Seminar: Oral presentation of the seminar works. 12th week: Examples of methods of wastewater treatment industry of alcoholic and non-alcoholic beverages. Seminar: Oral presentation of the seminar works. 13th week: Examples of methods of wastewater treatment industries of dairy products. Seminar: Oral presentation of the seminar works. 14th week: Examples of methods of wastewater treatment industry of meat and associated products. Field work - Visit the plant for the preparation of drinking water. 15th week: Field work - Visit the plant for sewage wastewater treatment. The written knowledge tests. 1st Laboratory exercise: Monitoring the process of adsorption of dissolved organic matter on the activated carbon by batch method using COD. Calculation of main process parameters. 2nd Laboratory exercise: Kinetic monitoring of biochemical degradation of organic matter using BOD. Calculation of the kinetic parameters. 3rd Laboratory exercise: Testing of coagulation and flocculation of colloidal particles dispersed in the aqueous solutions using jar test. 4th Laboratory exercise: Water softening using milk lime. 5th Laboratory exercise: Removal of total hardness of water neutral cation exchanger 6th Laboratory exercise: Removal of Pb^{2+} using zeolite fixed bed method. Calculation of removal capacities in relation to the operating conditions.
Format of instruction	x lectures x seminars and workshops x exercises □*on line* in entirety □partial e-learning x field work □independent assignments x multimedia x laboratory □work with mentor □ (other)
Student responsibilities	

Screening student work*(name the proportion of ECTS credits for each activity so that the total number of ECTS credits is*	Class attendance	2.5	Research		Practical training	
	Experimental work	2.0	Report	0.2	Field work	0.2
	Essay		Seminar essay	0.3	(Other)	
	Tests	0.3	Oral exam	0.2	(Other)	

equal to the ECTS value of the course)	Written exam	0.3	Project		(Other)	

Grading and evaluating student work in class and at the final exam	The requirement for admission to laboratory exercises is passed an oral colloquium for each exercise. Overall assessment can be applied over three written tests and one oral assessment. Written tests are related to material adopted in lectures, seminars, field work and laboratory exercises. The oral test is related to the presentation of the seminar work. Ratings on the written exam and the written exams: 60-69% is sufficient, 70-79% good, 80-89% is very good, 90-100% excellent. Students who have not passed the exam through the assessment should have the regular exam. Regular exam means written test and oral exam. The rating, which is entered in the index, is the mean score of written test, oral test and laboratory exercises.

	Title	**Number of copies in the library**	**Availability via other media**
Required literature (available in the library and via other media)	D. Hendrics, Water Treatment Unit Processes, Taylor and Francis Group, Boca Raton, 2006.		
	S. Tedeschi, Zaštita voda, HDGI, Zagreb, 1997.		
	R.D. Noble, P.A. Terry, Principles of Chemical Separations with Environmental Applications, Cambridge University press, 2004.		
	N.G. Wung Jern, Industrial Wastewater Treatment, Imperial College Press, London, 2006.		

Optional literature (at the time of submission of study programme proposal)	F. N. Kemmer, Prijevod: I. Begovic, D. Vidić, Nalkov priručnik za vodu, Građevinska knjiga 2005.
Quality assurance methods that ensure the acquisition of exit competences	- Consultation with students - Continuous writing assessment - Results on the written knowledge tests - Student's questionnaire.
Other (as the proposed wishes to add)	

Food Product Development

NAME OF THE COURSE	Food Product Development							
Code	KTK314	Year of study	3.					
Course teacher	PhD, Višnja Katalinić Full Professor	Credits (ECTS)	4.0					
Associate teachers	Ivana Generalić Mekinić, PhD Danijela Skroza	Type of instruction (number of hours)	L	S	E	F		
			15	30				
Status of the course	Elective	Percentage of application of e-learning	0					
COURSE DESCRIPTION								
Course objectives	The aim of this course is to familiarizes student with reasons for developing food product. Students will get basic knowledge about the main steps (5D) in food product development and understand that food-product development comprises many disciplines. Student will learn to design, produce and evaluate a food product.							
Course enrolment requirements and entry competences required for the course								
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Upon successful completion of this course, students will be able to: - define new food product - understand the reasons for developing food product - identify and discuss five major steps in food product development - understand the importance of team work and interdisciplinary approaches in the development of food product							
Course content broken down in detail by weekly class schedule (syllabus)	1st week: Definition of new food product; Introduction to food product development - Reasons for developing food product. 2nd week: Five phases to developing and marketing a new food product known as the 5D's (*Decide, Discover, Define, Develop and Deploy*); 3rd week: Brainstorming, establishing the goals and market demands; 4th week: Develop and refine the concept establishing processing, packaging, preservation and regulatory guidelines; 5th week Coolloquium1 6th week- 7nd week: Concept testing and prototyping; Product refinement, costing, manufacturing and packaging 8th week: Shelf-life testing, sensory analysis, physical, chemical and biochemical properties tested; 9th week: In use testing and customer acceptance testing; Product launch and roll out, investor presentation, marketing and trade shows 10 th week: Coolloquium2 11 th week: Students decision on new food product to research and develop; 12 th -14 th week: Competitive work of student groups 15 th week: Presentation and defence of seminar paper							
Format of instruction	**x** lectures **x** seminars and workshops □ exercises □ *on line*in entirety □ partial e-learning □ field work		□ independent assignments **x** multimedia □ laboratory □ work with mentor □ (other)					
Student responsibilities	Admission to the lectures and seminars of at least 70% of the times scheduled							
Screening student work*(name the*	Class attendance	1.0	Research		Practical training			

proportion of ECTS credits for eachactivity so that the total number of ECTS credits is equal to the ECTS value of the course)	Experimental work		Report		(Other)	
	Essay		Seminar essay	2.0	(Other)	
	Tests	1.0	Oral exam	(0.5)	(Other)	
	Written exam	(0.5)	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 and evaluation of seminar work. The share of seminar work evaluation in the final grade is 40%. 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**
	M.D. Earle, R.L. Earle, Creating New Foods. The Product Developer's Guide- the Web Edition http://www.nzifst.org.nz/creatingnewfoods/		Yes
	Nutrition for Health and Development, WHO Progress Report 2000. WHO, Diet, Nutrition and Prevention of Chronic Diseases, FAO expert report, Geneva: World Health Organisation, 2003.		Yes
Optional literature (at the time of submission of study programme proposal)	Gibson, M.W.Williams: *Functional foods*. CRC Press, Woodhead Publishing Limited, Boca Raton, Boston, New York, Washington, DC, 2000. Different selected scientific/professional journals and articles.		
Quality assurance methods that ensure the acquisition of exit competences	Quality of the teaching and learning, monitored at the level of the (1) teachers, accepting suggestions of students and colleagues, and (2) faculty, conducting surveys of students on teaching quality.		
Other (as the proposer wishes to add)			

Food Industry Waste Engineering

NAME OF THE COURSE	Food Industry Waste Engineering					
Code	KTK315	Year of study	3.			
Course teacher	PhD, Maja Kliškić, Full Professor PhD, Senka Gudić, Full Professor	Credits (ECTS)	4.0			
Associate teachers	PhD, Ivana Smoljko, Full Professor	Type of instruction (number of hours)	L	S	E	F
			30		10	5
Status of the course	Elective	Percentage of application of e-learning				

COURSE DESCRIPTION	
Course objectives	After completed course students will have acquired knowledge about food industry waste management, current food process waste regulations and disposal practices and understanding of waste beneficial reuse and bio-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 completed course students will be able to: – identify the diverse types of waste generated by various branches of the food industry, – interpret environmental protection laws and regulations related to food industry waste, – present methods for the treatment of waste from food processing industry, – present principles and methods of recycling waste from food processing industry present possibilities of waste energy utilization.
Course content broken down in detail by weekly class schedule (syllabus)	1st week: Food industry waste. Technological, economic and social aspects of disposal and/or utilization of wastes. 2nd week: Laws and regulations related to environmental protection considering food industry waste. 3rd week: Waste management; health and safety policies and procedures. 4th week: Waste disposal. Types of landfills, safety and activities at landfill. 5th week: Development of optimized systems for the treatment of food industry waste. 6th week: Principles and methods of recycling waste of the food industry - sanitary landfills, composting. 7th week: Incineration and pyrolysis. 8th week: New technologies. First test. 9th week: Development and application of biological methods for the recovery of organic waste and byproducts. 10th week: Waste energy utilization; waste as alternative fuel, generation of heat energy. 11th week: Generation of electricity. Biogas. 12th week: Biomass as a source of energy. 13th week: Technologies of converting biomass into energy. 14th week: Hydrogen as a fuel – biohydrogen. Hydrogen production processes from biomass and biodegradable waste. 15th week: Hydrogen production processes from biomass and biodegradable waste.

<table>
<tr><td></td><td colspan="6">Second test.

Exercises: Reuse/recycle citrus peels. Ethanol production by distillation of fermented grape pomace. Calcium tartrate production. Fieldwork at the Karepovac landfill. Fieldwork at the Cijan d.o.o. company.</td></tr>
<tr><td>Format of instruction</td><td colspan="3">x lectures
□seminars and workshops
x exercises
□on linein entirety
□partial e-learning
x field work</td><td colspan="3">□ independent assignments
x multimedia
□laboratory
□work with mentor
□ (other)</td></tr>
<tr><td>Student responsibilities</td><td colspan="6">Lecture attendance: 80 %. Exercises attendance: 100 %. Field work attendance: 100 %.</td></tr>
<tr><td rowspan="6">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)</td><td>Class attendance</td><td>1.0</td><td>Research</td><td></td><td>Practical training</td><td>1.0</td></tr>
<tr><td>Experimental work</td><td></td><td>Report</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Tests</td><td>2.0</td><td>Oral exam</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td></td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td></td><td colspan="5"></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="6">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 and field work with 20%. On examination shedule students will have oral exam. Scoring: <60% insufficient, 61 - 69% - sufficient (2), 70 - 79% - good (3), 80-89% very good (4), 90 - 100% - excellent (5).</td></tr>
<tr><td rowspan="3">Required literature (available in the library and via other media)</td><td colspan="3">Title</td><td>Number of copies in the library</td><td colspan="2">Availability via other media</td></tr>
<tr><td colspan="3">G. Tchobanoglous, F. Kreith, Handbook of Solid Waste Menagement (2nd ed.), McGraw-Hill, New York, 2002.</td><td>1</td><td colspan="2"></td></tr>
<tr><td colspan="3">I. S. Arvanitoyannis, Waste Management for the Food Industries, Academic Press, 2007.</td><td>1</td><td colspan="2"></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="6">1. L. K. Wang, Y.-T. Hung, H. H. Lo, C. Yapijakis, Waste Treatment in the Food Processing Industry, CRC Press, 2005.
2. M. Kliškić, Kruti otpad i recikliranje, Upute za vježbe, Kemijsko-tehnološki fakultet u Splitu, Split 2000.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="6">Quality of the teaching and learning, monitored at the level of the (1) teachers, accepting suggestions of students and colleagues, and (2) faculty, conducting surveys of students on teaching quality.</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="6"></td></tr>
</table>

Mineral Raw Materials from Seawater

NAME OF THE COURSE	Mineral Raw Materials From Seawater					
Code	KTK316	Year of study	3.			
Course teacher	PhD, Vanja Martinac, Full Professor	Credits (ECTS)	4.0			
Associate teachers		Type of instruction (number of hours)	L	S	E	F
			30		15	
Status of the course	Elective	Percentage of application of e-learning				
COURSE DESCRIPTION						
Course objectives	Through the program of lectures and exercises, the students master the knowledge of basic properties of seawater and methods of exploiting mineral raw materials from seawater.					
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, students are expected to: - explain and discern physical and chemical properties of seaware - discern macro and micro constituents in seawater - carry out the analysis of seawater for the content of calcium and magnesium independently according to work instructions - carry out the analysis of seawater for the boron content independently according to work instructions - determine the CO_2 content in seawater independently according to work instructions - describe technological processes of extracting mineral raw materials (magnesium, sodium chloride, bromine and fresh water) from seawater					
Course content broken down in detail by weekly class schedule (syllabus)	1st week: Seawater – a source of mineral raw materials. 2nd week: The basic properties of seawater. 3rd week: Physical and chemical characteristics of the seawater. 4th week: Composition of seawater. Classification of components dissolved in seawater. 5th week: Concentration and chemical forms of elements in seawater. 6th week: Constant ratios of major components of seawater. 7th week: Minor components of seawater. 8th week: Isothermal evaporation of seawater and separation of individual salts. 9th week: The effect of climactic and other factors on the evaporation process. 10th week: Evaporation of concentrated sea bittern. 11th week: Possibilities of technological exploitation of seawater. 12th week: Extraction of common salt. 13th week: Extraction of bromine from seawater. 14th week: Recovery of magnesium and magnesium compounds from seawater. 15th week: Extraction of fresh water from the seawater – desalination processes. *Exercises*: During exercises, seawater is chemically analysed for the content of calcium, magnesium, boron and free CO_2. Practical knowledge is obtained of technological processes of extracting mineral raw materials (magnesium oxide and sodium chloride) from seawater. List of Exercises: Analysis of seawater for its content of magnesium oxide and calcium oxide, Analysis of seawater for its content of CO_2, Determination of boron in seawater, Recovery of magnesium oxide from seawater (seawater pretreatment, precipitation with 80% of the stoichiometric quantity of dolomite lime, washing and filtration, calcinations of magnesium					

<table>
<tr><td></td><td colspan="6">hydroxide, chemical analysis of magnesium oxide from seawater), The visit to industrial plant – salt works - extraction of common salt from seawater.</td></tr>
<tr><td>Format of instruction</td><td colspan="3">x lectures
□seminars and workshops
x exercises
□on linein entirety
□partial e-learning
x field work</td><td colspan="3">□independent assignments
x multimedia
□laboratory
□work with mentor
□ (other)</td></tr>
<tr><td>Student responsibilities</td><td colspan="6">Attendance to lectures for 80% of the total number of hours. Full attendance to exercises and field work (100% of the total number of hours).</td></tr>
<tr><td rowspan="5">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)</td><td>Class attendance</td><td>1.0</td><td>Research</td><td></td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td>1.0</td><td>Report</td><td>0.5</td><td>Field work</td><td>0.5</td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Tests</td><td></td><td>Oral exam</td><td>1.0</td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td></td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="6">Attendance to lectures is registered (not included in the rating). During the semester students have to perform exercises (lab and field work). Exercises participate with 30% in the rating. An oral exam is held in the examination periods. The oral exam is mandatory for all students.
Ratings: 60 %-70 % - satisfactory, 71 %-80 % - good, 81 %-90 % - very good, 91 %-100 % - excellent.</td></tr>
<tr><td rowspan="6">Required literature (available in the library and via other media)</td><td colspan="3">Title</td><td>Number of copies in the library</td><td colspan="2">Availability via other media</td></tr>
<tr><td colspan="3">F. J. Millero, Chemical Oceanography, 3th Edition, CRC Press, Boca Raton, 2005.</td><td>1</td><td colspan="2"></td></tr>
<tr><td colspan="3">V. Martinac, Magnesium oxide from Seawater, (on line 2010-12-13), University handbook, (in Croatian), Faculty of Chemistry and Technology, Split, 2010.</td><td></td><td colspan="2">on line</td></tr>
<tr><td colspan="3">Desalination, Trends and Technologies, Ed by M. Schorr (on line 2011-02-28), InTechOpen, 2011.</td><td></td><td colspan="2">on line</td></tr>
<tr><td colspan="3">M. J. Kennish, Practical Handbook of Marine Science, 3rd Edition, CRC Press, Boca Raton, 2001.</td><td>1</td><td colspan="2"></td></tr>
<tr><td colspan="3">V. Martinac, M. Labor, Seawater as sources of mineral raw materials, (on line 2011-01-18), Laboratory exercises, Internal mimeographed notes, (in Croatian), Faculty of Chemistry and Technology, Split, 2011.</td><td></td><td colspan="2">on line</td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="6">M. E. Q. Pilson, Introduction to the Chemistry of the Sea, 2st edition, Prentice Hall, 2013.
K. Stowe, Exploring Ocean Science, Wiley, New York, 1996.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="6">Quality of the teaching and learning, monitored at the level of the (1) teachers, accepting suggestions of students and colleagues, and (2) faculty, conducting surveys of students on teaching quality.</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="6"></td></tr>
</table>

Safety at Work

NAME OF THE COURSE	Safety At Work					
Code	KTK 317	Year of study	3.			
Course teacher	PhD, Pero Dabić, Associate Professor	Credits (ECTS)	4.0			
Associate teachers		Type of instruction (number of hours)	L	S	E	F
			30		15	
Status of the course	Optional	Percentage of application of e-learning				

COURSE DESCRIPTION	
Course objectives	- Knowledge of the potential hazards when working in a laboratory and plant. - The basics of working in a safe manner, safeguards and protective devices and agents at work
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)	After passing the exam the student is expected to know: - Rules of conduct and work in the chemistry lab - Basic hazards in a chemistry lab - Ways of marking substance, meaning chemical Card (data on physico-chemical, physiological and toxicological properties of the substance) - Assessment of the potential dangers of certain chemicals and working with the apparatuses and methods of protection at work
Course content broken down in detail by weekly class schedule (syllabus)	1st week: an introductory lecture, legislation, codes of conduct in the laboratory 2nd week: the security apparatus in the chemistry lab 3rd week: safety and physico- chemical properties of the substance 4th week: Classification of substances with similar properties and functional groups 5th week: labeling - labels , graphic symbols , diamond hazard label when transporting 6th week: effect of pollutants on human health - basic concepts of toxicology and physiological properties of the substance, MAC, LD50 7th week: effect of pollutants on human health - division and features matter to the physiological properties 8th week: assessment (first colloquium); 9th week: burning processes and fire danger 10th week: appliances and equipment for fire fighting 11th week: Model Fire Extinguishers 12th week: types of harmful atmosphere and breathing apparatus 13th week: protection of electricity 14th week: dangerous products - the formation, classification according to UN figures, storage, recycling and waste 15th week: assessment (2nd colloquium). Laboratory exercises: Exercise 1 Stability of the alkali metal Exercise 2 Material flammability test Exercise 3 Determination of ignition point by Marcusson

<table>
<tr><td></td><td colspan="6">Exercise 4 Determination of physico - chemical properties of the solution with the aim of assessing the potential hazards</td></tr>
<tr><td>Format of instruction</td><td colspan="3">□x lectures
□ seminars and workshops
□x exercises
□ on linein entirety
□ partial e-learning
□x field work</td><td colspan="3">□ independent assignments
□x multimedia
□x laboratory
□ work with mentor
□ (other)</td></tr>
<tr><td>Studentresponsibilities</td><td colspan="6">Attending lectures in the amount of 80 %, and laboratory exercises in the amount of 100 % of the total number of lessons.</td></tr>
<tr><td rowspan="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)</td><td>Class attendance</td><td>1.0</td><td>Research</td><td></td><td>Practical training</td><td>0.8</td></tr>
<tr><td>Experimental work</td><td>1.0</td><td>Report</td><td></td><td>Preparation for the preliminary lab. exercises</td><td>0.2</td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Tests</td><td></td><td>Oral exam</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td>1.0</td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="6">Continuous evaluation:
The entire test can be applied over two exams during the semester. Passing threshold is 60 %. Each colloquium in assessing participates with 35 %. Laboratory exercises participate in the evaluation of 20 %. The presence of lectures in 80-100 % amount is 10 % of the grade.

Final evaluation:
Students who have passed the preliminary one, it is recognized as part of the exam and a 35 % score. The remaining part is laid in the regular examination period.

Students who have not passed any preliminary examination, written examination in the regular examination period laid the whole subject matter. Passing threshold is 60 %, and a written examination form to participate in the evaluation by 80 %. Laboratory work involved in assessing the proportion of 20 %.

Rating: sufficient (60-70 %), good (71-80 %), very good (81-90 %), excellent (91-100 %).</td></tr>
<tr><td rowspan="4">Required literature (available in the library and via other media)</td><td colspan="3">Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td colspan="3">P. Dabić_Sigurnost pri radu_Autorizirana predavanja _2013.</td><td>1</td><td rowspan="3">KTF website</td></tr>
<tr><td colspan="3">R. H. Hill, D.C. Finster, Laboratory Safety for Chemistry Students, John Wiley & Sons, Hoboken, New Jersey, 2010.</td><td>1</td></tr>
<tr><td colspan="3">P. Dabić, Vježbe iz kolegija sigurnost pri radu, KTF, Split, 2010.</td><td>1</td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="6">- B. Uhlik, Zaštita od požarno opasnih, toksičnih i reaktivnih tvari (I-III), Hrvatsko društvo kemijskih inženjera, Zagreb, 1998., 2000., 2003. i 2013.
- Zakon o zaštiti na radu, Zavod za istraživanje i razvoj sigurnosti, Zagreb, 2010.</td></tr>
</table>

Quality assurance methods that ensure the acquisition of exit competences	- Keeping records of class attendance - Annual analysis of examination performance - Monitoring suggestions and reactions of participants during the semester - Student survey
Other (as the proposer wishes to add)	

Introduction to Entrepreneurship

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="6">Introduction To Entrepreneurship</td></tr>
<tr><td>Code</td><td>KTK 318</td><td>Year of study</td><td colspan="5">3.</td></tr>
<tr><td>Course teacher</td><td>PhD, Krneta Mira, Asssitant Professor</td><td>Credits (ECTS)</td><td colspan="5">4.0</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2"></td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>F</td></tr>
<tr><td>30</td><td>15</td><td></td><td></td></tr>
<tr><td>Status of the course</td><td>Elective</td><td>Percentage of application of e-learning</td><td colspan="5"></td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">Introduction to Entrepreneurship provides (1) an overview of the definition of terms entrepreneurship, entrepreneurial activity and entrepreneur, impact of the entrepreneurship on the development and importance of entrepreneurial culture and infrastructure; (2) understanding and acquisition of practical knowledge and skills which is important for a business idea generation and evaluation in regard to market, technical and financial sustainability.</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">MS Office tools (Word, Excel, PowerPoint).</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">Graduates will be able to:
- Distinguish the entrepreneurship from other forms of the economic activity and entrepreneurs from small business owners.
- Define main elements of the business model for generating business ideas.
- Implement, individually and/or as a team work, process of definition, analysis and evaluation of the business idea sustainability.
- Distinguish the advantages and disadvantages of the different forms of entrepreneurial activity.
- Distinguish the different source of financing, including evaluation of the costs related to each source.
- Describe specific aspects of the business idea sustainability, in the form of written document.</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="6">1st week: Introduction: objectives, scope and content of the course; teaching and assessment methods (team work).
2nd week: Entrepreneurship, entrepreneur, entrepreneurial process: conceptual definition of the entrepreneurship and entrepreneurs; differences between entrepreneurs, managers and owners of independent businesses; models measuring the frequency and intensity of the entrepreneurial activity; stages of the entrepreneurial process, the importance of entrepreneurial activity and impact on employment growth, competitiveness, targeted groups. Entrepreneurial propensity of participants (questionnaire: self-assessment entrepreneurial skills, entrepreneurial aptitude, expectations of participants, the skills related to MS Office).
3rd week: Entrepreneurial idea, opportunity, intent and project: defining of the idea, opportunity, intent and project concept, business ideas sources, models for evaluation business ideas sustainability, the business idea and business plan differences. In teamwork, carrying out processes of business ideas, generating, ranking and defining the business ideas list.
4th week: Business model: explain of the term, main elements and benefits of defining of the business model, using of the business model’s examples, discuss with participants about the elements of a business model based on the identified business ideas. Using a business model’s template for define the elements of the</td></tr>
</table>

	business model for each of the entrepreneurial ideas. 5th week: Industry analysis: explanation of the importance of the industry analysis for entrepreneurial planning, explanation of the scope, content and methods of the industry analysis; explanation of the main elements of competition analysis, using examples. In teamwork, for each business project, determination of the corresponding industry, identification of the major trends of the industry and sources of the statistical data. 6th week: Market analysis: explanation of the market analysis importance, scope and content, possible approaches and methods; explanation of what is the market segmentation and the method of determining the target market explanation of the selling prices methods. Conducting market analysis, for each business project. 7th week: Marketing plan: explanation of the marketing strategy content and scope, the sales process activities and way of defining the promotional mix; explanation of the distribution channels content and scope. Creating a marketing plan for each business project. 8th week: Technical aspect of the entrepreneurial project: explanation of the terms, scope, content and technical aspects of the entrepreneurial planning, the importance of the definition of the project's micro and macro location, including the environmental protection and cost. Determining the technical aspect of the entrepreneurial project: various forms of assets (fixed and current assets), the location of the project. 9th week: Technological aspect of the entrepreneurial project: explanation of the terms, scope, content of the technological aspects of entrepreneurial planning explanation of the elements of the production and business processes, business functions, and elements of the organizational structure. Identifying the way of realization of production and business processes, organizational structure, management structure, business support functions. 10th week: Assessment of investment value and source of the funding: explanation of the importance of valuation, structure and dynamics of the entrepreneurial project's investments; explain possible sources of funding, the cost aspect of individual funding sources and method of estimating the costs of financing investment. For each entrepreneurial project: identifying the investment specific items and funding sources. 11th week: Economic aspect of the entrepreneurial project: explanation of the scope and content of the entrepreneurial project economic aspects, the elements of the entrepreneurial project economic viability. For individual projects: drawing up a table of the income and expenditure values. 12th week: Financial aspect of the entrepreneurial project: explanation of the scope and content of the entrepreneurial project financial aspects, the elements of the project's financial viability. For individual projects: estimation of the cost of financing and the indicators of the project's success. 13th week: Risk analysis: explanation of the concept of risk analysis and risk management, explanation of the importance of identifying potential risks and the likelihood of their occurrence; explanation of methods of risk management. For individual projects: identifying potential risks, assessing the likelihood of each risk and determining a way to avoid and reduce risks. 14th week: Sensitivity analysis: explanation of the content and scope of the entrepreneurial project sensitivity analysis, explanation of the sensitivity analysis method. At the project level, identifying the critical factors affecting the entrepreneurial project, determining the relative impact factors, conducting the sensitivity analysis of the project on the impact of each factor. 15th week: - Revision, assessment (test).	
Format of instruction	x lectures □ seminars and workshops □ exercises □ *on line* in entirety □ partial e-learning	x independent assignments □ multimedia □ laboratory □ work with mentor □ (other)

	□ field work					
Student responsibilities	Class participation and attendance – min. 80%. Individual (team) work – project.					
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		Practical training	
	Experimental work		Report		(Other)	
	Essay		Seminar essay		(Other)	
	Tests	1.0	Oral exam		(Other)	
	Written exam	1.0	Project	1.0	(Other)	
Grading and evaluating student work in class and at the final exam	Students' assessment is performed in the regular examination periods, by passing the written and oral examinations. The written part of the exam is 40% of the total points and the oral 50%. 10% of the total points are determined on the basis of lecture attendance, participation in discussions and group work (project). It is possible to pass the exam during the semester through: (1) passing the test (theoretical aspect of entrepreneurship), with more than 50% out of the total points, (2) successful development of the individual part of project within the group work and (3) regular attendance at lectures and participation in discussions. Rating scale: (1) 55-65% - satisfactory, (2) 66-76% - good, (3) 77-89% - very good, (4) 90-100% - excellent.					

	Title	**Number of copies in the library**	**Availability via other media**
Required literature (available in the library and via other media)	Morris, Michael; 2012.; Practical Guide to Entrepreneurship – How to turn an idea into a profitable business; KoganPage, London.		1
	Spinelli, Stephen, Jr; 2012.; New Venture Creation – Entrepreneurship for the 21th Century; 9th Edition; McGraw-Hill International Edition.		1
	Kuratko, Donald, F.; 2009.; Entrepreneurship Theory, Process and Practice; South-Western College Pub; 8th edition.		1
	Buble, Marin; Kružić, Dejan; 2006.; Poduzetništvo – realnost sadašnjosti i izazovi budućnosti; RRIF, Zagreb.		1
	Marsh, Clive; 2013.; Businee and Financial Models; KoganPage, London.		1
	Written materials prepared for lectures and team work (project)		1
	Morris, Michael; 2012.; Practical Guide to Entrepreneurship – How to turn an idea into a profitable business; KoganPage, London.		1
	Spinelli, Stephen, Jr; 2012.; New Venture Creation – Entrepreneurship for the 21th Century; 9th Edition; McGraw-Hill International Edition.		1
Optional literature (at the time of	Barrow C.P.; Barrow R.; 2005.; Brown The Business Plan Workbook: The Definitive Guide to Researching, Writing up and Presenting a Winning Plan; 6th edition;		

submission of study programme proposal)	Kogan Page; London and Philadelphia. Bendeković, J. i sur.; 2007.; Priprema i ocjena investicijskih projekata; FOIP 1974 d.o.o., Zagreb. European Commision; 2003.; Green Paper – Entrepreneurship in Europe; www.studentstarter.eu. Good Finance Guide for Small Businesses: How to raise, manage and grow your company's cash; A & C Black; London. Leburić, A.; Krneta, M.; 2003.; Profil poduzetnika; Naklada Bošković, Split. Nugus, N.; 2006.; Financial Planning using Excel: Forecasting, planning and budgeting techniques; second edition; Elsevier & Cima Publishing.
Quality assurance methods that ensure the acquisition of exit competences	Quality of the teaching and learning, monitored at the level of the (1) teachers, accepting suggestions of students and colleagues, and (2) faculty, conducting surveys of students on teaching quality.
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	
Location of building	
Year of completion	
Total square area in m^2	
Identification of building	
Location of building	
Year of completion	
Total square area in m^2	

3.2. List of teachers and associate teachers

Predmet	**Nastavnik**
Mathematics	PhD, Tanja Vučičić, Associate Professor
Physics	PhD, Mirko Marušić, Higher Lecturer
General Chemistry	PhD, Zoran Grubač, Full Professor PhD, Slobodan Brinić, Associate Professor
General Biology	PhD, Nada Bezić, Full Professor
Computers Application	PhD, Dražan Jozić, Associate Professor
General Microbilogy	PhD, Mirjana Skočibušić, Associate Professor
Inorganic Chemistry	PhD, Zoran Grubač, Full Professor PhD, Slobodan Brinić, Associate Professor Dr. sc.
Analytical Chemistry	PhD, Josipa Giljanović, Associate Professor
Food and Nutrition	PhD, Višnja Katalinić, Full Professor PhD, Tea Bilušić, Full Professor
Physical Chemistry	PhD, Renato Tomaš, Assistant Professor
Organic Chemistry	PhD, Ivica Blažević, Assistant Professor
Food Microbiology	PhD, Mirjana Skočibušić, Associate Professor
Transport Phenomena	PhD, Nenad Kuzmanić, Full Professor
Introduction to Food Technology	PhD, Višnja Katalinić, redoviti profesor

Sirovine u prehrambenoj industriji	Dr. sc. Tea Bilušić, Full Professor
Biochemistry	PhD, Mladen Miloš, Full Professor
Unit Operations	PhD, Marija Ćosić, Assistant Professor
Thermodynamics	PhD, Vanja Martinac, Full Professor
Measuring and Control Technique	Renato Stipišić, Lecturer
Processes in Food Industry	PhD, Višnja Katalinić, Full Professor
Food Chemistry	PhD, Mladen Miloš, Full Professor
Quality Managment	PhD, Josipa Giljanović, Associate Professor
Hygiene and Sanitation	PhD, Tea Bilušić, Full Professor
Basic Bioctehnology	PhD, Branka Andričić, Full Professor
Food Packaging	PhD, Nataša Stipanelov Vrandečić, Associate Professor
Water Technology	PhD, Marina Trgo, Associate Professor
Olive Processing Technologies	PhD, Ivica Ljubenkov, Assistant Professor
Technology of Grape Products	PhD, Višnja Katalinić, Full Professor
Fruit and Vegetable Processing	PhD, Tea Bilušić, Full Professor
Seafood Processing Technology	PhD, Vida Šimat, Assistant Professor
Milk and Dairy Products Technology	PhD, Tea Bilušić, Full Professor
Processing Technology of Herbs and Spices	PhD, Igor Jerković, Full Professor PhD, Višnja Katalinić, Full Professor
Methods of Food Analysis	PhD, Josipa Giljanović, Associate Professor
Food Product Development	PhD, Višnja Katalinić, Full Professor
Food Industry Waste Engineering	PhD, Maja Kliškić, Full Professor PhD, Senka Gudić, Full Professor
Mineral Raw Materials from Seawater	PhD, Vanja Martinac, Full Professor
Safety at Work	PhD, Pero Dabić, Associate Professor
Introduction to Entrepreneurship	PhD, Mira Krneta, Assistant Professor

3.3. Curriculum vitae of the course teacher

First and last name and title of teacher	**Tanja Vučičić, PhD**
The course he/she teaches in the proposed study programme	Mathematics
GENERAL INFORMATION ON COURSE TEACHER	
Address	Zvonimirova 125, 21210 Solin, Croatia
Telephone number	091 795 69 32
E-mail address	vucicic@pmfst.hr
Personal web page	http://www.pmfst.hr/~vucicic
Year of birth	1955
Scientist ID	105526
Research or art rank, and date of last rank appointment	Senior scientific associate, October 17, 2007
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Associate professor, December 18, 2013
Area and field of election into research or art rank	Science, Mathematics
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Science, Department of Mathematics, University of Split
Date of employment	October 15, 2008
Name of position (professor, researcher, associate teacher, etc.)	Associate professor
Field of research	Mathematics/Combinatorics and Discrete mathematics
Function	
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD in Mathematics
Institution	Faculty of Science, Department of Mathematics, University of Zagreb
Place	Zagreb, Croatia
Date	October 8, 1999
INFORMATION ON ADDITIONAL TRAINING	
Year	1995 and 1996
Place	Heidelberg, Germany
Institution	Mathematisches Institut Universitat Heidelberg
Field of training	Discrete mathematics, Design theory

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, proficient user (C1)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	French, basic user (A1/A2)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	Italian, basic user (A1/A2)
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)	Many years of experience in teaching similar calculus courses at the following undergraduate study programmes, University of Split: -Marine Biology and Ecology, Dept. of Marine Studies; -Marine fisheries, Dept. of Marine Studies; -Biology and Chemistry, Faculty of Science; -Pharmacy, Faculty of Chemistry nad Technology.
Authorship of university/faculty textbooks in the field of the course	Faculty textbook: http://www.pmfst.hr/~vucicic/nastava/Matematika%20za%20nematematicke%20studije/
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	Professional articles with unergraduate students working on diploma thesis: 1. A. Golemac, A. Mimica, T. Vučičić, *Od königsberških mostova do kineskog poštara*, math.e, 21 (2012). http://e.math.hr/math_e_article/br21/golemac2 2. A. Golemac, D. Šarac i T. Vučičić, *Pascalov trokut za t-dizajne*, math.e, 21 (2012). http://e.math.hr/math_e_article/br21/golemac1 3. J. Kovačević, J. Mandić i T. Vučičić, *Geršgorin's Location of the Spectrum and Applications*, accepted for publication in Osječki matematički list of June, 2014.
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?-	In 1990 enroled on an appropriate supplementary study programme at the Faculty of Philosophy in Zadar, Univerity of Split, and passed the exams of the courses „Pedagogy“ and „Psychology“.
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	

First and last name and title of the lecturer	**PhD, Mirko Marušić, Higher Lecturer**
The course he/she teaches in the proposed study programme	Physics
GENERAL INFORMATION ON COURSE TEACHER	
Address	Teslina 10/V, 21000 Split, Republic of Croatia
Telephone number	021/329-450
E-mail address	mmarusic@ktf-split.hr
Personal web page	
Year of birth	1971.
Scientist ID	337170
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	senior lecturer, December 12th 2013
Area and field of election into research or art rank	natural sciences, physics
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Chemistry and Technology, University of Split
Date of employment	January, 9th 2014
Name of position (professor, researcher, associate teacher, etc.)	senior lecturer
Field of research	physics
Function	
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Ph.D. in the science of methodology of teaching physics
Institution	Faculty of Natural Sciences and Mathematics
Place	Sarajevo
Date	March 5th 2013
INFORMATION ON ADDITIONAL TRAINING	
Year	
Place	
Institution	
Field of training	
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 (4)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
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)	*Music acoustics*, undergraduate programme of Music art of Composition, Art academy, University of Split
Authorship of university/faculty textbooks in the field of the course	
Professional, scholarly and artistic articles published in the last five	1. Marušić, Mirko; Sliško, Josip. Influence of Three Different Methods of Teaching Physics on the Gain in Students'

years in the field of the course (5 works at most)	Development of Reasoning. // *International Journal of Science Education*. 34 (2012) , 2; 301-326 (article, scientific). 2. Marušić, Mirko; Sliško, Josip. Effects of two different types of physics learning on the results of CLASS test. // *Physical Review Special Topics. Physics Education Research*. 8 (2012) ; (article, scientific). 3. Marušić, Mirko; Sliško, Josip. Increasing the attractiveness of school physics: the effects of two different designs of physics learning. // *Revista Mexicana de Física E*. 58 (2012) , 1; 75-83 (article, scientific). 4. Erceg, Nataša; Marušić, Mirko; Sliško, Josip. Students' strategies for solving partially specified physics problems. // *Revista Mexicana de Fisica E*. 57 (2011) , 1; 44-50 (article, scientific). 5. Marušić, Mirko; Erceg, Nataša; Sliško, Josip. Partially specified physics problems: university students' attitudes and performance. // *European journal of physics*. 32 (2011) , 3; 711-722 (article, scientific).
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	1. Marušić, Mirko; Sliško, Josip. Influence of Three Different Methods of Teaching Physics on the Gain in Students' Development of Reasoning. // *International Journal of Science Education*. 34 (2012) , 2; 301-326 (article, scientific). 2. Marušić, Mirko; Sliško, Josip. Effects of two different types of physics learning on the results of CLASS test. // *Physical Review Special Topics. Physics Education Research*. 8 (2012) ; (article, scientific). 3. Erceg, Nataša; Marušić, Mirko; Sliško, Josip. Students' strategies for solving partially specified physics problems. // *Revista Mexicana de Fisica E*. 57 (2011) , 1; 44-50 (article, scientific). 4. Marušić, Mirko; Erceg, Nataša; Sliško, Josip. Partially specified physics problems: university students' attitudes and performance. // *European journal of physics*. 32 (2011) , 3; 711-722 (article, scientific). 5. Marušić, Mirko; Sliško, Josip. Physics Education Research in Croatia: Historical Roots and Actual Trends. // *European Journal of Physics Education*. 3 (2012) , 2; 34-51 (review article, professional).
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 lecturer passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences	2007 – Postgraduate study – Didactics of natural sciences – Physics; Faculty of Natural Sciences and Mathematics, University of Split 1996 – Undergraduate study programme – course of study: mathematics and physics teacher, Faculty of Natural Sciences and Mathematics, University of Split
PRIZES AND AWARDS, STUDENT EVALUATION	
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 teacher	**PhD, Zoran Grubač, Full Professor**
The course he/she teaches in the proposed study programme	General Chemistry Inorganic Chemistry
GENERAL INFORMATION ON COURSE TEACHER	
Address	Teslina 10/V, 21 000 Split
Telephone number	021 329 473
E-mail address	grubac@ktf-split.hr
Personal web page	http://www.ktf-split.hr/~grubac/
Year of birth	1960.
Scientist ID	126072
Research or art rank, and date of last rank appointment	Science adviser, 2. October 2013.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Full professor 19. December 2013.
Area and field of election into research or art rank	Natural science; Chemistry
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Chemistry and Technology, University of Split, Croatia
Date of employment	1. September1985.
Name of position (professor, researcher, associate teacher, etc.)	professor
Field of research	Electrochemistry, inorganic chemistry
Function	Dean
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty of Chemical Engineering and Chemistry
Place	Zagreb, Croatia
Date	12. November 1996.
INFORMATION ON ADDITIONAL TRAINING	
Year	
Place	
Institution	
Field of training	
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 (4)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	

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)	Courses:General chemistry, General and Inorganic chemistry, Inorganic Chemistry (graduated study of Chemistry, graduated study of chemical engineering, Faculty of Chemistry and Technology Split)
Authorship of university/faculty textbooks in the field of the course	1. Z. Grubač, Lectures from general chemistry, Faculty of chemistry and technology, Split, 2007. (Opća kemija: http://www.ktf-split.hr/~grubac/ opca.htm) 2. Z. Grubač Lectures from inorganic chemistry, Faculty of chemistry and technology, Split, 2007. (http://mak.ktf-split.hr/~grubac/anorganska.htm)
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. Z. Grubač, M. Metikoš-Huković, R. Babić, Nanocrystalline and coarse grained polycrystalline nickel catalysts for the hydrogen evolution reaction, International Journal of Hydrogen Energy, 38 (2013) 4437-4444. 2. Z. Grubač, M. Metikoš-Huković, R. Babić, I. Škugor Rončević, M. Petravić, R. Peter, Functionalization of biodegradable magnesium alloy implants with alkylphosphonate self-assembled films, Mater. Sci. Eng. C 33 (2013) 2152-2158. 3. M. Metikoš-Huković, R. Babić, I. Škugor Rončević, Z. Grubač, Corrosion Behavior of the Filmed Copper Surface in Saline Water under Static and Jet Impingement Conditions, Corrosion 68 (2012) 025002-1-025002. 4. M. Metikoš-Huković, Z. Grubač, R. Babić, N. Radić, Corrosion resistance of amorphous aluminium-molybdenum alloys in an acidic chloride environment, Corros. Sci. 52 (2010) 352-359. 5. M. Metikoš-Huković, R. Babić, Z. Grubač, Passivation of Aluminum-Molybdenum Alloys in Hydrochloric Acid, J. Electrochem. Soc. 156 (2009) C435-C440.
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)	1. Bilateral Craotian-Slovenian project: Bioengieering metal materials and functional coatings for medical application, from 2010. to 2011. 2. Project 125-0982904-2932 “New materials and catalysts for sustainable technologies; from 2002. to 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?-pedagoške kompetencije?	
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	
Results of student evaluation taken	Evaluation organizer: University of Split

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)	General Chemistry: Average Grade: 4.3 Inorganic Chemistry: Average Grade: 4.3

First and last name and title of teacher	**PhD Nada Bezić, Full Professor**
The course he/she teaches in the proposed study programme	General Bology
GENERAL INFORMATION ON COURSE TEACHER	
Address	Rendićeva 17. Split
Telephone number	+385(0)384-861
E-mail address	bezic@pmfst.hr
Personal web page	http://www.pmfst.hr
Year of birth	1953
Scientist ID	105170
Research or art rank, and date of last rank appointment	Scientific Advisor, 22. 05. 2013.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Professor, 28. 06. 2013.
Area and field of election into research or art rank	Natural Science, Biology
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Natural Science, Split
Date of employment	1981.
Name of position (professor, researcher, associate teacher, etc.)	Professor
Field of research	Botany- secondary metabolites, plant viruses
Function	
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty of Natural Science, University of Zagreb
Place	Zagreb
Date	1991.
INFORMATION ON ADDITIONAL TRAINING	
Year	1997. i 1998 godine.
Place	Glasgow UK (Scotland) i Prag (Republka Češka)
Institution	University of Glasgow, Division of Enviromental and Evolutionary Biology i Charles University, Department of Plant Physiology
Field of training	Plant anatomy
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 4/5
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	French 3
Foreign language and command of foreign language on a scale from 2	

(sufficient) to 5 (excellent)	
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)	Cell biolgy, General Botany, Botany, Flavour and Aromatic Plants, Virology Biology and chemistry and Nutrition on Faculty of Natural Science, University of Split
Authorship of university/faculty textbooks in the field of the course	Lectures of cours Cell biolgy and General Botany on websites of Faculty of Natural Sciences University of Split
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. Kremer, Dario; Dragojević, Müller Ivna; Edith, Stabentheiner; Vitali, Dubravka; Kopričanec, Martina; Ruščić, Mirko; Kosalec, Ivan; **Bezić, Nada**; Dunkić, Valerija: Phytochemical and micromorphological traits of endemic *Micromeria pseudocroatica* Šilić (Lamiaceae). Natural Product Communications. **7.** 2012. 166**7-**1670. 2. Dunkić, Valerija; Kremer, Dario; Dragojević Müler, Ivna; Stabentheiner, Edith; Kuzmić, Sunčica; Jurišić Grubešić, Renata; Vujić, Lovorka; Kosalec, Ivan; Randić, Marko; Srečec, Siniša; **Bezić, Nada**. Chemotaxonomic and micromorphological traits of Satureja montana L. and S. subspicata Vis. (Lamiaceae). Chemistry & biodiversity. 9. 2012. 2825 – 2842. 3. Dario, Kremer; Ivna, Dragojević, Müller; Valerija, Dunkić; Dubravka, Vitali; Edith, Stabentheiner; Andreas, Oberländer; **Nada, Bezić**; Ivan, Kosalec. Chemical traits and antimicrobial activity of endemic Teucrium arduini L. from Mt Biokovo (Croatia). Central European Journal of Biology. 7**.** 2012. 941**-**947. 4. **Bezić, Nada;** Elma, Vuko; Valerija, Dunkić; Mirko, Ruščić; Ivica, Blažević; Franko, Burčul. Antiphytoviral Activity of Sesquiterpene-Rich Essential Oils from Four Croatian *Teucrium* Species. Molecules 16. 2011. 8119-8129. 5. **Bezić, Nada**; Šamanić, Ivica; Dunkić, Valerija; Besendorfer, Višnja; Puizina, Jasna. Essential Oil Composition and Internal Transcribed Spacer (ITS) Sequence Variability of Four South-Croatian *Satureja* Species (Lamiaceae). Molecules 14. 2009. 925-938.
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 MSES Republic of Croatia Xerophytes and their Secondary Metabolites (177-1191192-0830) 1. Kremer, Dario; Dragojević, Müller Ivna; Edith, Stabentheiner; Vitali, Dubravka; Kopričanec, Martina; Ruščić, Mirko; Kosalec, Ivan; **Bezić, Nada**; Dunkić, Valerija: Phytochemical and micromorphological traits of endemic *Micromeria pseudocroatica* Šilić (Lamiaceae). Natural Product Communications. **7.** 2012. 166**7-**1670. 2. Dunkić, Valerija; Kremer, Dario; Dragojević Müler, Ivna;

	Stabentheiner, Edith; Kuzmić, Sunčica; Jurišić Grubešić, Renata; Vujić, Lovorka; Kosalec, Ivan; Randić, Marko; Srečec, Siniša; **Bezić, Nada**. Chemotaxonomic and micromorphological traits of Satureja montana L. and S. subspicata Vis. (Lamiaceae). Chemistry & biodiversity. 9. 2012. 2825 – 2842. 3. Dario, Kremer; Ivna, Dragojević, Müller; Valerija, Dunkić; Dubravka, Vitali; Edith, Stabentheiner; Andreas, Oberländer; **Nada, Bezić**; Ivan, Kosalec. Chemical traits and antimicrobial activity of endemic Teucrium arduini L. from Mt Biokovo (Croatia). Central European Journal of Biology. 7**.** 2012. 941**-**947. 4. **Nada, Bezić;** Elma, Vuko; Valerija, Dunkić; Mirko, Ruščić; Ivica, Blažević; Franko, Burčul. Antiphytoviral Activity of Sesquiterpene-Rich Essential Oils from Four Croatian *Teucrium* Species. Molecules 16. 2011. 8119-8129. 5. **Bezić, Nada**; Šamanić, Ivica; Dunkić, Valerija; Besendorfer, Višnja; Puizina, Jasna. Essential Oil Composition and Internal Transcribed Spacer (ITS) Sequence Variability of Four South-Croatian *Satureja* Species (Lamiaceae). Molecules 14. 2009. 925-938
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?	
PRIZES AND AWARDS, STUDENT EVALUATION	
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 teacher	**PhD, Dražan Jozić, Associate Professor**
The course he/she teaches in the proposed study programme	Computer application
GENERAL INFORMATION ON COURSE TEACHER	
Address	Teslina 10/V, 21000 Split
Telephone number	021-329-442
E-mail address	jozicd@ktf-split.hr
Personal web page	http://kefa.ktf-split.hr/home/nastava/172-djelatnici/cv/155-drazanjozic.html
Year of birth	1974.
Scientist ID	231234
Research or art rank, and date of	Senior research scientist, 26.12.2013.

last rank appointment	
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	PhD, Associated professor, 29.05.2013.
Area and field of election into research or art rank	Area:Technical Sciences, Field: Chemical Engineering
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Chemistry and Technology
Date of employment	01.07.2003.
Name of position (professor, researcher, associate teacher, etc.)	Associated professor
Field of research	Chemical Engineering in the developing a materials
Function	Member of the Department
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty of Chemistry and Technology
Place	Split
Date	20.07.2007.
INFORMATION ON ADDITIONAL TRAINING	
Year	2004.
Place	Monza, Italy
Institution	Perkin Elmer
Field of training	Training for maintaining, adjusting and properly operation of the instrument for thermogravimetric measurements with simultaneous differential thermal analysis (TG / DTA) model Perkin Elmer Pyris Diamond
Year	2010.-2011.
Place	Trieste, Italy
Institution	Elettra-Sincrotrone Trieste S.C.p.A.
Field of training	Application Synchrotron radiation in the different instrumental techniques and experimental methods of recording at Austrian SAXS beamline such as of Small Angles X-ray Scattering at (SAXS), Grazing-Incidence Small-Angle X-ray Scattering (GISAXS) and Wide-Angle X-ray Scattering (WAXS, XRD). in the purpose of developing materials in engineering materials especially nanostructured materials.
Year	2011.
Place	Planneralm, Austria
Institution	InstitutfürPhysik, MontanauniversitätLeoben, Austria
Field of training	Application Synchrotron and Neutron radiation in the purpose of Characterization different type of materials
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, 4
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
COMPETENCES FOR THE COURSE	
Earlier experience as course teacher of similar courses (name	Computer application, Undergraduate study: Chemistry, level 6 Computer application, Undergraduate study: Chemical

title of course, study programme where it is/was offered, and level of study programme)	Engineering, level 6 Computer application, Undergraduate study: Environmental protection, level 6
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)	
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?-pedagoškekompetencije?	
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	CEI Research Fellowship Programme (CERES) (Marie Currie/FP7)
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)	5

First and last name and title of teacher	**PhD, Skočibušić Mirjana, Associate Professor**
The course he/she teaches in the proposed study programme	General microbiology, Food microbiology
GENERAL INFORMATION ON COURSE TEACHER	
Address	Teslina 12, 21000 Split
Telephone number	021 38 51 33
E-mail address	Mirjana.Skocibusic@pmfst.hr
Personal web page	
Year of birth	1954
Scientist ID	137651
Research or art rank, and date of last rank appointment	Associate professor
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Natural sciences, field of biology, a branch of microbiology
Area and field of election into research or art rank	Teslina 12, 21000 Split
INFORMATION ON CURRENT EMPLOYMENT	

Institution where employed	1/09/1986.
Date of employment	Professor, researcher
Name of position (professor, researcher, associate teacher, etc.)	Research projects, work with science students-assistants, publications, teaching.
Field of research	Head of the scientific project and manager doctoral studies-Biology
Function	1/09/1986.
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD in Natural science, Biology (Microbiology)
Institution	Faculty of Science -University of Zagreb
Place	Zagreb
Date	12/02/1998.
INFORMATION ON ADDITIONAL TRAINING	
Year	
Place	
Institution	
Field of training	
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 (4)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	French (4)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
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)	Microbiology, General Microbiology, Marine Microbiology-undergraduate study of Biology and Chemistry, Special Microbiology - graduate studies in Biology and Chemistry, Bacteria, viruses and subviralni pathogens, Microbial Ecology-Doctoral studies in Education in the field of Natural and Engineering Sciences.
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)	Maravić, Ana; **Skočibušić, Mirjana**; Šamanić, Ivica; Fredotović, Željana; Cvjetan, Svjetlana; Jutronić, Marinka; Puizina, Jasna. Aeromonas spp. simultaneously harbouring blaCTX-M-15, blaSHV-12, blaPER-1 and blaFOX-2, in wild-growing Mediterranean mussel (*Mytilus galloprovincialis*) from Adriatic Sea, Croatia. ***International Journal of Food Microbiology***. 166 (2013) , 2; 301-308. Maravić, Ana; **Skočibušić, Mirjana**; Šamanić, Ivica; Puizina, Jasna. Profile and multidrug resistance determinants of *Chryseobacterium indologenes* from seawater and marine fauna. ***World journal of microbiology & biotechnology*.** 29 (2013) , 3; 515-522. Odžak, Renata; **Skočibušić, Mirjana**; Maravić, Ana. Synthesis and antimicrobial profile of N-substituted imidazolium oximes and their monoquaternary salts against multidrug resistant

	bacteria. ***Bioorganic & Medicinal Chemistry*.** 21 (2013) , 23; 7499-7506. Politeo, Olivera; Skočibušić, Mirjana; Burcul, Franko; Maravić, Ana; Carev, Ivana; Ruščić, Mirko; Miloš, Mladen. *Campanula portenschlagiana* Roem. et Schult. : Chemical and Antimicrobial Activities. ***Chemistry & biodiversity*.** 10 (2013) , 6; 1072-1080. Maravić, Ana**; Skočibušić, Mirjana**; Šamanić, Ivica; Puizina, Jasna. Antibiotic susceptibility profiles and first report of TEM extended-spectrum β-lactamase in *Pseudomonas fluorescens* from coastal waters of the Kaštela Bay, Croatia. ***World journal of microbiology & biotechnology*.** 28 (2012) , 5; 2039-2045.
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)	Indicators of fecal contamination and possible pathogens in coastal areas (177-0000000-3182) 2008 – 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?-pedagoške kompetencije?	The complete graduate studies of Biology - Professor of Biology
PRIZES AND AWARDS, STUDENT EVALUATION	
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)	Regular surveys of quality of teaching which is carried out by the University of Split. Ratings have been very positive.

First and last name and title of teacher	Ph. D. Višnja Katalinić, Full Professor
The course he/she teaches in the proposed study programme	1. Food and Nutrition 2. Introduction in Food Technology 3. Processes in Food Industry 4. Technology of Grape Products 5. Food Product Development
GENERAL INFORMATION ON COURSE TEACHER	
Address	Tesloina 10/V, 21000 Split
Telephone number	++385 21 558217
E-mail address	visnja@ktf-split.hr
Personal web page	http://tkojetko.irb.hr/znanstvenikDetalji.php?sifznan=13794
Year of birth	1950
Scientist ID	110963
Research or art rank, and date of last rank appointment	Senior research scientist - 13.03. 2007.

Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Full professor - 25.11.2010.
Area and field of election into research or art rank	Biotechnology; Food technology
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	University of Split Faculty of Chemistry and Technology
Date of employment	05. 07. 2004.
Name of position (professor, researcher, associate teacher, etc.)	Full professor, Faculty of Chemistry and Technology
Field of research	Food technology; Food Chemistry
Function	Head of Department of Food Technology and Biotechnology
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Ph.D. in Biotechnology
Institution	University of Zagreb Faculty of Food Technology and Biotechnology
Place	Zagreb
Date	02. 09. 1994.
INFORMATION ON ADDITIONAL TRAINING	
Year	1997.
Place	San Antonio; Texsas, SAD
Institution	Brooks Air Force Laboratories
Field of training	Hyperbaric oxygenation and oxidative stress
Year	1990
Place	Zug, Švicarska
Institution	Variran Educational Laboratories
Field of training	Chromatography: HPLC, SPE
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; very good (4)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
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)	Environment and Food Safety; Chemical Engineering in Materials Development and Environmental Protection; University postgraduate doctoral study Processes in Food Industry (KTD103); Chemical technology University graduate study; Processing of grapes (KTD 201); Chemical technology University graduate study; Nutrition Fundamentals (KTF307); Chemical technology, study orientation: Food technology; Proffesional study; Processes in Food Industry (KTF 204) Chemical technology, study orientation: Food technology; Proffesional study; Processing of grapes (KTF 205); Chemical technology, study orientation: Food technology; Proffesional study; Chemistry and technology of grapes and wine; Graduate study before Bologna process, Chemistry and technology of fruit; Graduate study before

	Bologna process
Authorship of university/faculty textbooks in the field of the course	Author of university handbook: Temeljno znanje o prehrani (Nutrition fundamentals), 2010. Co-author of two faculty teaching materials : Grape processing and Mediterranean fruit and vegetables processing - exercises
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	Katalinić, V., Smole Možina, S., Generalić, I., Skroza, D., Ljubenkov, I., Klančnik, A. (2013) Phenolic profile, antioxidant capacity and antimicrobial activity of leaf extracts from six Vitis vinifera L. varieties. , International Journal of Food Properties (LJFP), Vol. 16(1):45-60; Generalić, I; Burčul, F.; Blažević, I.; Skroza, D.; Kerum, D.; Katalinić, V. (2013) Biological importance of rosmarinic acid in Asteraceae plant extracts. Natural Product Communications (NPC), Vol:8, 471-474 Generalić, I.; Skroza, D.; Šurjak, J.; Smole Možina, S.; Ljubenkov, I.; Katalinić, A.; Šimat, V.; Katalinić, V. (2012). Seasonal Variations of Phenolic Compounds and Biological Properties in Sage (Salvia officinalis L.). Chem. Biodiv. 9 (2) 441-457. Generalić, I., Skroza, D., Ljubenkov, I., Katalinić, A., Burčul, F., Katalinić, V., (2011) Influence of the phenophase on the phenolic profile and antioxidant properties of Dalmatian sage, Food Chemistry 127: 427-433. Katalinić, V., Smole Možina, S., Skroza, D., Generalić, I., Abramovič, H., Miloš, M., Ljubenkov, I.Piskernik, S., Pezo, I., Terpinc, P.& Boban, M. (2010) Polyphenolic profile, antioxidant properties and antimicrobial activity of grape skin extracts of 14 Vitis vinifera varieties grown in Dalmatia (Croatia). Food Chemistry, 119:715-723
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)	*2007.-2013*: Head of national scientific project *2012-2014:* Head of Croatian rese„Natural sources of resveratrol and its synergic effect with other polyphenols" (011-2160547-2226). Field: Food Technology arch team in bilateral project: "Effect of medicinal plant phenolic extracts on the stability of grape anthocyanins"; (Croatia-Macedonia) *2010-2013:* Collaborator: International education project "Improvement Academia-Industry Link sin Food Safety and Quality" 158714-TEMPUS-1-2009-1-ES-TEMPUS-JPHE. *2009.-2010:* Head of Croatian research team in bilateral project Natural, biologically active additives for healthy and stable food (Croatia-Slovenia); Field: Food Technology 2007-2013: Collaborator in scientific project“Cardiovascular effcts of wine and wine components“ ; head of project: prof. M. Boban, School of Medicine. (216-2160547-0537)
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of	Self-education; Years of lecturing experience

competences?-pedagoške kompetencije?	
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	*2013* - Acknowledgment from Croatian Ministry of Science, Education and Sports *2013* – Faculty of Chemistry and Technology award for significant scientific and teaching contribution. *2011*- Food Chemistry journal acknowledgment (Top Cited article 2006-2010) 2011 - Marko Marulić" Polytechnics of Knin award „Zlatno pero" *2006* - Special acknowledgment from the Council of the "Marko Marulić" Polytechnics of Knin
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)	Evaluation organizer: University of Split Grading scale: 1-5 Course evaluated: 1. Grape processing or Chemistry and technology of grapes and wines: KTD201: 4,9(2012/13); 4,5(2011/12) 4,8(2010/11); (2009/10); 5(2008/09) 2. Grape processing KTF205: 4,7(2012/13); 5(2011/12); (2010/11); 4,7(2009/10); 4,5 (2008/09) 3. Processes in food industry KTF204a: 4,7(2012/13) 4,6(2011/12); 4,7(2010/11); 4,2(2009/10); 4,3(2008/09) 4. Processes in food industry KTD103a: 5(2012/13) 5(2011/12); 4,9(2010/11); 4,9(2009/10) 5. Basic in nutrition KTF307: 4,9(2012/13); 4,5(2011/12); 4,8(2010/11) 4,5(2009/10); 4,5(2008/09)

First and last name and title of teacher	**Ph.D. Tea Bilusic, Full Professor**
The course he/she teaches in the proposed study programme	Food and Nutrition Raw Materials in Food Industry Hygiene and Sanitation Fruit and Vegetable Processing Milk and Dairy Products Technology
GENERAL INFORMATION ON COURSE TEACHER	
Address	Nikole Tesle 10/V, HR-21000 Split
Telephone number	+385 21 329 466
E-mail address	tea@ktf-split.hr
Personal web page	https://tkojetko.irb.hr/znanstvenikDetalji.php?sifznan=8413
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
INFORMATION ON CURRENT EMPLOYMENT	
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
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Ph.D.
Institution	Faculty of Food Technology and Biotechnology, University of Zagreb
Place	Zagreb
Date	14.06.2004.
INFORMATION ON ADDITIONAL TRAINING	
Year	2000-2001 2002-2003 2006-2008
Place	Paris, France Fribourg, Switzerland Freising, Germany Regensburg, Germany
Institution	INRA, Institut National de la Recherche Agronomique Faculty of Science, Department of Biology, University of Fribourg Faculty of Food Science, Chair of Food Biofunctionality, Technical Univeristy of Munich (TUM) Faculty of Chemistry, University of Regensburg
Field of training	- isolation and characterization of probiotic *Lactobacillus* species from yogurth - isolation of phytochromes from model plant *Arabidopsis thaliana* - biologicallly active compounds from sea fennel and caper - low melting sugars
MOTHER TONGUE AND FOREIGN LANGUAGES	
Mother tongue	Croatian
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	French (4)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	English (4)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
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)	Introduction to Food Science; Milk and Dairy Technology (undergaduate study of Chemical Technology) Dietetics (graduate study of Pharmacy) Hygiene and Sanitation; Fruits and Vegetables Processing (graduate study of Chemical Technology)
Authorship of university/faculty textbooks in the field of the course	Analysis of Milk and Dairy Products, Handbook, University of Zagreb, Plejada 2012. Introduction to Food Science, revised teaching course, web pages of Faculty of Chemistry and Technology, 2013 Dietetics, revised teaching course, web pages of Faculty of Chemistry and Technology, 2013
Professional, scholarly and artistic articles published in the last five years in the field of the course (5	1. Politeo, O., Botica, I., **Bilusic, T**., Jukic, M., Carev, I., Burcul, F., Milos, M.: Chemical composition and evaluation of acetylcholinesterase inhibition and

works at most)	antioxidant activity of essential oil from Dalmatian endemic species *Pinus nigra* Arnold ssp. *dalmatica* (Vis.) Franco, *Journal of Medicinal Plant Research (2011), 5, 6590-6596* 2. **Kulisic-Bilusic, T**., Schmöller, I., Schnäbele, K., Siracusa, L., Ruberto, G.: The anticancerogenic potential of essential oil and aqueous infusion from caper (Capparis spinosa L.) , *Food Chemistry (2012), 132, 261-267* 3. Siracusa, L., **Kulisic-Bilusic, T**., Politeo, O., Krause, I., Dejanovic, B., Ruberto, G.: Phenolic composition and antioxidant activity of aqueous infusions from *Capparis spinosa* L. and *Crithmum maritimum* L. before and after submission to a two-step *in vitro* digestion model, *Journal of Agricultural and Food Chemistry (2011), 59, 12453-9* 4. **Kulisic-Bilusic, T**., Blazevic, I., Dejanovic, B., Milos, M., Pifat, G.: Evaluation of the antioxidant activity of essential oils from caper (*Capparis spinosa* L.) and sea fennel (*Crithmum maritimum* L.) by different methods, *Journal of Food Biochemistry (2010), 34, 286-302* 5. Mudnić, I., Modun, D., Brizić, I., Vuković, J., Generalić, I., Katalinić, V., **Bilušić, T**., Ljubenkov, I., Boban, M.: Cardiovascular effects *in vitro* of aqueous extract of wild strawberry (*Fragaria vesca*, L.) leaves, *Phytomedicine, (2009), 16, 462-469* *6.* **Kulisic-Bilusic, T**., Schmöller, I., Schnäbele, K., Dragovic-Uzelac, V., Krisko, A., Dejanovic, B., Milos, M., Pifat, G.: Antioxidant activity *versus* cytotoxic and nuclear factor kappa B regulatory activities on HT-29 cells by natural fruit juices, *European Food Research and Technology* (*2009), 228, 417-424*
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)	1. 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 2. 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?	
PRIZES AND AWARDS, STUDENT EVALUATION	
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 teacher	**PhD, Renato Tomaš, Assistant Professor**
The course he/she teaches in the proposed study programme	Physical Chemistry
GENERAL INFORMATION ON COURSE TEACHER	
Address	Department of Physical Chemistry, Faculty of Chemistry and Technology, University of Split, Teslina 10/V, 21000 Split, Croatia
Telephone number	++385(0)21 329 448
E-mail address	rtomas@ktf-split.hr
Personal web page	www.ktf-split.hr
Year of birth	20 June 1967
Scientist ID	226242
Research or art rank, and date of last rank appointment	Senior research associate (2 October 2013)
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Assistant professor (31 March 2011)
Area and field of election into research or art rank	Natural Sciences, Chemistry
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Chemistry and Technology (FCT), University of Split
Date of employment	1 January 2006
Name of position (professor, researcher, associate teacher, etc.)	Assistant professor
Field of research	*Solution chemistry (*properties of electrolytes in mixed solvents*):* thermodynamics of electrochemical reactions, thermodynamics of metal-ligand complexes formation, thermodynamics of the association reaction of electrolytes, transference number measurements of electrolytes and determination of limiting molar conductivities of ions, viscosity and density studies of electrolytes (study of ion-ion and ion-solvent interactions). *Supramolecular chemistry:* thermodynamics of calixarene chemistry. *Experimental methods used:* potentiometry, conductometry, viscometry and densitometry, UV-Vis spectrometry.
Function	Head of Department of Physical Chemistry, FCT, University of Split: 2007 - 2009 and 2011 -2013
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Ph.D. degree in Natural Sciences, Chemistry
Institution	Faculty of Chemistry and Technology (FCT), University of Split
Place	Split
Date	29 October 2002
INFORMATION ON ADDITIONAL TRAINING	
Year	2012 2008

Place	Ljubljana Zagreb
Institution	- Chair of Physical Chemistry, Department of Chemistry and Biochemistry, Faculty of Chemistry and Chemical Technology, University of Ljubljana, Slovenia - Division of Physical Chemistry, Department of Chemistry, Faculty of Science, University of Zagreb, Croatia
Field of training	Research training: solution chemistry and supramolecular chemistry. Teaching training: Physical Chemistry, Experimental Physical Chemistry, Chemometrics.
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 (good)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
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)	Lecturer in Selected Topics in Physical Chemistry of Environmental to Ph.D. students of chemistry. Lecturer in Colloid and Surface Chemistry to Ph. D. students of chemistry and biology. Lecturer in Physical Chemistry to undergraduate and graduate students of chemistry, chemical technology, pharmacy, and biology and chemistry. Seminar teacher to undergraduate and graduate students taking courses in Physical Chemistry. Laboratory teacher in Physical chemistry to undergraduate and graduate students taking courses in Physical Chemistry. Lecturer and seminar in Elements of Physical Chemistry on the professional study of chemical technology. Laboratory teacher in Physical Chemistry of Electrolyte Solutions to graduate students of chemistry.
Authorship of university/faculty textbooks in the field of the course	J. Radošević, V. Sokol, R. Tomaš, P. Bošković, Laboratory Experiments in Physical Chemistry, University of Split, Split, 2012 (under review)
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1) N. Galić, N. Burić, R. Tomaš, L. Frkanec, V. Tomišić, Synthesis and Cation Binding Properties of Fluorescent Calix[4]Arene Derivatives Bearing Tryptophan Units at the Lower Rim, *Supramolecular Chemistry*, **23**(5) (2011), 389-397. 2) V. Sokol, R. Tomaš, P. Bošković, Ion-Association Reaction of Rb^+ and Br^- in 2-Methylpropan-2-ol + Water Mixtures, *Acta Chimica Slovenica*, **59**(4) (2012) 920-926. 3) A. Bald, Z. Kinart, R. Tomaš, Volumetric studies of aqueous solutions of monosodium salts of some aliphatic dicarboxylic

	acids at 298.15 K. A new method of data analysis, *Journal of Molecular Liquids*, **178**(2) (2013) 94-98. 4) R. Tomaš, V. Sokol, P. Bošković, A. Turudić, Transference Numbers of Sodium Chloride in Formamide + Water Mixtures at 298.15 K from Potential Difference Measurements, *International Journal of Electrochemical Science*, **8**(6) (2013) 7669-7679. 5) A. Bald, Z. Kinart, A. Wypych-Stasiewicz, R. Tomaš, Conductance studies of NaCl, KCl, NaBr, KBr, Bu_4NBr, and $NaBPh_4$ in water + 2-methoxyethanol at 298.15 K, *Journal of Molecular Liquids*, **182**(6) (2013) 14-24.
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)	2008-2013, Ministry of Science, Republic of Croatia, research project: "Properties of electrolytes in mixed solvents".
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?	
PRIZES AND AWARDS, STUDENT EVALUATION	
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)	Results of student evaluation are positive in the last five years.

First and last name and title of teacher	**PhD, Ivica Blažević, Assistant Professor**
The course he/she teaches in the proposed study programme	Organic Chemistry
GENERAL INFORMATION ON COURSE TEACHER	
Address	N. Tesle 10/V, HR-21000 Split
Telephone number	021 323 434
E-mail address	blazevic@ktf-split.hr
Personal web page	
Year of birth	1974
Scientist ID	267194
Research or art rank, and date of last rank appointment	Research assistant, 17.5.2010.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Assistant professor, 1.12.2012.
Area and field of election into research or art rank	Natural sciences; field: Chemistry

INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Chemistry and Technology, University of Split
Date of employment	1.12.2003.
Name of position (professor, researcher, associate teacher, etc.)	Assistant professor
Field of research	Chemistry
Function	
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	University of Zagreb, Faculty of Sciences
Place	Zagreb
Date	23.10.2009.
INFORMATION ON ADDITIONAL TRAINING	
Year	
Place	
Institution	
Field of training	
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
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	German, 3
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
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)	Organic Chemistry (undergraduate study of Chemical Technology), Organic Chemistry I (undergraduate study of Chemistry), Organic Analysis (graduate study of Chemistry), study programmes of the Faculty of Chemistry and Technology Split
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)	1. **Ivica Blažević,** Gina Rosalinda De Nicola, Sabine Montaut, Patrick Rollin. Glucosinolates in Two Endemic Plants of the *Aurinia* Genus and their Chemotaxonomic Significance. Natural Product Communications. 8 (2013) 1463-1466. 2. **Ivica Blažević**, Franko Burčul, Mirko Ruščić, Josip Mastelić. Glucosinolates, volatile constituents, and acetylcholinesterase inhibitory activity of *Alyssoides utriculata*. Chemistry of natural compounds. 49 (2013) 374-378. 3. **Ivica Blažević,** Ani Radonić, Mirjana Skočibušić, Gina R. De Nicola, Sabine Montaut, Renato Iori, Patrick Rollin, Josip Mastelić, Marina Zekić, and Ana Maravić. Glucosinolate profiling and antimicrobial screening of *Aurinia leucadea* (Brassicaceae). Chemistry & biodiversity. **8** (2011) 2310-2321. 4. **Ivica Blažević,** Ani Radonić, Josip Mastelić, Marina Zekić, Mirjana Skočibušić, Ana Maravić.

	Glucosinolates, glycosidically bound volatiles and antimicrobial activity of *Aurinia sinuata* (Brassicaceae). Food chemistry. **121** (2010) 1020-1028. 5. Other published papers
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 MZOS „Essential oils and aromas – biologically active compounds and their modifications“ Bilateral French-Croatia 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?-pedagoške kompetencije?	
PRIZES AND AWARDS, STUDENT EVALUATION	
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 teacher	**PhD, Nenad Kuzmanić, Full Professor**
The course he/she teaches in the proposed study programme	Transport Phenomena
GENERAL INFORMATION ON COURSE TEACHER	
Address	Teslina 10/V, 21000 Split
Telephone number	++385 21 329 468
E-mail address	kuzmanic@ktf-split.hr
Personal web page	
Year of birth	1959.
Scientist ID	120556
Research or art rank, and date of last rank appointment	Scientific Adviser- March 27th, 2007
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Full Professor - June 17th, 2012
Area and field of election into research or art rank	Technical Sciences, Chemical Engineering
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Chemistry and Technology, University of Split
Date of employment	December 1st, 1984
Name of position (professor,	Full Professor

researcher, associate teacher, etc.)	
Field of research	Mechanical, thermal and separation processes
Function	Head of Department of chemical engineering
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty of Chemistry and Technology, University of Split
Place	Split
Date	December 26th, 1995
INFORMATION ON ADDITIONAL TRAINING	
Year	1991.-1992.
Place	Torino, Italy
Institution	Politecnico di Torino, Dipartimento di Scienza dei Materiali e Ingegneria Chimica, Torino, Italy
Field of training	Solid suspension in mixing vessels; wall sampling of solid suspension from mixing tank
Year	2000.-2001.
Place	Rolla, Missouri, USA
Institution	University of Missouri - Rolla, Department of Chemical Engineering, Rolla , Missouri, USA
Field of training	Mixing in multiphase systems
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 (4)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	Italian (5)
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)	Material and energy balances – undergraduated study of Chemical Technology Introduction to chemical engineering– undergraduated study of Chemistry Mechanical and heating operations – graduated study of Chemical Technology (orientation: Materials) Environmental engineering - graduated study of Chemical Technology (orientation: Environmental protection)
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)	A. Kaćunić, M. Akrap, **N. Kuzmanić**, Effect of impeller position in a batch cooling crystallizer on the growth of borax decahydrate crystals, Chemical engineering research & design. 91 (2013) 2; 274-285. M. Akrap, **N. Kuzmanić**, J. Prlić Kardum, Impeller geometry effect on crystallization kinetics of borax decahydrate in a batch cooling crystallizer, Chemical engineering research & design. 90 (2012) 6; 793-802. I. Smoljko, S. Gudić, **N. Kuzmanić**, M. Kliškić, Electrochemical properties of aluminium anodes for Al/air batteries with aqueous sodium chloride electrolyte, Journal of applied electrochemistry. 42 (2012) 11; 969-977. M Akrap, **N. Kuzmanić**, J. Prlić-Kardum, Effect of mixing on the crystal size distribution of borax decahydrate in a batch cooling crystallizer, Journal of crystal growth. 312 (2010) , 24; 3603-3608. **N. Kuzmanić**, R. Žanetić, M. Akrap, Impact of floating

	suspended solids on the homogenisation of the liquid phase in dual-impeller agitated vessel, Chemical Engineering & Processing. 47 (2008) 4; 663-669.
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 011-0112247-2241: Optimization of mixing and transport phenomena in solid-liquid agitated systems (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?	
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	University of Missouri - Rolla Award, Rolla, Missouri, USA
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	**Ph.D. Mladen Miloš, Full Professor**
The course he/she teaches in the proposed study programme	Biochemistry
GENERAL INFORMATION ON COURSE TEACHER	
Address	Teslina 10, 21000 Split
Telephone number	0977410899
E-mail address	milos@ktf-split.hr
Personal web page	http://tkojetko.irb.hr/znanstvenikDetalji.php?sifznan=6547
Year of birth	1956
Scientist ID	211625
Research or art rank, and date of last rank appointment	Scientific advisor (2010)
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Full professor (2010)
Area and field of election into research or art rank	Sciences, chemistry, Biochemistry and medicinam chemistry
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of chemistry end technology
Date of employment	1993
Name of position (professor, researcher, associate teacher, etc.)	professor
Field of research	Biochemistry
Function	Head of Department of biochemistry

INFORMATION ON EDUCATION – Highest degree earned	
Degree	Ph.D.
Institution	Faculty of Sciences
Place	Geneva
Date	1989
INFORMATION ON ADDITIONAL TRAINING	
Year	2002
Place	Marseille, France
Institution	Unicerity of Provence
Field of training	Natural products
MOTHER TONGUE AND FOREIGN LANGUAGES	
Mother tongue	Croatian
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	French (5)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	English (2)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
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)	Introduction in biochemistry, Biochemistry I and II, Physical biochemistry
Authorship of university/faculty textbooks in the field of the course	Lectures of Basic biochemistry
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. **M. Miloš**, D. Makota, Investigation of antioxidant synergisms and antagonisms among thymol, carvacrol, thymoquinone and p-cymene in a model system using the Briggs–Rauscher oscillating reaction. *Food Chemistry*, **131** (2012) 1; 296-299. 2. K. Carović-Stanko, Z. Liber, O. Politeo, F. Strikić, I. Kolak, **M. Miloš**, Z. Šatović, Molecular and chemical characterization of the most widespread Ocimum species. Plant *systematics and evolution*, **294** (2011) 3/4; 253-262 3. Z. Liber, K. Carović-Stanko, O. Politeo, F. Strikić, I. Kolak, **M. Milos**, Z. Satovic, Chemical characterization and genetic relationships among Ocimum basilicum L. cultivars. *Chemistry & biodiversity*. **8** (2011) 11; 1978-1989. 4. O. Politeo, M. Skočibušić, A. Maravić, M. Ruščić, **M. Miloš**, Chemical Composition and Antimicrobial Activity of the Essential Oil of Endemic Dalmatian Black Pine (Pinus nigra ssp. dalmatica). *Chemistry & biodiversity*. **8** (2011) 3; 540-547. 5. K. Carović-Stanko, S. Orlić, O. Politeo, F. Strikić, I. Kolak, **M. Miloš**, Z. Šatović, Composition and Antibacterial Activities of Essential Oils of Seven Ocimum Taxa. *Food Chemistry*. **119** (2010) 1; 196-201.
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)	Antioxidative constituents and cholinesterase inhibitors from aromatic herbs
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?	University undergraduate chemistry Graduate study in chemistry Integrated undergraduate and graduate Pharmacy Professional Study of Chemical Technology
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	Award of Faculty of chemistry and technology
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	**PhD, Marija Ćosić (Akrap), Assistant Professor**
The course he/she teaches in the proposed study programme	Unit Operations
GENERAL INFORMATION ON COURSE TEACHER	
Address	Teslina 10/V
Telephone number	021/329-453
E-mail address	akrap@ktf-split.hr
Personal web page	
Year of birth	1977
Scientist ID	267161
Research or art rank, and date of last rank appointment	scientific associate - 07.12.2010.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Assistant professor - 31.03.2011.
Area and field of election into research or art rank	Technical sciences, chemical engineering
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	University of Split, Faculty of Chemistry and Technology
Date of employment	01.09.2004.
Name of position (professor, researcher, associate teacher, etc.)	assistant professor
Field of research	Mechanical, thermal and separation processes
Function	
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Ph. D.
Institution	University of Split, Faculty of Chemistry and Technology
Place	Split
Date	24.06.2010.
INFORMATION ON ADDITIONAL TRAINING	

Year	2010.
Place	Zagreb
Institution	Faculty of the Chemical Engineering and Technology
Field of training	Processes of seeded crystallization
Year	2005.
Place	Rome
Institution	L'Universita degli Studi di Roma ″La Sapienza″
Field of training	Chemical engineering
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 4
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)	Unit operations - undergraduate study of Chemical Technology Material and energy balances –undergraduate study of Chemical Technology Mechanical and Heat Transfer Operations - graduate study of Chemical Technology (orientation: Materials)
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)	A. Kaćunić, **M. Akrap**, N. Kuzmanić, Effect of impeller position in a batch cooling crystallizer on the growth of borax decahydrate crystals, *Chemical engineering research & design*. 91, 2; (2013) , 274-285. **M. Akrap**, N. Kuzmanić, J. Prlić Kardum, Impeller geometry effect on crystallization kinetics of borax decahydrate in a batch cooling crystallizer, *Chemical engineering research & design*. 90, 6; (2012), 793-802 **M. Akrap**, N. Kuzmanić, J. Prlić Kardum, Effect of mixing on the crystal size distribution of borax decahydrate in a batch cooling crystallizer, *Journal of crystal growth*, 312, 24 (2010); 3603-3608. **M. Akrap**, D. Bralić, N. Kuzmanić, In-line bulk concentration measurement in batch cooling crystallization of borax decahydrate, *Proceedings of the 13th Ružićka Days ″ Today science - tomorrow industry″*, Osijek, 2011, 115-125 **M. Akrap**, N. Kuzmanić, J. Prlić-Kardum, Jasna; E. Kessler, Effect of off-bottom impeller clearance on nucleation and crystal growth of borax decahydrate in batch cooling crystallizer, *13th European Conference on Mixing -: Proceedings*, London, IChemE, 2009, 1-9.
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 011-0112247-2241: Optimization of mixing and transport phenomena in solid-liquid agitated systems
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?	
PRIZES AND AWARDS, STUDENT EVALUATION	
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)	Evaluation organizer: University of Split Courses: Unit operations: Av. Grade: 4.5 Material and energy balances: Av. Grade: 4.5 Mechanical and heat transfer operations: Av. Grade: 5.0

First and last name and title of teacher	**PhD, Vanja Martinac, Full Professor**
The course he/she teaches in the proposed study programme	Thermodynamics Mineral Raw Materials from Seawater
GENERAL INFORMATION ON COURSE TEACHER	
Address	Teslina 10 / V, 21000 Split
Telephone number	021/ 329-420
E-mail address	martinac@ktf-split.hr
Personal web page	http://tkojetko.irb.hr/znanstvenikDetalji.php?sifznan=3492&podaci=dokumenti
Year of birth	1959.
Scientist ID	119805
Research or art rank, and date of last rank appointment	Senior Research Scientist – 21. 4. 2006.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Full professor (with tenure) – 25. 7. 2011.
Area and field of election into research or art rank	Technical Sciences, Chemical Engineering
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Chemistry and Technology
Date of employment	4. 6. 1984.
Name of position (professor, researcher, associate teacher, etc.)	Full professor (with tenure) in Department of Thermodynamics
Field of research	Research and Highly Education
Function	Head of Department of Thermodynamics (1998.-)
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Ph. D. of Technical Sciences in the Field of Chemical Engineering
Institution	Faculty of Technology University of Split
Place	Split
Date	08th July 1994.
INFORMATION ON ADDITIONAL TRAINING	
Year	
Place	

Institution	
Field of training	
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 (3)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
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)	Technical Thermodynamics (base level) on: - Undergraduated University Study Programm in Chemical Technology from 1996. to 2005., - Professional Study of Chemical Technology (Study Orientation: Chemical Technology and Food Technology) 2001. and 2002. Thermodynamics (base level) on: - Undergraduated University Study Programm in Chemical Technology, Study Orientation: Chemistry and Technology of Mediterranean plants from 2002. to 2005., - Academic Undergraduate Study of Chemical Technology, Study Orientation: Chemical Engineering and Enviromental Protection from 2005. Thermodynamics and Thermotechnics (base level) on: - Professional Study of Chemical Technology (Study Orientation: Process Technology and Food Technology) from 2002. to 2005., - Professional Study of Chemical Technology (Study Orientation: Chemical Technology and Materials, and Food Technology) from 2005. - Professional Study of Food Technology on Polytechnic of Knin “Marko Marulić” from 2005. to 2012. Thermodynamics of Real Processes (base level) on: - Undergraduated University Study Programm in Chemical Technology, Study Orientation: Chemical Technology Processes from 1998. to 2006. - Academic Graduate Study of Chemical Technology, Study Orientation: Materials and Enviromental Protection from 2008. Chemical Engineering Thermodynamics (advanced level) on: - Postgraduated Study in “Chemical Engineering in Materials Development ”, acad. year 2004./05. - Postgraduated Doctoral Study in “Chemical Engineering in Materials Development and Enviromental Protection”, acad. year 2008./09. and 2012./13. Marine and Submarine Raw Materials (base level) on: - Undergraduated University Study Programm in Chemical Technology, Study Orientation: Technology of Sea and Mediterranean plants from 1993. to 2002., - Undergraduated University Study Programm in Chemical Technology, Study Orientation: Chemistry and Technology of Mediterranean plants from 2002. to 2005., - Academic Graduate Study of Chemical Technology, Study Orientation:

	Materials from 2008. god. Marine and Submarine Raw Materials (advanced level) on - Postgraduated Study in “Engineering Chemistry” acad. year 1994./95. and 2000./01. Activated Sintering of Magnesium Oxide (advanced level) on - Postgraduated Study in “Chemical Engineering in Materials Development”, acad. year 2004./05. Magnesium Oxide from Seawater (advanced level) on: - Postgraduated Study in “Chemical Engineering in Materials Development”, acad. year 2004./05. - Postgraduated Doctoral Study in “Chemical Engineering in Materials Development and Enviromental Protection”, acad. year 2008./09. and 2012./13. Marine Raw Materials in Chemical Industry and Medicine (advanced level) Postgraduate Study in “Applied Marine Science” (collaboration with University Centre for Marine Studies University of Split and Department of Aquaculture University of Dubrovnik), acad. year 2006./07. Seawater as Sources of Mineral Raw Materials (base level) Academic Undergraduate Study of Chemical Technology, Study Orientation: Chemical Engineering from 2005.
Authorship of university/faculty textbooks in the field of the course	N. Petric, I. Vojnović, V. Martinac, Technical Thermodynamics, University book, (in Croatian), 1st Ed., Hinus, Zagreb 1999. N. Petric, I. Vojnović, V. Martinac, Technical Thermodynamics, University book, (in Croatian), 2nd Ed., Faculty of Chemistry and Technology, on line (2007-01-09), Split, 2007. V. Martinac, Thermodynamics and Thermotechnics, (Handbook-Formulas and Tables), (in Croatian), Faculty of Chemistry and Technology, on line (2008-12-09), Split, 2008. N. Petric, V. Martinac, Chemical Engineering Thermodynamics, (Thermodynamics of Real Processes), Internal faculty textbook, (in Croatian), Faculty of Technology, Split, 1998. V. Martinac, Chemical Engineering Thermodynamics, Internal faculty textbook, (in Croatian), Faculty of Chemistry and Technology, Split, 2008. V. Martinac, J. Jakić, Thermodynamics (Laboratory Exercises), on line (2011-11-15), Internal mimeographed notes, (in Croatian), Faculty of Chemistry and Technology, Split, 2010. V. Martinac, Magnesium Oxide from Seawater, (on line 2010-12-13), University handbook, (in Croatian), Faculty of Chemistry and Technology, Split, 2010. V. Martinac, M. Labor, Seawater as Sources of Mineral Raw Materials, (on line 2011-01-18), Laboratory exercises, Internal mimeographed notes, (in Croatian), Faculty of Chemistry and Technology, Split, 2011.
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	M. Labor, V. Martinac, N. Petric, B_2O_3 Content in the Sintered Magnesium Oxide Obtained from Seawater, Ind. J Chem. Technol., 20 (2013) 276-281. M. Labor, M. Tolo, V. Martinac, J. Jakić, The MgO (80% precipitation) from Seawater, Proceedings of the International Conference on Materials, Processes, Friction and Wear, MATRIB 2013, Ž. Alar, S. Jakovljević, S. Šolić (Eds.), Zagreb, Croatian Society for Materials and Tribology, 2013., 248-254. V. Martinac, Effect of TiO_2 Addition on the Sintering Process of Magnesium Oxide from Seawater, Sintering of Ceramics - New Emerging Techiques, A. Lakshmanan (Ed.), Rijeka, InTech, 2012., 309-322. V. Martinac, T. Maleš, M. Labor, Activated Sintering of Magnesium Oxide from Seawater with TiO_2 Addition, Metallic and Nonmetalic Materials: Production, Properties, Application, Proceedings of the 8th Scientific-Research Symposium with International Participation Metallic and

	Nonmetallic Materials, S. Muhamedagić (Ed.), Zenica, University of Zenica, Faculty of Metallurgy and Materials Science, 2010., 231-236. V. Martinac, J. Jakić, M. Miroslav, Effect of TiO_2 on Sintering of Magnesium Oxide Obtained from Seawater, Proceedings of the 11st International Conference on Materials, Processes, Friction and Wear, K. Grilec, G. Marić (Eds.), Zagreb, Croatian Society for Materials and Tribology, 2009., 129-135.
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 011-0112247-2250 “Acitivated Sintering of Magnesium Oxide“, Ministry of Science, Education and Sports of the Republic of Croatia, (2007.-2013.); Principal Investigator: Prof. Ph. D. V. Martinac
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?	
PRIZES AND AWARDS, STUDENT EVALUATION	
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)	Evaluation organizer: University of Split Thermodynamics: Av. Grade: > 3.0 (based on four academic years) Thermodynamics and Thermotechnics: Av. Grade: > 3.5 (based on four academic years) Thermodynamics of Real Processes: Av. Grade: > 4.7 (based on four academic years) Seawater as Sources of Mineral Raw Materials: Av. Grade: 5.0 (based on two academic years)

First and last name and title of teacher	**Renato Stipišić, Lecturer**
The course he/she teaches in the proposed study programme	Measuring end control technique
GENERAL INFORMATION ON COURSE TEACHER	
Address	Dobrilina 13, Split
Telephone number	098595766

E-mail address	stipisic@ktf-split.hr
Personal web page	
Year of birth	1965
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
Area and field of election into research or art rank	
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	University of Split, Faculty of Chemistry and Technology
Date of employment	01.07.1992.
Name of position (professor, researcher, associate teacher, etc.)	Lecturer
Field of research	Chemical engineering
Function	
INFORMATION ON EDUCATION – Highest degree earned	
Degree	
Institution	
Place	
Date	
INFORMATION ON ADDITIONAL TRAINING	
Year	1998.
Place	Crikvenica
Institution	BVQI
Field of training	EMS Auditor Training Course (IRCA ISO 14001)
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 (3)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	Slovenian (4)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
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)	Measuring and control technique, Professional study: Chemical technology Unit operations, Professional study: Chemical technology Operatinos and equipment in food industy, Professional study. Food technology
Authorship of university/faculty textbooks in the field of the course	R. Žanetić, R. Stipišić, Mjerni pretvornici u procesnoj industriji, Kemijsko-tehnološki fakultet, 2005. R. Stipišić, Operacije odvajanja u zaštiti okoliša, Kemijsko-tehnološki fakultet, 2011.
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	R. Stipišić, N. Cinoti, S. Svilović, R. Žanetić, D. Rušić,"Projektiranje kotlastog fotobioreaktora za uzgoj morske alge Nannochloropsis sp.", XII. Ružičkini dani, Vukovar 2008. R. Stipišić, D. Rušić, N. Cinoti, S. Svilović, R. Žanetić, "Determination of light intensity in marine algae cultivation photobioreactor", 13th Ružička Days "Today science-tomorrow industry", Vukovar, Hrvatska, 16.-17. 09. 2010.

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?	
PRIZES AND AWARDS, STUDENT EVALUATION	
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 teacher	**PhD, Branka Andričić, Full Professor**
The course he/she teaches in the proposed study programme	Basic Biotechnology
GENERAL INFORMATION ON COURSE TEACHER	
Address	Teslina 10/V, 21000 Split
Telephone number	++385 21 329 469
E-mail address	branka@ktf-split.hr
Personal web page	
Year of birth	1965
Scientist ID	188492
Research or art rank, and date of last rank appointment	Senior Research Scientist, November 14th, 2008
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Full professor, December 24th, 2010
Area and field of election into research or art rank	Technical Sciences, Chemical Engineering
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Chemistry and Technology, University of Split
Date of employment	February 19th, 1991
Name of position (professor, researcher, associate teacher, etc.)	Full Professor
Field of research	Chemical Engineering in Materials Development
Function	Vice dean
INFORMATION ON EDUCATION – Highest degree earned	

Degree	PhD
Institution	Faculty of Chemistry and Technology, University of Split
Place	Split
Date	December 19th, 2001
INFORMATION ON ADDITIONAL TRAINING	
Year	
Place	
Institution	
Field of training	
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 (4)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	Italian (2)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
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)	1. Biotechnological Processes - graduated study of Chemical Technology (Mediterranean Cultures)
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)	B. Andričić, T. Kovačić, M. Čagalj, Transesterifikacija otpadnih jestivih ulja u svrhu proizvodnje biodizela, *International Conference on Materials and Tribology, MATRIB '08, Vela Luka, 26-28. 06. 2008.*
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?	
PRIZES AND AWARDS, STUDENT EVALUATION	
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	Evaluation organizer: University of Split Biotechnological Processes: Av. Grade: > 4.5 (based on four academic years)

grading scale and course evaluated)	

First and last name and title of teacher	**PhD, Nataša Stipanelov Vrandečić, Associated Professor**
The course he/she teaches in the proposed study programme	Food Packaging
GENERAL INFORMATION ON COURSE TEACHER	
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	http://tkojetko.irb.hr/znanstvenikDetalji.php?sifznan=7463
Year of birth	1966.
Scientist ID	226264
Research or art rank, and date of last rank appointment	Senior Research Scientist, 2010-4-27
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Associated Professor, 2013-7-16
Area and field of election into research or art rank	Area: Technical Sciences; Field: Chemical Engineering
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Chemistry and Technology
Date of employment	1995-06-01
Name of position (professor, researcher, associate teacher, etc.)	Associated Professor
Field of research	Chemical Engineering in Materials Development
Function	Vice dean
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Dr. Sc.
Institution	Faculty of Chemistry and Technology
Place	Split
Date	2003-3-28
INFORMATION ON ADDITIONAL TRAINING	
Year	
Place	
Institution	
Field of training	
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 (4)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	French (2)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
COMPETENCES FOR THE COURSE	
Earlier experience as course teacher of similar courses (name title of course, study programme	Packaging, Professional Study of Chemical Technology; Study Orientations: Food Technology Packaging, Academic Graduate Study of Chemical

where it is/was offered, and level of study programme)	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**, I. Klarić, Thermal degradation of poly(vinyl chloride)/poly(ethylene oxide) blends: Thermogravimetric analysis, Polymer Degradation and Stability 98 (2013) 1738-1743 **N. Stipanelov Vrandečić**, M. Erceg, M. Jakić and I. Klarić, Kinetic analysis of thermal degradation of poly(ethylene glycol) and poly(ethylene oxide)s of different molecular weight, Thermochimica Acta 498 (2010) 71-80 M. Jakić, **N. Stipanelov Vrandečić**, I. Klarić, Utjecaj poli(etilen-glikola) na toplinsku razgradnju mješavina poli(vinil-klorid)/poli(etilen-oksid) International Conference on Materials, Tribology, Recycling - MATRIB 2013, Zagreb: Hrvatsko društvo za materijale i tribologiju, Vela Luka, 2013. str. 192-203 M. Erceg, M. Omazić, **N. Stipanelov Vrandečić**, I. Banovac: Preparation and characterization of poly(ethylene oxide)/lithium montmorillonite composites, 15th European Conference On Composite Materials, Venecija, Italija, 2012. **N. Stipanelov Vrandečić**, M. Jakić, I. Klarić, S. Muslim: Dinamička termogravimetrijska razgradnja mješavina PVC/PEO, 13th Ružička Days; Osijek, Prehrambeno-tehnološki fakultet Osijek i Hrvatsko društvo kemijskih inženjera i tehnologa (HDKI), 2011., str. 175-185
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?-pedagoške kompetencije?	
PRIZES AND AWARDS, STUDENT EVALUATION	
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 polymeic technology (2001-12-4).
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)	Evaluation organizer: University of Split Packaging: Avarage Grade: 4.5

First and last name and title of teacher	**PhD, Marina Trgo, Associate Professor**
The course he/she teaches in the proposed study programme	Water technology
GENERAL INFORMATION ON COURSE TEACHER	
Address	Teslina 10/V
Telephone number	021329454
E-mail address	mtrgo@ktf-split.hr
Personal web page	https://tkojetko.irb.hr/znanstvenikDetalji.php?sifznan=6917
Year of birth	1972
Scientist ID	218460
Research or art rank, and date of last rank appointment	Scientific adviser, 9th October 2012
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Associate professor, 22nd November 2009
Area and field of election into research or art rank	Technical sciences, chemical engineering
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Chemistry and Technology, University of Split
Date of employment	1st March 2006
Name of position (professor, researcher, associate teacher, etc.)	Associate professor, higher scientific researcher,
Field of research	Lecturer and research work within the field of chemical and environmental engineering
Function	
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty of Chemistry and Technology, University of Split
Place	Split
Date	17th December 2003
INFORMATION ON ADDITIONAL TRAINING	
Year	
Place	
Institution	
Field of training	
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, excellent
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)	• Industry and environment (2001 - today), lectures, exercises , Faculty of Chemistry and Technology, University of Split • Water in industry (2004 - today), lectures, seminars, exercises , Faculty of Chemistry and Technology, University of Split • Water technology (2006 - today), lectures, seminars, exercises , Faculty of Chemistry and Technology, University of Split • Water technology (2006 - 2010), lectures, exercises, University of Applied Sciences, Knin • Chemistry in industry (2007 - today), lectures, Faculty of Science, University of Split

	• Natural zeolites in environmental protection (2010), lectures, Faculty of Chemistry and Technology, University of Split • Wastewater treatment (2004 - 2006), lectures, exercises, Faculty of Chemistry and Technology, University of Split • Industrial wastewaters (2007) lectures, seminars, exercises, Faculty of Chemistry and Technology, University of Split.
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)	1. 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. 2. 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. 3. N. Vukojević Medvidović, S. Maletić, J. Perić, **M. Trgo**, M. Ugrina, Zinc removal from aqueous solutions by precipitation and coagulation/ flocculation, Proceedings 13th Ružićka Days Today science - tomorrow industry / D. Šubarić (ur.), Osijek, Hrvatsko društvo kemijskih inženjera i tehnologa, 2011, str. 512-519. 4. G. Slavić, **M. Trgo**, D. Rušić, J. Perić, N. Vukojević Medvidović, Application of the Yoon-Nelson model and the reactor theory for packed beds on zinc uptake on clinoptilolite, Proceedings of the 3rd Slovenian-Croatian Symposium on Zeolites, T. Antonić Jelić, N. Zabukovec Logar (ur.), Zagreb, Croatian Zeolite Association, 2010, str. 85-88. 5. L. Ćurković, **M. Trgo**, A. Rastovčan Mioč, N. Vukojević Medvidović, Removal of Cu and Pb Ions from Aqueous Solutions by Electric Furnace Slag - Kinetic and Thermodynamic Aspects, Indian Journal of Chemical Technology, 16 (2009) 1, 84-88.
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)	1. Technology transfer infrastructure in the Croatian Adriatic region -„TTAdria", IPA2007/HR/16IPO/001-040516, University of Split, 2013 -, scout. 2. Development of new Fe(III) modified natural zeolite for environmental application, 2008 - 2010, project leader of bilateral Croatian - Serbian scientific project. 3. Natural zeolites in water protection, Ministry of Science, Education and Sport of Republic of Croatia, Zagreb, 2007-2013, researcher (project leader: PhD Jelena Perić, full professor).
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?	
PRIZES AND AWARDS, STUDENT EVALUATION	
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)	

First and last name and title of teacher	**PhD, Ivica Ljubenkov, Assistant Professor**
The course he/she teaches in the proposed study programme	Olives processing technologies
GENERAL INFORMATION ON COURSE TEACHER	
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, 03.06.2011.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Assistant professor (13.07.2011)
Area and field of election into research or art rank	Chemistry, Analytical chemistry
INFORMATION ON CURRENT EMPLOYMENT	
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	
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Dr.sc.
Institution	Faculty of science, University of Zagreb
Place	Zagreb
Date	03.03.2000.
INFORMATION ON ADDITIONAL TRAINING	
Year	
Place	
Institution	
Field of training	
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 (4)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	

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)	Olive processing, graduate level KTD202 (2013/2014) Olive processing, pregraduate level KTF213 (2013/2014)
Authorship of university/faculty textbooks in the field of the course	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)	1. Koprivnjak, O., Škevin, D., Valić, S., Majetić, V., Petričević, S., Ljubenkov, I. The antioxidant capacity and oxidative stability of virgin olive oil enriched with phospholipids. *Food Chemistry*. 111 (2008); 1; 121-126. 2. Ljubenkov, I. Olive oil: Technology, Chemistry and Health MATH/CHEM/COMP 2009: The Dubrovnik International Course & Conference on the Interfaces among Mathematics, Chemisty and Computer Sciences. Inter-University Centre, Dubrovnik, Croatia, June 8-13, 48. ISBN 978-953-6954-513. 3. Šimić, A., Graovac, A., Ljubenkov, I. Monitoring Dynamics of Croatian Olive Fields and Vineyards using Remote Sensing Applications; MATH/CHEM/COMP 2009: The Dubrovnik International Course & Conference on the Interfaces among Mathematics, Chemisty and Computer Sciences. Inter-University Centre, Dubrovnik, Croatia, June 8-13, 74. ISBN 978-953-6954-51-3 4. Generalić, I.; Agić, P.; Skroza, D.; Ljubenkov, I.; Matek Sarić, M.; Režić Dereani, V. Antioxidant properties of Oblica cv olive oil phenolics, *Book of Abstracts of the 7th International Congress of food technologists, biotechnologists, and nutritionists* / Medić, Helga (ur.). Zagreb : BARIS d.o.o., Zaprešić, 2011. 116-116 (poster, međunarodna recenzija, sažetak, znanstveni). 5. Ljubenkov, I.; Skroza, D.; Generalić, I.; Konta, I.; Čagalj, Ž.; Veličković, V.; Petričević, S., Physical, chemical and sensory properties of Dalmatian olive oils, *Book of Abstracts of the 7th International Congress of food technologists, biotechnologists, and nutritionists* / Medić, Helga (ur.). Zagreb: BARIS d.o.o., Zaprešić, 2011. 236-236.
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)	1. UKF projekt *„Monitoring dynamics of Croatian olive fields using remote sensing application*“, (09MUKF02), Primary investigator: Anita Šimić, 2009. 2. Programme of support the scientific research projects in agriculture of Split-Dalmatia County for 2013: „Enzymes of lipoxygenase parhway in indigenous varieties of olives“, 10.12.2013., Klasa: 402-01/13-01/1655, URBROJ: 2181/1-05-00-02/02-13-0003.
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?	
PRIZES AND AWARDS, STUDENT EVALUATION	

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 teacher	**PhD, Vida Šimat, Assistant Professor**
The course he/she teaches in the proposed study programme	Seafood processing technology
GENERAL INFORMATION ON COURSE TEACHER	
Address	Livanjska 5/3, 21000 Split
Telephone number	+385 21 558 254
E-mail address	vida@unist.hr
Personal web page	http://more.unist.hr/Organizacija/Imenik/tabid/633/agentType/View/PropertyID/1184/Default.aspx
Year of birth	1980
Scientist ID	288561
Research or art rank, and date of last rank appointment	Research associate – September 16th, 2011.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Assistant professor – December 3rd, 2011.
Area and field of election into research or art rank	Biotechnical Sciences, Food Technology
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	University of Split, Department of Marine Studies
Date of employment	September 1st, 2006.
Name of position (professor, researcher, associate teacher, etc.)	Assistant professor
Field of research	Food quality and safety
Function	-
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty of Food Technology and Biotechnology, University of Zagreb
Place	Zagreb
Date	December 22nd, 2010.
INFORMATION ON ADDITIONAL TRAINING	
Year	2008
Place	Zagreb, Croatia
Institution	TAIEX
Field of training	Microbiological requirements for food
Year	2009
Place	Lyngby, Denmark
Institution	National Institute of Aquatic Resources, Technical University of Denmark
Field of training	Biogenic amines in seafood (+HPLC training)
Year	2009
Place	Copenhagen, Denmark
Institution	Seafood Circle i DTUAqua, Technical University of Denmark.

Field of training	Seafood and health
Year	2011
Place	Belgrade, Srbia
Institution	Faculty of Chemistry, University of Belgrade
Field of training	Food Safety and Health Effects of Food
Year	2013
Place	Zagreb, Croatia
Institution	TAIEX
Field of training	Labelling requirements for fisheries and aquaculture products
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)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	Italian (5)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	Spanish (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)	At undergraduate and graduate levels of the Study "Marine Fisheries", graduate study “Mediterranean Food Technology” and the Inter-university PhD study, "Applied Marine Sciences” at University of Split. Undergraduate Marine fishery - Preservation and processing of seafood (lectures and exercises) - Hygiene in the seafood industry (lectures, exercises, training) - Quality assessment of seafood products (lectures, exercises, training) Graduate Study of Marine Fisheries - Technology chilling and freezing of marine organisms (lectures and exercises) - Preservation of fish salting, drying and smoking (lectures and exercises) -Seafood products (lectures and exercises) Doctoral study -Technology and processing of seafood products
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)	1. T. Bogdanović, I. Ujević, M. Sedak, E. Listeš, **V. Šimat**, S. Petričević, V. Poljak, Vedran. 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 2. 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 3. 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. 4. **V. Šim**at, 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. 5. **V. Šimat**, P. Dalgaard, Use of small diameter column particles to enhance HPLC determination of histamine and other biogenic amines in seafood. LWT - Food Science and Technology. 44 (2) (2011) 399-406.
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	http://bib.irb.hr/lista-radova?autor=288561
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	1. Optimization of HPLC method for determination of histamine and other biogenic amine in seafood. 2009. 2. Impact of fishing and aquaculture on ecosystem of Adriatic, 2007-2013. 3. Hyperspectral detector of parasite *Anisakis* spp. in fish fillets, 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?	
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	Award for young scientists, Biotechnical foundation, 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)	Evaluation organizer: University of Split Average grade for previously mentioned courses in 1012/2013 was >4.8

First and last name and title of teacher	**Ph.D. Igor Jerković, Full Professor**
The course he/she teaches in the proposed study programme	Processing technology of herbs and species
GENERAL INFORMATION ON COURSE TEACHER	
Address	N. Tesle 10/V, HR-21000 Split
Telephone number	021 329 436
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	Science adviser (25.10.2012.)
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Full professor (04.12.2013.)
Area and field of election into research or art rank	Natural sciences, Chemistry
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Chemistry and Technology, Split

Date of employment	01. 09. 1998.
Name of position (professor, researcher, associate teacher, etc.)	professor
Field of research	Chemistry
Function	Vice dean for science and international cooperation
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Ph. D.
Institution	Faculty of Chemistry and Technology, Split
Place	Split
Date	28. 05. 2004.
INFORMATION ON ADDITIONAL TRAINING	
Year	2005
Place	Rome
Institution	Dipartimento di Chimica dell' Università di Roma "La Sapineza
Field of training	Chemistry of natural organic compounds
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)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	Italian (3)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
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)	Chemistry and technology of aromatic plants and Aroma Chemistry (graduated study of Chemistry, Faculty of Chemistry and Technology Split)
Authorship of university/faculty textbooks in the field of the course	Aroma Chemistry, Faculty of Chemistry and Technology, Split, 2011.
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	I. Jerković, M. Marasović, Z. Marijanović, K. Hazler Pilepić, Ž. Maleš and M. Miloš, Chemical Composition of Hypericum richeri subsp. grisebachii Essential Oil from Croatia, Natural Product Communications 8 (2013) 231-233. I. Jerković, M. Šuste, Ž. Maleš and K. Hazler Pilepić, Essential Oil Composition of Prasium majus from Croatia, Natural Product Communications 7 (2012) 931-932.). I. Jerković, D. Gašo-Sokač, H. Pavlović, Z. Marijanović, M. Gugić, I. Petrović and S. Kovač, Volatile Organic Compounds from Centarium erythraea Rafn (Croatia) and Unlocking Antibacterial Activity of its Essential Oil, Molecules 17 (2012) 2058-2072. Other published papers
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 MZOS „Essential oils and aromas –biologically active compounds and their modifications“

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?	
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	Award for science achievements „Ruđer Bošković“, University of Split, 29. 11. 2013. Award for special achievements in scientific work and teaching, Faculty of Chemistry and Technology, Split, 22. 10. 2011 Award "Leopold (Lavoslav) Ružička" Croatian Chemical Society for remarkable results in the area of chemistry of natural compounds, Zagreb, 19. 10. 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)	Evaluation organizer: University of Split Chemistry and technology of aromatic plants: Average Grade: 4.9 Aroma Chemistry: Average Grade: 4.9

First and last name and title of teacher	**PhD, Maja Kliškić, Full Professor**
The course he/she teaches in the proposed study programme	Food Industry Waste Engineering
GENERAL INFORMATION ON COURSE TEACHER	
Address	Teslina 10/V, 21000 Split
Telephone number	++385 329 435
E-mail address	mkliskic@ktf-split.hr
Personal web page	
Year of birth	1953.
Scientist ID	119820
Research or art rank, and date of last rank appointment	Senior Research Scientist - April 21st, 2006.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Full Professor - July 25th, 2011.
Area and field of election into research or art rank	Technical Sciences, Chemical Engineering
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Chemistry and Technology, University of Split
Date of employment	December 1st, 1982.
Name of position (professor, researcher, associate teacher, etc.)	Full Professor - permanent position
Field of research	Analysis, synthesis and management of chemical processes
Function	Head of Department of Electrochemistry and Materials Protection
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty of Chemistry and Technology, University of Split
Place	Split
Date	October 28th, 1994.

INFORMATION ON ADDITIONAL TRAINING	
Year	
Place	
Institution	
Field of training	
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 (4)
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)	Solid Waste and Recycling - undergraduated study of Chemical Technology, graduated study of Chemical Technology (orientation: Environmental protection) Solid Waste and Recycling - professional study of Chemical Technology (orientation: Chemical Technology and Materials) Solid waste materials, their disposal and recycling - postgraduate doctoral study Chemical Engineering in Materials Development and Environmental Protection
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)	L. Vrsalović, S. Gudić, **M. Kliškić**, Salvia officinalis L. honey as corrosion inhibitor for CuNiFe alloy in sodium chloride solution. Indian journal of chemical technology. 19 (2012), 2; 96-102. L.Vrsalović, E. E. Oguzie**, M. Kliškić**, Gudić, Senka, Corrosion inhibition of CuNi10Fe alloy with phenolic acids, Chemical engineering communications. 198 (2011), 11; 1380-1393. L. Vrsalović, **M. Kliškić**, S. Gudić, I. Smoljko, Corrosion inhibition of Al-Mg alloy by gentisic acid. Indian journal of chemical technology. 17 (2010.), 2; 89-94. L. Vrsalović, **M. Kliškić**, S. Gudić, Application of Phenolic Acids in the Corrosion Protection of Al-0.8Mg Alloy in Chloride Solution International journal of electrochemical science, 4 (2009), 11; 1568-1582.
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?	
PRIZES AND AWARDS, STUDENT EVALUATION	
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 teacher	**PhD, Senka Gudić, Full Professor**
The course he/she teaches in the proposed study programme	Food Industry Waste Engineering
GENERAL INFORMATION ON COURSE TEACHER	
Address	Teslina 10/V, 21000 Split
Telephone number	++385 329 433
E-mail address	gudic@ktf-split.hr
Personal web page	
Year of birth	1965.
Scientist ID	181062
Research or art rank, and date of last rank appointment	Senior Research Scientist - May 12th, 2009.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Full Professor - July 25th, 2011.
Area and field of election into research or art rank	Technical Sciences, Chemical Engineering
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Chemistry and Technology, University of Split
Date of employment	November 2nd, 1990.
Name of position (professor, researcher, associate teacher, etc.)	Full Professor
Field of research	Analysis, synthesis and management of chemical processes
Function	
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty of Chemistry and Technology, University of Split
Place	Split
Date	June 21st, 2000.
INFORMATION ON ADDITIONAL TRAINING	
Year	
Place	
Institution	
Field of training	
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 (4)
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)	Solid Waste and Recycling - professional study of Chemical Technology (orientation: Chemical Technology and Materials)
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)	L. Vrsalović, **S. Gudić**, M. Kliškić, *Salvia Officinalis* L. honey as corrosion inhibitor for CuNiFe alloy in sodium chloride solution, Indian J. Chem. Technol. 19 (2012), 96-102. L. Vrsalović, E.E. Oguzie, M. Kliškić, **S. Gudić**, Corrosion inhibition of CuNi10Fe alloy with phenolic acids, Chem. Eng. Comm. 198 (2011) 1380-1393. L. Vrsalović, M. Kliškić, **S. Gudić**, I. Smoljko, Corrosion inhibition of Al-Mg alloy by gentisic acid, Indian J. Chem. Technol. 17 (2010) 89-94. L. Vrsalović, M. Kliškić, **S. Gudić**, Aplication of phenolic acids in the corrosion protection of Al-0.8Mg alloy in chloride solution, Int. J. Electrochem. Sci. 4 (2009) 1568-1582.
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?	
PRIZES AND AWARDS, STUDENT EVALUATION	
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 teacher	**PhD, Pero Dabić, Associate Professor**
The course he/she teaches in the proposed study programme	Safety at Work
GENERAL INFORMATION ON COURSE TEACHER	
Address	Teslina 10/V
Telephone number	021 329-470
E-mail address	dabic@ktf-split.hr
Personal web page	http://tkojetko.irb.hr/znanstvenikDetalji.php?sifznan=5319
Year of birth	1962.
Scientist ID	181084
Research or art rank, and date of last rank appointment	Scientific Advisor, 26. rujna 2013.
Research-and-teaching, art-and-	Associate Professor, 24. studenoga 2009.

teaching or teaching rank, and date of last rank appointment	
Area and field of election into research or art rank	Chemical engineering
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Chemistry and Technology in Split
Date of employment	19.03.1990.
Name of position (professor, researcher, associate teacher, etc.)	Associate Professor
Field of research	Inorganic Technology
Function	Professor
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Ph.D.
Institution	Faculty of Chemistry and Technology
Place	Split
Date	04. 04. 2004.
INFORMATION ON ADDITIONAL TRAINING	
Year	1991.
Place	Rapperswil, Swiss
Institution	Perkin-Elmer Laboratory
Field of training	Thermal analysis
MOTHER TONGUE AND FOREIGN LANGUAGES	
Mother tongue	Croatian
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	German (4)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	English (3)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
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)	-Toxicology and protection of the restoration, the Art Academy in Split, Department of Restoration and Conservation, University study (2000.-2004.) - Safety at work-Chemical Technology in Split, Chemical Technology and Materials and Food Technology, Professional Studies (2005. -) - Safety at work - Chemical Technology in Split, Chemistry and Chemical Technology, University undergraduate (2005. -) -Laboratory Safety - Pharmaceutical-Split, Integrated undergraduate and graduate of Pharmacy (2011. -)
Authorship of university/faculty textbooks in the field of the course	P. Dabić, Sigurnost pri radu, KTF, 2010.
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. Barbir, Damir; Dabić, Pero; Krolo, Petar. Hydration Study of Ordinary Portland Cement in the Presence of Lead(II) Oxide. // *CHEMICAL AND BIOCHEMICAL ENGINEERING QUARTERLY*. 27 (2013) , 1; 95-99 (članak, znanstveni). 2. Barbir, Damir; Dabić, Pero; Krolo, Petar. Stabilization of chromium salt in ordinary portland cement. //

	Sadhana. 37 (2012) , 6; 731-737 (članak, znanstveni). 3. Bralić, Marija; Buljac, Maša; Periš, Nenad; Buzuk, Marijo; Dabić, Pero; Brinić, Slobodan. Monthly and seasonal variations of NO2, SO2 and black-smoke located within the sport district in urban area, City of Split, Croatia. // *Croatica chemica acta*. 85 (2012) , 2; 139-145 (članak, znanstveni). 4. Barbir, Damir; Dabić, Pero; Krolo, Petar. Hydration study of ordinary Portland cement in the presence of lead(II) oxide // *Conference Proceedings: 3rd International Symposium on Environmental Management: Toward Sustainable Technologies* / Koprivanac, Natalija ; Kušić, Hrvoje ; Lončarić Božić, Ana (ur.).Zagreb : Faculty of Chemical Enginnering and Technology, University of Zagreb, 2011. 348-352 (poster,međunarodna recenzija,objavljeni rad,znanstveni 5. Dabić, Pero; Krolo, Petar; Bubić, Ana; Krstulović, Ruža. Solidification and stabilization of waste zeolite in cement matrix // *16.Internationale Baustofftagung, Tagungsbericht, Band I, II* / Fischer H.-B. (ur.). Weimar : F.A. Finger-Institute fur Baustoffkunde, Bauhaus-Universitat Weimar, 2006. 483-490 (međunarodna recenzija,objavljeni rad,znanstveni
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)	1. Cement composites and stabilization of hazardous waste (MZOS, 2007. -2014.). 2. Portland cement hydration and hazardous wastes (MZOS, 2002. - 2006.)
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?	Years of professor experience in graduate courses and undergraduate professional studies.
PRIZES AND AWARDS, STUDENT EVALUATION	
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)	Sigurnost pri radu, preddiplomski PK i PKT, 2010/11, 5,0 Sigurnost pri radu , stručni KTM i PT, 2010/11, 4,9 Sigurnost u laboratoriju , Farmacija, 2011/12, 4,9

First and last name and title of teacher	**PhD, Mira Krneta, Assistant Professor**
The course he/she teaches in the proposed study programme	Introduction to Entrepreneurship

GENERAL INFORMATION ON COURSE TEACHER	
Address	Split, Vukovarska 113
Telephone number	021 475 462; 098 239 987
E-mail address	mkrneta@hbor.hr
Personal web page	-
Year of birth	1958
Scientist ID	92366
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	Assistant Professor; 8/12/2009
Area and field of election into research or art rank	Economics; Management
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Croatian Bank for Reconstruction and Development
Date of employment	1/4/2004
Name of position (professor, researcher, associate teacher, etc.)	-
Field of research	-
Function	Head of Regional Office for Dalmatia
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty of Economics and Business
Place	University of Zagreb, Zagreb
Date	1/2/2005
INFORMATION ON ADDITIONAL TRAINING	
Year	2006
Place	Zagreb
Institution	Appraisers Association of Croatia
Field of training	Business valuation
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; good.
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	Italian; good.
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	Russian; good.
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)	Since academic year 2010/2011, as an external associate, have been teaching Hotel Industry Investment, in the graduate study. Since academic year 2010/1011, as an external associate, have been teaching practical part of Student Business Academy course. In academic year 2011/2012, as an external associate, taught Entrepreneurial Planning in the University Department of Professional Studies, University of Split. From academic year 2007/2008 to 2009/2010, as an external associate, taught Business Planning and Entrepreneurial Planning in the undergraduate study.

	From 2004 to 2006 included in the education process of start-up entrepreneurs at the Faculty of Economics, University of Split, and entrepreneurs centres in Zadar, Šibenik, Knin, and Split.
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)	Krneta, M.; Pivčević, S. The effects of chosen governmental financial policy measures aimed at Croatian islands' economic sustainability enhancement with special stress on tourism; Island Sustainability II; ed. S.Favro, C.A.Brebbia; WITpress, 2013.; str 12, str. 51-62. Alfirević, N.; Gonan Božac, M.; Krneta, M. Determinants of innovative start-up development in Croatia, The Future of Economics:Between Rules and Discretion, Gonan Božac, M.; Ribnikar, I. (ur.) Pula: Sveučilište u Puli, 2013; str. 229-250. Krneta, M. Poduzetnički identitet jadranske regije, Identitet jadranskog prostora Hrvatske: retrospekt i prospekt, Crnjak-Karanović, B.; Derado, D.; Fredotović, M.: Petrić, L. (ur.). Split: Sveučilište u Splitu, Ekonomski fakultet, 2012.; str.103-119. Krneta, M.; Šalinović, T. Poduzetnička aktivnost žena u Hrvatskoj: učestalost i glavna obilježja poduzetnica i poslovanja; u: Mala i srednja poduzeća: Financijska politika i ekonomsko-financijski okvir podrške; Ekonomski fakultet Split, 2012.; str. 95-111. Hell, M.; Krneta, M.; Krneta, P.; Application of AHP Method for the Selection of Business Plan Software; 14th International Conference on Operational Research KOI 2012.
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)	Ministry of Science, Education and Sports – research project: Identity of Croatian Adriatic Area and European Integration Processes. Ministry of Science, Education and Sports – research project: Small and Medium Enterprises: Financial Policy and Support.
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?	-
PRIZES AND AWARDS, STUDENT EVALUATION	
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)	Evaluation organizer: University of Split Business Planning; Entrepreneurial Planning, Hotel Industry Investment: very good. Student Business Academy: excellent.

3.4. Optimal number of students

In this programme admission quota is 30 students. According to the needs and interests of the corresponding the Faculty Council can change the admission quota

3.5. Estimate of costs per student

The Faculty of Chemistry and Technology currently offers professional study programme in Chemical Technology, field of study: Food Technology, fully financed by the Ministry of Science, Education and Sports. Furthermore, the Faculty of Chemistry and Technology currently offers undergraduate study programme in Chemical Technology, field of study: Chemical Engineering, with admission quota of 90 students. With introduction of the undergraduate study programme Food Technology, the admission quota would be proportionally reduced; therefore the introduction of the new programme Food Technology would not require any additional funds.

3.6. 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 (draft version)	
• Handbook on the quality assurance system of the constituent part (draft version)	
Description of procedures for evaluation of the quality of study programme implementation: • Fore 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.	
Evaluation of the work of teachers and part-time teachers	
Monitoring of grading and harmonization of grading with anticipated learning outcomes	

Evaluation of availability of resources (spatial, human, IT) in the process of learning and instruction	
Availability and evaluation of student support (mentorship, tutorship, advising)	
Monitoring of student pass/fail rate by course and study programme as a whole	
Student satisfaction with the programme as a whole	
Procedures for obtaining feedback from external parties (alums, employers, labour market and other relevant organizations)	
Evaluation of student practical education (where this applies)	
Other evaluation procedures carried out by the proposer	
Description of procedures for informing external parties on the study programme (students, employers, alums)	