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

FACULTY OF CHEMISTRY AND TECHNOLOGY
FACULTY OF MEDICINE

DETAILED PROPOSAL OF THE STUDY PROGRAM

INTEGRATED UNDERGRADUATE AND GRADUATE UNIVERSITY STUDY PROGRAM

PHARMACY

SPLIT, December, 2014

GENERAL INFORMATION OF HIGHER EDUCATION INSTITUTION

Name of higher education institution	Faculty of Chemistry and Technology Faculty of Medicine
Address	Split, Teslina 10/V Split, Šoltanska 2
Phone	++385 21 329 420 ++385 21 557 800
Fax	++385 21 329 461 ++385 21 557895
E.mail	dekanat@ktf-split.hr ivana.pletkovic@mefst.hr
Internet address	www.ktf-split.hr www.mefst.hr

GENERAL INFORMATION OF THE STUDY PROGRAMME

Name of the study program	Integrated undergraduate and graduate study of Pharmacy	
Provider of the study program	Faculty of Chemistry and Technology Faculty of Medicine	
Other participants	No other participants	
Type of study program	Vocational study program ☐	University study program ☒

Level of study program	Undergraduate ☐	Graduate ☐	Integrated ☒
	Postgraduate ☐	Postgraduate specialist ☐	Graduate specialist ☐
Academic/vocational title earned at completion of study	Master of Pharmacy		

1. INTRODUCTION

1.1. Reasons for starting the study programme

The Integrated undergraduate and graduate study of Pharmacy, organized jointly by the University of Split Faculty of Chemistry and Technology (FCT) and Faculty of Medicine (FM) enables the education of pharmacists as an important member of the healthcare system. The education of pharmacists is in-line with the European Directive 2005/36/EZ and it is adjusted to the requirements of the Croatian and European market and, at the same time, to the specificity and Mediterranean orientation nurtured by both University of Split FCT and FM. Providing the proper education of pharmacists wil directly positively affect the health welfare and the quality of life for the general population in the region. The Study of Pharmacy requires a high level of integration between science and practice on the highest criteria of excellence, which enables an academic frame d for practicing evidence based pharmacy and pharmacy adapted for the new role of pharmacists in the society. As seen form resolution of the European Council ResAP(2001)2, about the role of pharmacists in the patients safety, it is evident that the pharmacists represent an added value to the healthcare system due to their scientific and professional knowledge and the ethical approach to their practice.

Important reasons for starting this study program are the following:

- Public pharmacy and the beneficial influence on the healthcare community (local, regional and national): public pharmacies are affecting the development of the local community, especially the public health. Pharmacists have an important role in the preservation of health, promotion of a healthy life style, prevention of the diseases and improvement of the quality of life.
- A specific relationship toward the existing pharmacies in the south Croatian medicals centers (Zadar, Sibenik, Duborvnik, Imotski, Metkovic..)
- Assistance in implementing the national health guidelines in the regional level
- Cost reduction, at different levels, in comparison to the existing, remote Study of Pharmacy in Zagreb
- Benefit for the University (holding and developing its own intellectual potential, academic growth, teachers' mobility inside and outside the University, etc.)
- Creation of a competitive academic environment that is necessary for both scientific and professional development.
- Permanent educational support for Croatian people from Bosnia and Herzegovina, in the field of Biomedicine and health.

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

Regional and local communities, counties and cities, tourist offices and several other institutions are frequent partners to the Study of Pharmacy in organizing numerous activities related to health promotion and public education on health topics (congresses, symposia, tribunes, projects, educational projects, public health actions etc.)

1.3. Compatibility with requirements of professional organizations

The suggested program is compatible with the Directive 2005/36EZ of the European Parliament and European Council (07/09/2005) and it is created in agreement with the Croatian Pharmaceutical Chamber.

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

Possible partners outside the higher education system that expressed interest in the study program of the Study of Pharmacy and have establish a formal collaboration (including acting as teaching facilities and providing personnel, equipment and workspace for teaching and traineeship) and are plan to employ newly graduated pharmacists are the following:

- Split-Dalmatia County Pharmacy
- University Hospital Split
- Different other institutions from the health sector
- Croatian Agency for Medicinal Products and Medical Devices (HALMED)
- Pharmaceutical industry

1.5. Financing

Study of Pharmacy is completely financed by the Croatian Government, in accordance to the Croatian laws and regulations of the University of Split

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

The suggested study program is comparable to the accredited study programs for the Study of Pharmacy from the University of Ljubljana (http://www.ffa.uni-lj.si/en/academic-programmes/pharmacy-uniform/) and University of Sarajevo (http://ffsa.unsa.ba/nastavni-plan-program/).

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

The Study of Pharmacy program is organized by one-semester courses, which is an important prerequisite for student mobility. The compatibility of the study program with the similar studies gives an opportunity to enable student to attend courses on similar faculties. Therefore, the Study if open to student mobility inside the University of Split and between similar Universities in Croatia (with similar studies) - but also to the student mobility inside the EU. The elective courses will be available to other students from the University of Split to enroll. The student mobility on the national level is a prerequisite for a proper student mobility on 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

Study of Pharmacy is compatible with the University of Split mission and the strategy of the Faculty of Chemistry and Technology (FCT) and Faculty of Medicine (FM).

The University mission is to contribute to the society through development of higher education and lifelong learning programs, high quality research and scientific activities, art and professional wok in accordance with work ethics.University fo Split as a public university considers knowledge to be public good which is constantly carried out and enhanced through innovation and its implementation in local community, especially economy. Knowledge enhancement is the basis of University strength and autonomy. The key effort is to motivate students to engage into scientific work, education and innovation in order to make them pioneers in their fields.

University of Split strategy is based on the following documents:

- European strategy for smart, sustainable and inclusive growth, EUROPA 2020
- Strategy document European Research Area, ERA
- Strategy document European Higher Education Area, EHEA
- Strategy of education, science and technology, the Republic of Croatia

1.9. Current experiences in equivalent or similar study programmes

The Faculty of Chemistry and Technology (FCM) was established in 1960. Its focal points are Chemistry (Natural sciences) and Chemical engineering (Technical sciences) and, recently, Nutritional technology (Biotechnical sciences). Presently the following study programs are implemented: undergraduate and graduate Study of Chemistry, undergraduate and graduate Study of Chemical technology and doctoral study of Chemical engineering. The Faculty personnel have been participating in Chemistry courses within the University of Split and other Universities. In collaboration with the University of Zagreb Faculty of Pharmacy and Biochemistry, from the academic year 2003/2004, the first two years of the 5-years Study of Pharmacy program have been implemented at the Faculty of Chemistry and Technology, in accordance with the signed agreement between Universities, Faculties and the Ministry of Science. This Study of Pharmacy in Split was strongly noticed by the students from this region. However, by an unilateral decision from the University of Zagreb Faculty of Pharmacy and Biochemistry, this agreement was canceled on the academic year 2005/2006. The experience of the personnel from Faculty of Chemistry and Technology obtained from the previous years will be precious in implementing the program of the Study of Pharmacy.

The recent history of the education of the medical doctors in Split starts on 1974 when the University of Zagreb, Faculty of Medicine initiates a 2-year study, for the students on the 4th and 5th year. The integral 5-year Study of Medicine starts on 1979. This study will transform into an independent University of Split Faculty of Medicine (FM) on 1997. Its focal point is Biomedicine and health. Presently the following study programs are implemented: integrated

undergraduate and graduate Study of Medicine, integrated undergraduate and graduate Study of Dental Medicine and doctoral studies of Evidence-based medicine, and Tumor Biology. The human resources of the Faculty of Medicine are in-line with the highest standards in education.

The evaluation by the Croatian Agency for Science and High Education, implemented on 2008, alongside with the quality control from both faculties (FCM and FM), have shown that both faculties are excellent scientific and educational institutions.

From the academic year 2010/2011, FCM and FM have started to jointly organize and implement the Study of Pharmacy in Split.

2. DESCRIPTION OF THE STUDY PROGRAM

2.1. General information

Scientific/artistic area of the study programme	Biomedicine and health
Duration of the study programme	5 years
The minimum number of ECTS required for completion of study	300
Enrolment requirements and admission procedure	Completed 4-year secondary school and secondary school leaving exam.

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

After the graduation the Master of Pharmacy should be able to implement the acquired:

1. **Knowledge:**

Expert knowledge in drug development: apply the basic knowledge from Chemistry, Biochemistry, Molecular Biology, Physics, Mathematics and Statistics, required to define, analyze and suggest procedures related to drug research & development, production, analysis and quality control of drugs.

Expert knowledge in pharmacotherapy: apply the professional knowledge and competencies for advising about pharmacotherapy and implementing pharmaceutical care of patients, respecting the laws and regulations, actual heath policies and guidelines and the principles of pharmaceutical ethics and deontology.

2. **Personal skills (cognitive, psychomotor, social):**

Problem solving and decision making: show the perceptive, analytical and critical skills in the development and implementation of a solution for practical problems in drug production and monitoring of a secure and suitable application of drugs.

Communication skills: support positive interaction with patients, colleagues, other health workers and the general public, by using both oral and written forms of communication.

Teamwork skills: give a significant contribution in different situations and settings, like inter-professional assemblies, pharmaceutical milieu and professional organizations and boards, by performing responsibly and professionally.

3. **Professional skills:**

Pharmaceutical care for patients: provide appropriate care for patients, including informing and advising the patients about the efficacy and correct application of drugs, monitoring the progression and outcomes of the treatment, recognizing clinically relevant drug interactions and actively avoiding them, participating in the prevention of diseases, health promotion and public health initiatives, as a member of a health care team.

Production and control of pharmaceutical products: select and apply technological processes and analytical methods, including the innovative ones, support quality in the process of drug production, by applying the rules of the Good Laboratory Practice (GLP) and Good Manufacturing Practice (GMP), and the relevant European Directives and ISO norms.

Organization skills: efficiently apply the financial, advertising, and organizational principles important for individual and team work; contribute and supervise the drug distribution process, plan and provide pharmaceutical care.

Information skills: use information technologies and data bases for improving professional knowledge and skills and for self-education.

Research skills: critically evaluate and apply the latest scientific information and available data for professional development, problem solving, improvement of existing and adopting new technologies, writing professional and scientific publications, designing and leading professional and scientific projects and programs.

4. **Independency and responsibility :**

Independency: show independence in organizing, conducting and management, preparing strategy and business plans relevant for the profession.

Responsibility: apply the legal and ethical principles of the pharmaceutical vocation, in both individual and team work, perform activity related to the lifelong professional education and contribute to the advance of the pharmaceutical profession.

2.3. Completion of study

Final requirement for completion of	Final thesis ☐	Final exam ☐

study	Diploma thesis ☒	Diploma exam ☒
Requirements for final/diploma thesis or final/diploma/exam	Requirement for diploma thesis submission and diploma exam is passing of all exams.	
Procedure of evaluation of final/diploma exam and evaluation and defence of final/diploma thesis	The quality of graduation thesis and public thesis defense is graded. Graduation thesis quality is graded with 0-50 points, and public thesis defense is graded with 0-50 points. Grades: sufficient 56-65 points, good 66-75 points, very good 76-85 points and excellent 86 and more points.	

2.4. 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	KMF 101	Introduction to Pharmacy	15	0	0	0	2.0
	KMF 102	Mathematics and Statistics for Pharmacists	30	30	0	0	5.0
	KMF 103	Physics for Pharmacists	30	15	30	0	6.0
	KMF 104	General and Inorganic Chemistry	60	15	45	0	8.0
	KMF 105	Biology of Plants and Animals	30	15	30	0	6.0
	KMFI	Elective Course	30	0	0	0	3.0
	Total		195	75	105	0	30.0

List of courses							
Year of study: 1st							
Semester: 2nd							
STATUS	CODE	COURSE	HOURS IN SEMESTER				ECTS
			L	S	E	F	
Mandatory	KMF106	Analytical Chemistry I	30	15	45	0	6.0
	KMF107	Physical Chemistry	45	15	45	0	7.5
	KMF108	Pharmaceutical Botany	30	0	30	0	5.0
	KMF109	Human Anatomy and Histology	30	15	30	0	5.5
	KMF110	Pharmaceutical nomenclature	30	0	0	0	2.0
	KMFI	Elective Course	30	0	0	0	3.0
	KMFP1	Professional practice I**				15	1.0
	Total		195	45	150	15	30

List of courses							
Year of study: 1st							
Semester: 1st and 2nd							
STATUS	CODE	COURSE	HOURS IN SEMESTER				ECTS
			L	S	E	F	
Elective	KMFI1	Safety in Laboratory	30	0	0	0	3.0
	KMFI2	History of Pharmacy	30	0	0	0	3.0
	KMFI3	Pharmaceutical Museum	30	0	0	0	3.0
	KMFI4	Social Pharmacy	30	0	0	0	3.0
	KMFI5	Ecology of Health	30	0	0	0	3.0
	KMFI6	Pharmaceutical Marketing	30	0	0	0	3.0

List of courses							
Year of study: 2nd							
Semester: 1st							
STATUS	CODE	COURSE	HOURS IN SEMESTER				ECTS
			L	S	E	F	
Mandatory	KMF201	Analytical Chemistry II	30	15	30	0	6.0
	KMF202	Organic Chemistry I	30	15	30	0	8.0
	KMF203	Pharmaceutical Microbiology	30	0	30	0	5.0
	KMF204	Physiology	45	45	15	0	8.0
	KMFI	Elective Course	30	0	0	0	3.0
	Total		165	75	105	0	30.0

List of courses							
Year of study: 2nd							
Semester: 2nd							
STATUS	CODE	COURSE	HOURS IN SEMESTER				ECTS
			L	S	E	F	
Mandatory	KMF205	Organic Chemistry II	45	15	30	0	6.0
	KMF206	Pharmacognosy	60	15	30	0	7.0
	KMF207	Pathophysiology	30	15	30	0	5.0
	KMF208	Pathology	15	15	15	0	4.0
	KMF209	General Biochemistry	30	0	15	10	4.0
	KMFI	Elective course	30	0	0	0	3.0
	KMFP2	Professional practice II**	0	0		0	1.0
	Total		210	60	105	15	30

List of courses							
Year of study: 2nd							
Semester: 3rd and 4th							
STATUS	CODE	COURSE	HOURS IN SEMESTER				ECTS
			L	S	E	F	
Elective	KMFI7	Electroanalytics in pharmacy	30	0	0	0	3.0
	KMFI8	Basic Bioinorganic Chemistry	30	0	0	0	3.0
	KMFI9	Containers in Pharmacy	30	0	0	0	3.0
	KMFI10	Selected sections of Pharmaceutics	30	0	0	0	3.0
	KMFI11	Dietetics	30	0	0	0	3.0
	KMFI12	Pharmaceutical measurements	30	0	0	0	3.0

List of courses							
Year of study: 3rd							
Semester: 5th							
STATUS	CODE	COURSE	HOURS IN SEMESTER				ECTS
			L	S	E	F	
Mandatory	KMF301	Applied Biochemistry	30	15	30	0	6.5
	KMF302	Pharmaceutical Chemistry I	45	15	60	0	9.0
	KMF303	Instrumental Methods of Analysis	30	15	30	0	6.0
	KMF304	Quality of Natural Medicinal Products	15	0	0	0	2.0
	KMF305	Physical Biochemistry	30	15	0	0	3.5
	KMFI	Elective Course	15	0	15	0	3.0
	Total		165	60	135	0	30.0

List of courses							
Year of study: 3rd							
Semester: 6th							
STATUS	CODE	COURSE	HOURS IN SEMESTER				ECTS
			L	S	E	F	
Mandatory	KMF306	Pharmaceutical Chemistry II	30	15	0	0	4,5
	KMF307	Pharmacopoeia	30	15	30	0	5,0
	KMF308	Molecular Biology with Genetics	30	15	30	0	5,5
	KMF309	General Pharmacology	30	45	0	0	6,0
	KMF310	Operations of Pharmaceutical Technology	30	15	30	0	5,0
	KMFI	Elective Course	15	0	15	0	3,0
	KMFP3	Professional practice III**	0	0	0	15	1,0
	Total		165	120	105	15	30

List of courses							
Year of study: 3rd							
Semester: 5th and 6th							
STATUS	CODE	COURSE	HOURS IN SEMESTER				ECTS
			L	S	E	F	
Elective	KMFI13	Phytotherapy	15	0	15	0	3.0
	KMFI14	Drug Stability	15	0	15	0	3.0
	KMFI15	Cosmetology	15	0	15	0	3.0
	KMFI16	Aromatherapy	15	0	15	0	3.0
	KMFI17	Genetic Diversity of Autochthonic Plants	15	0	15	0	3.0

List of courses							
Year of study: 4th							
Semester: 7th							
STATUS	CODE	COURSE	HOURS IN SEMESTER				ECTS
			L	S	E	F	
Mandatory	KMF401	Special Pharmacology I	30	0	30	0	4.5
	KMF402	Drug Biochemistry	45	15	30	0	7.0
	KMF403	Extemporaneous Preparations	15	15	15	0	3.0
	KMF404	Technology of Synthetic Drugs	45	0	30	0	6.0
	KMF405	Pharmaceutical Legislation	30	0	0	0	2.5
	KMF406	Pharmaceutical Formulations	30	15	15	0	4.0
	KMFI	Elective Course	30	0	0	0	3.0
	Total		225	45	120	0	30.0

List of courses							
Year of study: 4th							
Semester: 8th							
STATUS	CODE	COURSE	HOURS IN SEMESTER				ECTS
			L	S	E	F	
Mandatory	KMF407	Special Pharmacology II	30	15	0	0	4.0
	KMF408	Biotechnological Process of the Pharmaceutical Industry	30	0	30	0	4.5
	KMF409	Pharmaceutical Toxicology	30	15	15	0	4.5
	KMF410	Immunology and Vaccines	30	15	15	0	4.5
	KMF411	Pharmaceutical Quality Control	30	15	0	0	4.5
	KMF412	Scientific Methodology in Pharmacy	15	15	15	0	4.0
	KMFI	Elective Course	30	0	0	0	3.0
	KMFP4	Professional practice IV**				15	1.0
	Total		195	75	75	15	30

List of courses							
Year of study: 4th							
Semester: 7th and 8th							
STATUS	CODE	COURSE	HOURS IN SEMESTER				ECTS
			L	S	E	F	
Elective	KMFI18	Mechanisms of Carcinogenesis	30	0	0	0	3.0
	KMFI19	Economy of the Pharmaceutical Industry	30	0	0	0	3.0
	KMFI20	Tribunal Pharmacy	30	0	0	0	3.0
	KMFI21	Oncological Pharmacy	30	0	0	0	3.0
	KMFI22	Immunochemical analytical methods	30	0	0	0	3.0
	KMFI23	Pharmaceutical Forensics	30	0	0	0	3.0
	KMFI24	Drug Research & Development	30	0	0	0	3.0

List of courses							
Year of study: 5th							
Semester: 9th							
STATUS	CODE	COURSE	HOURS IN SEMESTER				ECTS
			L	S	E	F	
Mandatory	KMF501	Pharmaceutical Care and Self-Medication	30	15	0	0	3.5
	KMF502	Clinical Pharmacology	45	0	15	0	5.5
	KMF503	Clinical Pharmacy	15	15	15	0	4.0
	KMF504	Clinical Laboratory Diagnostics	30	15	30	0	5.0
	KMF505	Pharmaceutical Ethics and Deontology	30	0	0	0	2.0
	KMF506	Pharmacotherapy	30	15	0	0	4.0
	KMFDR	Diploma Thesis**			60		6.0
	Total		180	60	120	0	30.0

** Requirement for diploma thesis submission and diploma exam is passing of all exams.

List of courses							
Year of study: 5th							
Semester: 10th							
STATUS	CODE	COURSE	HOURS IN SEMESTER				ECTS
			L	S	E	F	
Mandatory	KMFP5	Professional traineeship* * 6 months of professional traineeship in public pharmacy			940		30
	Total						

2.5. Course description

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">Introduction to Pharmacy</td></tr>
<tr><td>Code</td><td>KMF101</td><td>Year of study</td><td colspan="4">1st</td></tr>
<tr><td>Course teacher</td><td>Mate Portolan,MPharm, lecturer</td><td>Credits (ECTS)</td><td colspan="4">2.0</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>T</td></tr>
<tr><td>15</td><td>0</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">0%</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">Not applicable.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">1. Name and emphasize important facts, dates and persons from the history of pharmacy
2. Name and emphasize important facts about the scientific approach toward chemistry and pharmacy
3. Select the appropriate pharmaceutical ethical principle
4. Describe and define the area of interest of the pharmaceutical care
5. Describe and define the working responsibilities of a pharmacist
6. Remember important facts and definitions about drugs</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="6">Allegorical representation of Pharmacy and mythology of pharmacy. Medications in the New Testament and Christ as apothecary. The birth certificate of pharmacy and its Croatian sources. The creative force of pharmacy: unusual life stories, the tale of white gold, Goethe and pharmacy. The essence of pharmacy and the pharmaceutical map of Europe. The light of the reason: the discovery of the plant insecticide, the truth about the quality, pharmacopeia, materia medica, the enchanted Galenic game. Pharmacy in books and pharmaceutical information. Information from chemistry and drug terminology. The role of patients in the treatment with medications. Pharmacist—the best chemist. Roger and Francis Bacon envisage laboratory work. Chemistry—the central science. Pharmacist—a health educator. Pharmacotherapy for laypersons. Ask about your medications. Ethics and the community. Lexicons about drugs. External packaging of a commercially packaged drug. A window into pharmacology. The pharmacy as an institution: about its name, in the society and according to Shakespeare. The production of drugs and pharmaceutical forms. The contact with science: observation and conclusion, to err is human, the problem of rules that may err and probability. Observation as the source of knowledge, experiment and conclusion in science. Imagination is more important than information. Linus Pauling. Professional terminology and Croatian names.</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒ lectures
☐ seminars and workshops
☐ exercises</td><td colspan="3">☐ independent assignments
☐ multimedia
☐ laboratory
☐ work with mentor</td></tr>
</table>

	☐ *on line* in entirety ☐ partial e-learning ☐ field work	☐ (other)
Student responsibilities	In accordance to Rules of studying and Deontological code for USSM students.	

Screening student work *(name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)*						
	Class attendance	1	Research		Practical training	
	Experimental work		Report		(Other)	
	Essay		Seminar essay		(Other)	
	Tests		Oral exam		(Other)	
	Written exam	1	Project		(Other)	

Grading and evaluating student work in class and at the final exam	Standardized written test.

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	V. Grdinić, Uvod u farmaciju, Vlastita naklada, Drugo izdanje, Zagreb, 2004	30	

Optional literature (at the time of submission of study programme proposal)	M.Portolan, D.Jonjić, A.Grundler: *Ljekarnička praksa: ljekarnici u skrbi za bolesnik*a, HLJK, Zagreb, 2011. www.hljk.hr - izdavačka djelatnost
Quality assurance methods that ensure the acquisition of exit competences	▪ Teaching quality analysis by students and teachers ▪ Exam passing rate analysis ▪ Committee for control of teaching reports External evaluation
Other (as the proposer wishes to add)	

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">Mathematics and statistics for pharmacists</td></tr>
<tr><td>Code</td><td>KMF102</td><td>Year of study</td><td colspan="4">1st year</td></tr>
<tr><td>Course teacher</td><td>Mr. Branka Gotovac, lecturer</td><td>Credits (ECTS)</td><td colspan="4">5.0</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Doc. dr. sc. Ana Jerončić
Lucija Ružman, assistant
Mario Malički, MD</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>30</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="4">15-20</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">To introduce students to the basic elements of calculus and statistics in biomedicine and apply them to problem solving in pharmacy.</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">Basic computer literacy, which includes the work with Windows OS and MS Office package.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">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
-identify mathematical applications of problem solving in pharmacy
-recognize the importance of sampling and describing samples
-describe and discuss the distribution of different types of variables
-recognize the importance of precision in presenting statistical data
-be able to calculate 95% confidence intervals, sensitivity and specificity, NNT
-compare different samples using descriptive and analytic statistics
-discuss the statistical and clinical significance</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="6">Mathematics
<table>
<tr><td>Day</td><td>Lectures</td><td>Seminars</td></tr>
<tr><td>1.</td><td>3 h: Sets.
Notion. Algebra of sets. Sets of numbers.</td><td>-</td></tr>
<tr><td>2.</td><td>2 h: Functions.
Notion. Composite functions. Inverse function.</td><td>2 h: Sets of numbers.</td></tr>
<tr><td>3.</td><td>-</td><td>2 h: Domain of a function.</td></tr>
<tr><td>4.</td><td>4 h: Elementary functions.
Limits. Continuity.</td><td>-</td></tr>
<tr><td>5.</td><td>4 h: Derivative and application.
Notion. Interpretation.
Derivative techniques.
Theorems of differential calculus. Maximum, minimum points.</td><td>-</td></tr>
<tr><td>6.</td><td>-</td><td>3 h: Sequences.
Notion. Limits.</td></tr>
<tr><td>7.</td><td>2 h: Inflection points.
Asymptotes. Graphs</td><td>2 h: Derivative techniques.</td></tr>
</table></td></tr>
</table>

	sketching.	
8.	-	**4 h**: Tangent and normal lines. Maximum, minimum points. Inflection points. L´Hopital´s rule.
9.	-	**2 h**: Graphs sketching.

Statistics

Day	Lectures	Seminars
1.	**5 h**: Science. Introduction to statistics	**-**
2.	**-**	**3 h**: Testing for normality. Mean and standard deviation. Work in Excel.
3.	**-**	**3 h**: Median and interquartile range. Work in MedCalc.
4.	**4 h**: Sampling. Confidence intervals and standard error of mean.	**-**
5.		**3 h**: Confidence intervals and standard error of mean.
6.	**3 h**: Hypothesis testing.	**3 h**: T-test, Mann-Whitney u test. Chi-square test.
7.	**3 h**: Specificity and sensitivity. NNT.	**3 h**: Specificity and sensitivity. NNT.

Format of instruction	✕ lectures ✕ seminars and workshops ☐exercises ☐on linein entirety ☐partial e-learning ☐field work	✕independent assignments ✕multimedia ☐laboratory ✕work with mentor ☐ (other)
Studentresponsibilities	In accordance to Rules of studying and Deontological code for USSM and FCT students.	

Screening student work*(name the proportion of ECTS credits for eachactivity so that the total number of ECTS credits is equal to the ECTS value of the course)*						
Class attendance		Research		Practical training		
Experimental work		Report		(Other)		
Essay		Seminar essay		(Other)		
Tests	3,3	Oral exam		(Other)		
Written exam	0,9	Project	0,8	(Other)		

Grading and evaluating student work in class and at the final exam	The examination (mathematics) consists of the number of points on the Colloquium (10th day). The examination (statistics) consists of: a) the number of points on two Colloquium (4th and 7th day) b) The number of points on the exercises that students independently perform and submit at the end of each seminar c) Number of points on a final written exam test
Required literature	**Title** / **Number of** / **Availability via**

		copies in the library	other media
(available in the library and via other media)	Bradić T, Roki R et al. Matematika za tehnološke fakultete. Više izd. Zagreb: Element	47	
	Demidovič BP, Zadaci i riješeni primjeri iz više matematike. Više izd. Zagreb:Tehnička knjiga	5	
	Slapničar I. Matematika 1. Split: Fakultet elektrotehnike, strojarstva i brodogradnje u Splitu, Sveučilište u Splitu; 2002. Dostupno na: http://lavica.fesb.hr/mat1		
	Marušić M, urednik. Uvod u znanstveni rad u medicini. 5. izd. Zagreb: Medicinska naklada; 2013.	20	
	Ferenczi E, Muirhead N. Statistika i epidemiologija u jednom potezu. Zagreb: Medicinska naklada; 2011.	20	
	Svi materijali s predavanja, seminara i vježbi	-	Availabe on the course website
Optional literature (at the time of submission of study programme proposal)	Kurepa S. Matematička analiza I i II dio. Zagreb: Školska knjiga; 1997. Krnić L, Šikić Z. Račun diferencijalni i integralni I dio. Zagreb: Školska knjiga; 1992. Hughes-Hallett, Gleason et al. Calculus. New York: John Wiley and Sons, Inc; 2000. Diez DM, Barr CD, Çetinkaya-Rundel M. OpenIntro Statistics: Second Edition. Freely available at: https://www.openintro.org/stat/textbook.php		
Quality assurance methods that ensure the acquisition of exit competences	Quality assurance is carried out at three levels: (1) University level (2) Faculty level, based on the action of the Commission for Quality Control, and (3) Teachers level.		
Other (as the proposer wishes to add)			

<table>
<tr><td>COURSE NAME</td><td colspan="5">PHYSICS FOR PHARMACYSTS</td></tr>
<tr><td>Course code</td><td>KMF103</td><td>Year of study</td><td colspan="4">1st</td></tr>
<tr><td>Course lecturer</td><td>PhD, Magdi Lučić Lavčević
Associate Professor</td><td>Credits (ECTS)</td><td colspan="4">6.0</td></tr>
<tr><td rowspan="2">Assistants</td><td rowspan="2">PhD, Mirko Marušić,
Senior Lecturer
Lucija Matković, assistant</td><td rowspan="2">Type of instruction</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>0</td></tr>
<tr><td>Course status</td><td>Mandatory</td><td>Application of e-learning (percentage)</td><td colspan="4"></td></tr>
<tr><td colspan="6">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="5">Forming the proper view on the interpretation of physics phenomena and their application. Introducing the students to theoretical knowledge and developing the skills of distinguishing the properties and terms of the classic and modern physics. Mastering the scientific physics approach of the experimental observation and methods required for laboratory work and use of modern measuring equipment.</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 the course, the student is expected to have mastered
- the physical quantities, units and dimensional analysis;
- the recognition of the properties of the exact approach to phenomena in the macroworld and microworld
- the principles of general mechanics and special mechanics (mechanics of oscillations, waves and fluids)
- the principles of heat and termodynamics
- the principles of electromagnetism and properties of electromagnetic radiation
- the principles of geometrical and physical optics
- the concepts of modern physics
- the application of the obtained knowledge in solving problem tasks
- the methods of measurement of selected physics quantities
- conducting experiments individually
- the skills of graphic presentation of the measured data and the method of writing reports pertaining to the experiment and the results of conducted measurements</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="5">1st week: Measurement. Motion and forces. Work and energy. System of particles. Collisions. Rotations. Conservation laws in mechanics. Elasticity. Oscillations. Mechanical waves. Sound. Ear physics. Fluid mechanics. (10 hours)
Seminar: Solving the numerical examples pertaining to the theoretical content addressed during the course (10 hours)
Laboratory exercises (10 hours)
Partial assessment (1st preliminary test) related to seminars and theory addressed during the course.

2nd week: Molecular-kinetics theory and thermodynamics. Transport phenomena. Electrostatics and magnetostatics. Electric current. Electromagnetism. Alternate current. Electromagnetic waves . Light (10 hours)
Seminar: Solving the numerical examples pertaining to the theoretical content addressed during the course (10 hours)
Laboratory exercises (10 hours)
Partial assessment (2nd preliminary test) related to seminars and theory addressed</td></tr>
</table>

	during the course. 3rd week: Physical optics. Geometrical optics. Optic instruments. Eye physics. Ideas of quantum physics. Atoms, lasers and laser beams. Atomic nucleus. Radioactivity. (10 hours) Seminar: Solving the numerical examples pertaining to the theoretical content addressed during the course (10 hours) Laboratory exercises (10 hours) Partial assessment (3rd preliminary test) related to seminars and theory addressed during the course.
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** group and individual tutorials **X** seminars
Student responsibilities	

Screening student work *(name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)*						
	Class attendance	0.9	Research		Practical training	
	Experimental work	1.1	Report		Pre-test preparation classes	0.6
	Essay		Seminar essay		(Other)	
	Tests	1.2	Oral exam	1.1	(Other)	
	Written exam	1.1	Project		(Other)	

Grading and evaluating student work in class and at the final exam	During the turnus, the final exam can be substituted via 3 midterm exams, related to lectures (theory) and seminars (solving problems), according to syllabus. During the final examination period, the final theory exam shall be taken after passing the final problem´s solving exam. Grades: 55-64% - sufficient; 65-79% - good, 80-89% - very good; 90-100% - excellent

Required literature (available in the library and via other media)	**Book title**	**Number of books in the library**	**Available via other media**
	N. Cindro, Fizika I, Školska knjiga Zagreb, Zagreb, 1985.	10	-
	N. Cindro, Fizika II, Školska knjiga Zagreb, Zagreb, 1988.	10	-
	E. Babić, R. Krsnik, M. Očko, Zbirka riješenih zadataka iz fizike, Školska knjiga Zagreb, Zagreb, 1990.	3	-

Optional literature	D. Halliday, R. Resnick, J. Walker, Fundamentals of Physics, John Wiley & Sons, New York, 1993. J. Herak, Osnove kemijske fizike, Farmaceutsko-biokemijski fakultet Sveučilišta u Zagrebu, 2001.
Quality assurance methods that ensure the	Quality assurance will be performed at three levels: (1) University Level; (2) Faculty Level by Quality Control Committee; (3) Lecturer's Level.

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

NAME OF THE COURSE	General and Inorganic Chemistry					
Code	KMF104	Year of study	1.			
Course teacher	dr. sc. Slobodan Brinić, associate professor dr. sc. Zoran Grubač, full professor	Credits (ECTS)	8.0			
Associate teachers		Type of instruction (number of hours)	L	S	E	F
			60	15	45	
Status of the course	Mandatory	Percentage of application of e-learning				

COURSE DESCRIPTION	
Course objectives	To familiarize students with the basic chemical laws and principles and to introduce students to the chemical reactivity of elements along the periodic table, and with the properties and composition of common chemicals. To enable students to master the chemical items that follow General and inorganic chemistry. To develop students ability to think critically about the experiments performed in the laboratory and about the involvement of chemistry in everyday life.
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 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) Understand and applied 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) Know the basic characteristics and producing of chemical elements for the major groups of periodic table of elements (PTE) 7) Classify compounds on the base of their characteristics 8) Predict the possible reaction mechanisms and outcomes of chemical reactions 9) Independently and safely perform simple chemical experiments
Course content broken down in detail by weekly class schedule (syllabus)	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. 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. Complex compounds. 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 16. Hydrogen position in PTE, hydrogen properties and production, positive oxidation state and hydrides. Noble gases, properties of group, obtaining and using of xenon compounds 17. Introduction to halogens, elements properties in order to oxidation state. Fluorine properties, differences between the fluorine and the other members of the group, fluorine compounds. Chlorine producing and properties, compounds of chlorine, bromine and Iodine 18. Introduction to chalcogen elements, elements properties in order to oxidation state. Oxygen properties and production, the compounds of oxygen, oxides, water. Sulfur properties and production, oxides and sulfur acids, other sulfur compounds, compounds of selenium and tellurium, 19. A group of nitrogen, elements properties in order to oxidation state Nitrogen, properties of the production, ammonia, nitric acid and other nitrogen compounds, nitrogen fixation. Phosphorus, properties and production, oxides and acids of phosphorus, arsenic, antimony and bismuth 20. Carbon allotropes, carbon properties and production,carbon.oxides. carbides, carbonates and bicarbonates. A group of boron, elements properties in order to oxidation state, boranes, boric acid. Alkali and alkaline earth metals

<table>
<tr><td></td><td colspan="6">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.
14. Balancing chemical reactions, writing and balancing redox reactions in one line
15. Characteristics reactions in Inorganic chemistry

Lab Course:

1. Pure substances; Physical and changes.
2. Gas laws
3. Solution
4. 4Chemical equilibria
5. Hydrogen; Groups: 5., 17., 16. and 15. PSE
6. Nickel complexes
7. Groups: 14. , 13. , 2. , 1. PSE i transition metals</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="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</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>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></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Grading and evaluating student work in class and at</td><td colspan="6">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</td></tr>
</table>

<table>
<tr><td>the final exam</td><td colspan="3">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.</td></tr>
<tr><td rowspan="11">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 I II dio, Školska knjiga, Zagreb, 1995</td><td>10</td><td></td></tr>
<tr><td>S. Brinić: „Recenzirana predavanja iz odabranih poglavlja Opće kemije i Anorganske 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 i Anorganske kemije“ Veljača 2012. KTF-Split. 30.1.2014. <http://www.ktf-split.hr/~grubac/</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>web http://www.ktf-split.hr</td></tr>
<tr><td>Vježbe iz Anorganske kemije (interna skripta), Kemijsko-tehnološki fakultet, Split, 2013.</td><td></td><td>web http://www.ktf-split.hr</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="3">Darrell D. Ebbing and Steven D. Gammon, General Chemistry, 9th edition, Houghton Mifflin Company, Boston, 2009.
Raymond Chang, Chemistry, 10th edition, McGraw-Hill, New York, 2010.
F. Albert Cotton et al., Basic Inorganic Chemistry, New York, John Wiley and Sons, 1995.</td></tr>
<tr><td>Quality assurance methods that</td><td colspan="3">- Information from interviews, observations, and consultation with students during lectures</td></tr>
</table>

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

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">Biology of Plants and Animals</td></tr>
<tr><td>Code</td><td>KMF105</td><td>Year of study</td><td colspan="4">1st</td></tr>
<tr><td>Course teacher</td><td>Doc.dr.sc. Vesna Boraska Perica</td><td>Credits (ECTS)</td><td colspan="4">6.0</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Prof.dr.sc. Tatijana Zemunik
Doc. dr. Maja Barbalić.
Ivana Gunjaca, dipl. ing.
Nikolina Vidan, mag.</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>T</td></tr>
<tr><td>30</td><td>15</td><td>30</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">0%</td></tr>
<tr><td colspan="6">COURSE DESCRIPTION</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="5">Not applicable.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="5">Identify, describe and explain the basic concepts of the modern biological science, necessary for diagnostics and treatment of illness as well as the future of medicine in general. Name and discriminate specialist vocabulary needed to read up-to-date biomedical literature. Identify, explain, analyze, and finally link and integrate the cell biology, molecular biology, developmental biology and genetics with emphasis placed on human being. Students will be actively involved in lectures, seminars and exercises with the problem-based teaching model adopted. Such model enables students to develop simple, practical communication, explain basic biological processes and create critical thinking based on the knowledge of modern biological science that has been acquired during the course.</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="5">The evolution of cell and cell organisation. Symbiotic theory – origin of chloroplast, mitochondria in eukaryotes. Structure of cell membranes and mechanism of cell transports. The cell nucleus, DNA structure and organisation. RNA molecules in cell and there regulations. Structure and function of nucleolus. Kinds, organisation and structure of ribosomes. CD – protein synthesis. The endoplasmic reticulum and Golgi apparatus. The plastids – chloroplasts submicroscopic structure and photosynthesis. The mitochondria submicroscopic structure and metabolism. The peroxisomes and there metabolic role. The cytoskeleton and cell movement. The cell cycle. The chromosome structure and movement through cell division. The kinds and principle of mitosis. The process of meiosis, oogenesis and spermatogenesis. The cell proliferation in development and differentiation. Inheritance, offspring. Gene segregation, linkage and genetically diseases. Mutation, Downov’s syndrome. Jacob-Monod model of gene regulation. Regulation of programmed cell death. Types and causes of tumor.</td></tr>
<tr><td>Format of instruction</td><td colspan="2">☒ lectures
☒ seminars and workshops
☒ exercises
☐ on line in entirety
☐ partial e-learning</td><td colspan="3">☐ independent assignments
☐ multimedia
☐ laboratory
☐ work with mentor
☐ (other)</td></tr>
</table>

	☐ field work					
Student responsibilities	In accordance to Rules of studying and Deontological code for USSM students.					
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	3	Research		Practical training	
	Experimental work		Report		(Other)	
	Essay		Seminar essay	1	(Other)	
	Tests		Oral exam		(Other)	
	Written exam	2	Project		(Other)	
Grading and evaluating student work in class and at the final exam	Written exam.					

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Cooper GM, Hausman RE. Stanica - Molekularni pristup, Medicinska naklada, Zagreb, 2010., 5. hrvatsko izdanje.	15	
	Peruzović M., Zemunik T.: Medicinska biologija, Priručnik za mikroskopske vježbe, Katedra za medicinsku biologiju, Medicinski fakultet u Splitu, Split, 2010.	0	Yes
	Hand-outs by prof. Zemunik	0	Yes
	Maja Vlahović „ Zakonitosti nasljeđivanja“	0	Yes

Optional literature (at the time of submission of study programme proposal)	1. Alberts B et. all. Essential Cell Biology, New York, Garland Science, 3/e, 2009. 2. Turnpenny P, Ellard S. Emeryjeve osnove medicinske genetike.14. izdanje, Medicinska naklada, Zagreb, 2011. 3. Gilbert SF. Developmental Biology, Sinauer, 8/e, 2006.
Quality assurance methods that ensure the acquisition of exit competences	▪ Teaching quality analysis by students and teachers ▪ Exam passing rate analysis ▪ Committee for control of teaching reports ▪ External evaluation
Other (as the proposer wishes to add)	

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="6">Analytical Chemistry I</td></tr>
<tr><td>Code</td><td>MF106</td><td>Year of study</td><td colspan="5">1.</td></tr>
<tr><td>Course teacher</td><td>Doc. dr. sc. Lea Kukoč Modun</td><td>Credits (ECTS)</td><td colspan="5">6.0</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Maja Biočić, mag. ing. chem. ing.
Andea Anđić, mag. chem.
Ivana Plazibat, mag. chem.</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>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="5">0 %</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">The aim of the course is to introduce students to the processing of measurement, measuring units, expressing concentration, stoichiometry and chemical equilibrium with accent on analytical application. Furthermore, the goal is to familiarize students with the mechanisms and equilibrium of homogeneous chemical reactions and their application in analytical methods of determination.</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">1. Process experimental data and express the uncertainty.
2. Define chemical equilibrium and state the types of homogeneous and heterogeneous chemical equilibrium.
3. Calculate the pH value.
4. Calculate and predict the acid-base titration curve. Apply acid-base titration based on theoretical predictions.
5. Explain the method of calculating pM values different parts of the EDTA titration curves, based on the application of knowledge of the equilibrium of complex formation.
6. Describe and sketch the types of electrochemical cells.
7. Calculating the equilibrium constant of redox reactions.
8. Construct the redox titration curve and anticipate the possibility of using visual redox indicators based on theoretical predictions.
9. Solve numerically analytical problems.
10. Plan and implement chemical experiment on the basis of theoretical knowledge and predictions based on calculations.</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="6">Lectures:
L 1: The importance of analytical chemistry, the development of analytical chemistry, the role of the analyst in the selection of analytical techniques and solving the problem.
L 2: Analytical signal.
L 3: Examples of the analysis of real samples, experimental data processing.
L 4: Classification of analytical chemistry (chemical analysis, heterogeneous and homogeneous systems, equilibrium and stable state, equilibrium constants, activity, homogeneous and heterogeneous equilibrium is of greater importance in analytical chemistry).</td></tr>
</table>

	L 5: Acid-base equilibrium, strengths of acids and bases, strong acid and bases. L 6: Weak acid and bases, fraction of dissociation. L 7: Buffers, buffer capacity, ionization of drugs. L 8: Polyprotic acid-base equilibrium, pH value of H_2SO_4 solution, acidity and alkalinity. L 9: Quantitative determination, titrations, standard preparation. L 10: Acid-base titrations, titration of the strong acid with strong base and strong base with strong acid. L 11: Titration of the weak acid with strong base and weak base with strong acid. L 12: Titrations in polyprotic systems. L 13: Finding the end point with visual indicators and pH electrode. Titration methods recommended by the Pharmacopoeia. L 14: Titration in nonaqueous solvents. L 15: Complex formation. L 16: EDTA, conditional formation constant. L 17: EDTA titrations. L 18: The impact of conditional formation constants on the inflection of the EDTA titration curves. L 19: Auxilary complexing agents. L 20: Metal ion indicators. Titration methods recommended by the Pharmacopoeia. L 21: Redox reaction, Galvanic cells. L 22: Standard potential, Nernst equation. L 23: Equilibrium constant, conditional equilibrium constant. L 24: Calculating the redox equilibrium constant. L 25: Redox titrations. L 26: Redox titration based on the simple stochiometry redox reaction. L 27: Redox titration based on the complex stochiometry redox reaction. L 28: Redox titration based on the complex stochiometry redox reaction, the effect of pH value, analysis of a mixture. L 29: Titration methods recommended by the Pharmacopoeia. Adjustment of analyte oxidation state. L 30: Preparation and standardization of titration standards. Seminars: S 1: Experimental data processing (numerical examples). S 2: Stochiometry, activity, activity coefficient (numerical examples). S 3: Strong acid and bases, weak acid and bases, fraction of dissociation (numerical examples). S 4: Buffers, ionization of drugs, polyprotic acids (numerical examples). S 5: Titration of the strong acid with strong base and strong base with strong acid (numerical examples, titration curve construction, using of the Excel spreadsheet). S 6: Titration of the weak acid with strong base and weak base with strong acid (numerical examples, titration curve construction, using of the Excel spreadsheet). S 7. Titrations in polyprotic systems, finding the end point with visual indicators and pH electrode (numerical examples, titration curve construction, using of the Excel spreadsheet). S 8: Complex formation, conditional formation constant (numerical examples).. S 9: EDTA titrations (numerical examples, titration curve construction, using of the Excel spreadsheet). S 10: Auxilary complexing agents (numerical examples, titration curve construction,

<table>
<tr><td></td><td colspan="6">using of the Excel spreadsheet).
S 11: Redox reaction (numerical examples).
S 12: Calculating the redox equilibrium constant (numerical examples).
S 13: Redox titration based on the simple stochiometry redox reaction (numerical examples, titration curve construction, using of the Excel spreadsheet).
S 14: Redox titration based on the complex stochiometry redox reaction, the effect of pH value (numerical examples, titration curve construction, using of the Excel spreadsheet).
S 15: Analysis of a mixture (numerical examples, titration curve construction, using of the Excel spreadsheet).

Experimental work:
1. (5 hours): Basic laboratory operations.
2. (5 hours) Preparing standard solution.
3. (5 hours) Acid-base titration, determination of $H_2C_2O_4$.
4. (5 hours) Finding the end point with pH electrode. Determination of ascorbic acid in pharmaceutical formulations.
5. (5 hours) EDTA titration, determination of Fe^{3+}.
6. (5 hours) Redox titration, determination of Cu^{2+}.
7. (5 hours) Extraction.
8. (5 hours) Ion exchange.
9. (5 hours) Cromatography.</td></tr>
<tr><td>Format of instruction</td><td colspan="3">x lectures
x 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
x team based learning</td></tr>
<tr><td>Studentresponsibilities</td><td colspan="6">The 70% presence at lectures and 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></td><td>Research</td><td></td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td>5 % (0,3 ECTS)</td><td>Report</td><td></td><td>Test of numerical examples</td><td>30 % (1,8 ECTS)</td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>Test of teoretical part</td><td>50 % (3,0 ECTS)</td></tr>
<tr><td>Tests</td><td></td><td>Oral exam</td><td>15 % (0,9 ECTS)</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></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">Scoring at the exam consists of three basic parts: scoring the experimental part (minimum score 2, maximum score 4), test of numerical example (minimum score: 18; maximum score: 30) and test of theoretical part (minimum score: 39; maximum score: 65).
Students who had attended lectures and seminar in 70 % can take the exam through partial tests: 2 tests of numerical examples (minimum score: 9; maximum score: 15).
The rating is formed in accordance with the score ranges: sufficient (60 - 70 points), good (71-80 points) , very good (81-90 points) , excellent (≥91points)</td></tr>
<tr><td>Required literature</td><td colspan="3">Title</td><td>Number of</td><td>Availability via</td></tr>
</table>

		copies in the library	other media
(available in the library and via other media)	Nj. Radić i L. Kukoč Modun, Uvod u analitičku kemiju I. dio, Redak, Split, 2013.	32	
	D.A. Skoog, D.M. West, F.J. Holler, Osnove analitičke kemije, šesto izdanje (englesko), prvo izdanje (hrvatsko), Školska knjiga, Zagreb, 1999.	18	
	M. Kaštelan-Macan, Kemijska analiza u sustavu kvalitete, Školska knjiga, Zagreb 2003.		
	European Pharmacopoeia 7th edition, European Directorate for the Quality of Medicines & HealtCare, Council of Europe, Stasbourg 2010.	1	
	A. Prkić, Vježbe iz analitičke kemije, Preddiplomski studij kemijske tehnologije, interna recenzirana skripta, Split, 2008. (odabrana poglavlja)		available in digital form
	Vježbe iz kvalitativne analitičke kemije, dr. sc. Josipa Komljenović, doc. (odabrana poglavlja)		available
Optional literature (at the time of submission of study programme proposal)	1. R. Kellner, J. M. Mermet, M. Otto, M. Valcarcel and H. M. Widmer (Urednici), Analytical Chemistry (A Modern Approach to Analytical Science, Second Edition) Wiley-VCHVerlag Gmbh & Co. KGaA, Weinheim, 2004. 2. D. A. Skoog, D. M. West, F. J. Holler and S. R. Crouch, Fundamentals of Analytical Chemistry, Eighth Edition, Thompson Brooks/Cole, Belmont, USA, 2004. 3. G. D.Christian, Analytical Chemistry, Sixth Edition, John Willey & Sons, INC, 2004. 4. D. Harvey, Modern Analytical Chemistry, McGraw-Hill Higher Education, New York, London, 2000. 5. F. W. Fifield & D. Kealey, Principles and Practice of Analytical Chemistry, Blackwell Science Ltd, Malden MA, London, 2000. 6. M. Kaštelan-Macan, Enciklopedijski rječnik analitičkog nazivlja, FKIT, Mentor, Zagreb 2014. 7. D. G. Watson, Pharmaceutical analysis, Elsevier, London 2005.		
Quality assurance methods that ensure the acquisition of exit competences	Quality assurance will be performed at three levels: (1) University Level; (2) Faculty Level by Quality Control Committee; (3) Lecturer's Level.		
Other (as the proposer wishes to add)			

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">Physical Chemistry</td></tr>
<tr><td>Code</td><td>KMF107</td><td>Year of study</td><td colspan="4">1ST year study of pharmacy</td></tr>
<tr><td>Course teacher</td><td>Associate Professor Renato Tomaš, PhD</td><td>Credits (ECTS)</td><td colspan="4">7.5 ECTS</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>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="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">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="6">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="6">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="6">✓ <u>45 hours of lectures:</u>
Introduction: Physical chemistry - course contents. Basic terms. System and surroundings. Intensive and extensive thermodynamic variables. Progress of the reaction. Zeroth low of thermodynamics. (2 hours)
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. (2 hours)
First law of thermodynamics: Work and heat. Internal energy. Enthalpy. Heat capacities. Joule-Thomson expansion. Adiabatic processes with gases. Thermochemistry. Enthalpy of formation. Calorimetry. (4 hours)
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. (6 hours)
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. (3 hours)
Properties of mixtures: Partial molar properties. Gibbs-Duhem equation. The</td></tr>
</table>

<table>
<tr><td></td><td colspan="6">chemical potentials of liquids. Spontaneous mixing. Ideal solutions. Ideal-dilute solutions. Real solutions: activities. Colligative properties. Phase diagrams of mixtures. (3 hours)
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. (4 hours)
Ionic equilibria: Activity of electrolytes. Debye-Hückel theory. Proton transfer equilibria. Salts in water. Solubility equilibria. (3 hours)
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. Potentiometric titrations. (4 hours)
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. Michaelis-Menten mechanism. (3 hours)
Properties of surfaces: Properties of liquid surfaces. Adsorption on solid surfaces. Adsorption isotherms. Laser light scatering method. Catalytic activity at surfaces. (2 hours)
The theory of disperse systems: Molecular disperse system. Colloidal disperse system. Coarse disperse system. Physical stability of disperse systems. Kinetic properties of disperse systems. Sedimentation rate. Viscosity. Electrical properties of disperse systems. (2 hours)
Methods of characterizing farmaceuticals: Crystalline and amorphous solids. Solvates and hydrates. X-ray diffraction methods. Thermogravimetric analysis. Differential scanning calorimetry. IR-spectroscopy. (3 hours)
✓ <u>15 hours of seminars:</u>
Solving numerical problems in physical chemistry.
✓ <u>45 hours of experimental work:</u>
By working out <u>9 exercises</u> student evidences in practice some of the principles presented through lectures and seminars: Vapour pressure of pure liquid. Adsorption from aqueous solution. Coligative properties. Viscosity. Refractometry. Chemical equilibrium. Conductivity and conductometric titration. Potentiometric redox titration. Kinetics of inversion saccharose by polarimetric method.</td></tr>
<tr><td>Format of instruction</td><td colspan="3"><u>☐lectures</u>
<u>☐seminars and workshops</u>
<u>☐exercises</u>
☐on linein entirety
☐partial e-learning
☐field work</td><td colspan="3"><u>☐independent assignments</u>
<u>☐multimedia</u>
<u>☐laboratory</u>
☐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.
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>Screening student work(name the</td><td>Class attendance</td><td>2</td><td>Oral exam</td><td>1</td><td>Practical training</td><td></td></tr>
</table>

proportion of ECTS credits for eachactivity so that the total number of ECTS credits is equal to the ECTS value of the course)	Consultations	0.2	Experimental work	1.5	(Other)	
	Tests	2	Seminar essay		(Other)	
	Written exam	0.8			(Other)	

Grading and evaluating student work in class and at the final exam	Continually evaluation: (success (%) / share in evaluating (%): • presence and activities in the classroom: (70 - 100 / 10) • laboratory exercises: (100 / 20) • first partial test: (60 - 100 / 35) • second partial test: (60 - 100 / 35) 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)

	Title	**Number of copies in the library**	**Availability via other media**
Required literature (available in the library and via other media)	H. Moynihan, A. Crean, The Physicochemical Basis of Pharmaceuticals, Oxford University Press, Oxford, New York, 2009.	1	
	R. J. Silbey, R. A. Alberty, M. G. Bawendi, Physical Chemistry, 4th Edition, John Wiley and Sons, New Jersey, 2005.	1	
	R. Tomaš, Predavanja iz fizikalne kemije za studente farmacije, ppt-prezentacija, 2011.		digitalni zapis
	P. Atkins, J. de Paula, Elements of Physical Chemistry, 4th Edition, Oxford University Press, Oxford, 2005.	2	
	J. Radošević, Lj. Aljinović, Fizikalna kemija, Laboratorijske vježbe, Sveučilišna naklada Liber, Split, 1980.	25	

Optional literature (at the time of submission of study programme proposal)	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.
Quality assurance methods that ensure the acquisition of exit competences	- monitoring suggestions and reactions of participants during the semester - student survey
Other (as the proposer wishes to add)	

NAME OF THE COURSE	Pharmaceutical Botany					
Code	KMF108	Year of study	1.			
Course teacher	PhD Valerija Dunkić, associated professor	Credits (ECTS)	5			
Associate teachers	PhD Mirko Ruščić, assistant professor	Type of instruction (number of hours)	L	S	E	F
			30		30	
Status of the course	Mandatory	Percentage of application of e-learning				

COURSE DESCRIPTION

Course objectives	Students learn to: • Knowledge of morphological and anatomical structure of plant cells, tissues and organs • The classification of plants systematic • Understand the basic metabolic principles in order to know the major secondary metabolites important for pharmaceutical applications
Course enrolment requirements and entry competences required for the course	Passed exam Biology of Plants and Animals
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will after the course unit power: • Identify the meaning and structure of plant organisms in relation to the environment • master the basic knowledge of systematic botany • Know the basic physiological and biochemical processes in plants • Linking botanical knowledge important for pharmaceutical applications

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

Content	L	E
Introduction, specific plant cells Ergastic substances, starch, starch types and occurrence Vacuoles, excretory and secretory substances	3	3
Structure of plant cell and chemistry of protoplasm and cell wall. The stage of morphological organisation.	3	3
Plant tissues: meristem and mature tissues. Anatomy of vegetative body: leaf, stem and root. Adaptation of the plant to specific habitats and changed in inner structures.	3	3
Primary and secondary growth and anatomy of monocotyledons, dicotyledons and conifers.	3	3
Morphology and adaptation of vegetative body: leaf, stem and root.	3	3
Sexually and nonsexual propagate. Development of seed, fruit and types of fruit.	3	3
Plant systematics, plant nomenclature Bryophyta, Pteridophyta	3	3
Spermatophyta - Conipherophytina, Cycadophytina	3	3
Magnoliophytina – Magnoliatae – Magnoliidae, Hamamelididae	3	3
Dilleniidae, Caryophyllidae, Rosidae, Asteridae, -Liliatae	3	3

Format of	☐ lectures	☐ independent assignments

<table>
<tr><td>instruction</td><td colspan="6">☐ seminars and workshops
☐ exercises
☐ on line in entirety
☐ partial e-learning
☐ field work</td><td colspan="2">☐ multimedia
☐ laboratory
☐ work with mentor
☐ (other)</td></tr>
<tr><td>Student responsibilities</td><td colspan="8">. Admission to the lectures at least 70% and 100% of scheduled exercise classes.</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>2</td><td>Research</td><td></td><td>Practical training</td><td>1</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>1</td><td>Oral exam</td><td></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="8">Students are obligated to do all the exercises and making herbarium, and take two written tests or the final exam during the exam period.</td></tr>
<tr><td rowspan="10">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">D. Denffer & H. Ziegler: Botanika (Morfologija i Fiziologija), Školska knjiga, Zagreb, 1982.</td><td></td><td></td></tr>
<tr><td colspan="5">B. G. Bowes: Plant Structure, Manson Publishing Ltd, London, 1996.</td><td></td><td></td></tr>
<tr><td colspan="5">A. Fahn: Plant Anatomy, Pergamon Press, Oxford-NewYork-Toronto, Sydney, Pariz, Frankfurt, 1990.</td><td></td><td></td></tr>
<tr><td colspan="5">B. P. Kozlina: Fiziologija bilja, Profil, Zagreb, 2003</td><td></td><td></td></tr>
<tr><td colspan="5"></td><td></td><td></td></tr>
<tr><td colspan="5"></td><td></td><td></td></tr>
<tr><td colspan="5"></td><td></td><td></td></tr>
<tr><td colspan="5"></td><td></td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="8">D. Kuštrak, Farmakognozija - fitofarmacija, Golden marketing - Tehnička knjiga d.d., 2005.; Paul M Dewick, Medicinal Natural Products, A Biosynthetic Approach, John Wiley & Sons Ltd., 2002; Bruneton J., Pharmacognosy, Phytochemistry, Medicinal Plants, 3rd edition, Tec & Doc Lavoisier, Paris,</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="8">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="8"></td></tr>
</table>

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">Human Anatomy and Histology</td></tr>
<tr><td>Code</td><td>KMF109</td><td>Year of study</td><td colspan="4">1st</td></tr>
<tr><td>Course teacher</td><td>prof.dr.sc. Katarina Vukojević,

Assist, prof. .dr.sc. Sandra Kostić</td><td>Credits (ECTS)</td><td colspan="4">5.5</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Prof.dr.sc. Ivica Grković

prof.dr.sc. Damir Sapunar

izv.prof.dr.sc. Livia Puljak

doc.dr.sc. Snježana Mardešić

doc.dr.sc. Natalija Filipović</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>T</td></tr>
<tr><td>30</td><td>15</td><td>30</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">0%</td></tr>
<tr><td colspan="6">COURSE DESCRIPTION</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="5">Not applicable.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="5">- Describe and explain development of the human body.
- Identify and explain specific periods in the development: embryonic and fetal periods.
- Identify, name and describe anomalies in the human body development.
- Identify, name and describe the morphologic characteristics of the tissues and organs.
- Compare the similarities and differences in the morphology of the tissues and organs.
- Prepare the histological slides using the appropriate methodology.
- Describe the normal microscopic anatomy of the human body, and use the acquired knowledge for understanding and predicting the function of the specific organs and tissues in the body.
- Describe and explain the morphologic characteristics of the organs and tissues and use the acquired knowledge for understanding and predicting morphologic and pathologic changes in the tissues at the microscopic level.
(1) to be able to recognize, manipulate, orient/site, group together, pull apart:
(a) exposed anatomical structures and regions (specimens and models),
(b) surface markings on normal living bodies,
(c) structures on cut sections of normal isolated and in-situ viscera,
(d) sections of the body at important levels and planes.
(2) communication skills (oral) to describe and explain (on daily basis) anatomical characteristics of normal structures,</td></tr>
<tr><td>Course content broken down in detail by weekly</td><td colspan="5">Human anatomy studies normal structure of the human body. The aims include covering the description of macroscopic characteristics of the principle body organs (including their supply). In a systemic approach organs are grouped according to</td></tr>
</table>

<table>
<tr><td>class schedule (syllabus)</td><td colspan="6">their common function. The focus of teaching is on the basic an common anatomical principles important for understanding the structure and the function of the human body. In addition to the systemic approach, the topographic anatomy is also represented and includes studying of characteristics of organs and organ systems in relation to their position in the body and their relations to the nearby structures. In topographic (regional) approach the organs are grouped according to their location and position in the body.
In practice all organs belong to an anatomical region and are part of a body system. Teaching units are organized so they cover topographic anatomy of the head, neck, upper limb, trunk and lower limb.
General and special embryology, general and special histology.</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
☒ microscopy cabinet and anatomical section cabinet</td></tr>
<tr><td>Student responsibilities</td><td colspan="6">In accordance to Rules of studying and Deontological code for USSM students.</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></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></td><td>Oral exam</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td>5.5</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">Continuous assessment during the duration of teaching block, partial written exams, final written, practical and oral examinations.</td></tr>
<tr><td rowspan="9">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">Saraga-Babić M, Puljak L, Mardešić S, Kostić S, Sapunar D. Embriologija i histologija čovjeka. Sveučilišni odjel zdravstvenih studija, Sveučilište u Splitu, 2014.</td><td></td><td></td></tr>
<tr><td colspan="3">Sapunar D, Saraga Babić M. Histološki atlas – CD izdanje. Split: Medicinski fakultet u Splitu</td><td></td><td>Yes</td></tr>
<tr><td colspan="3">S. Bajek, D. Bobinac, R. Jerković, Malnar, I. Marić, Sustavna anatomija čovjeka, Udžbenici Sveučilišta u Rijeci, Rijeka, 2007.; F. H. Netter, Atlas</td><td>5</td><td></td></tr>
<tr><td colspan="3"></td><td></td><td></td></tr>
<tr><td colspan="3"></td><td></td><td></td></tr>
<tr><td colspan="3"></td><td></td><td></td></tr>
<tr><td colspan="3"></td><td></td><td></td></tr>
<tr><td colspan="3"></td><td></td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study</td><td colspan="6">ODABRANA POGLAVLJA IZ UDŽBENIKA:
- Junqueira LC, Carneiro J, Kelley RO. Osnove histologije. Zagreb: Školska knjiga.
- Sadler TW. Medicinska embriologija. Zagreb: Školska knjiga.</td></tr>
</table>

programme proposal)	ATLAS: - J. Sobotta, Histološki atlas, Zagreb, Naklada Slap 2004.; J. Sobotta, Atlas anatomije čovjeka, Svezak 1 & 2, Naklada Slap, 2000.
Quality assurance methods that ensure the acquisition of exit competences	▪ Teaching quality analysis by students and teachers ▪ Exam passing rate analysis ▪ Committee for control of teaching reports ▪ External evaluation
Other (as the proposer wishes to add)	

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="6">Pharmaceutical nomenclature</td></tr>
<tr><td>Code</td><td>KMF110</td><td>Year of study</td><td colspan="4">1st</td></tr>
<tr><td>Course teacher</td><td>prof.dr.sc. Siniša Tomić.</td><td>Credits (ECTS)</td><td colspan="4">2.0</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>T</td></tr>
<tr><td>30</td><td>0</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">0%</td></tr>
<tr><td colspan="6">COURSE DESCRIPTION</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="5">Not applicable.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="5">1. To correctly apply linguistic knowledge in their professional communication and expression

2. To skilfully and expertly compose and execute words in pharmaceutical science and practice. These will include names of chemical elements and compounds, ions, radicals, isomers, plant drugs and medicinal preparations; also of routes of drug administration and storages; as well as of the composition of chemical formulae

3. To choose one of the extant versions of names and pronunciations as the recommended form, which will then be used in the standardization of the pharmaceutical language

4. To begin to appreciate difficulties in the harmonization of the nomenclature rules with established customs in inorganic, organic, biological, macromolecular and pharmaceutical chemistry.</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="5">Pharmaceutical lexicography. Characteristics of the standard language, loanwords and foreign words, semi-compound words and nomenclature rules. Formation of terms and adjectival names: chemical elements, isotopes, atoms, group names of similar atoms, cations, anions, addition compounds, organic and inorganic acids, esters, amines and ammonium salts. Terms in Croatian pharmacopeia. International non-proprietary names of pharmaceutical substances (INNs). Anatomical therapeutic chemical (ATC) classification of drugs, active substances, pharmaceutical forms and packaging. Pharmacopeial orthography: punctuation, numerical prefixes, the order of prefixes, brackets, use of italic. Graphic representation of chemical formulae of pharmaceutical substances, additional marks/labels in formulae. Trade texts and writing style.</td></tr>
<tr><td>Format of instruction</td><td colspan="2">☒ lectures
☐ seminars and workshops
☐ exercises
☐ on line in 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">☒ consultation</td></tr>
<tr><td>Student responsibilities</td><td colspan="8">In accordance to Rules of studying and Deontological code for USSM students.</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</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></td><td>Oral exam</td><td></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="8">Written examination.</td></tr>
<tr><td rowspan="8">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">Hrvatska farmakopeja s komentarima 2007</td><td>5</td><td></td></tr>
<tr><td colspan="5">Hrvatska farmakopeja 2007</td><td>0</td><td>Yes</td></tr>
<tr><td colspan="5"></td><td></td><td></td></tr>
<tr><td colspan="5"></td><td></td><td></td></tr>
<tr><td colspan="5"></td><td></td><td></td></tr>
<tr><td colspan="5"></td><td></td><td></td></tr>
<tr><td colspan="5"></td><td></td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="8">V. Grdinić, Hrvatsko farmakopejsko nazivlje: prinosi za hrvatsku jezičnu normu i kodifikaciju u ljekopisu, Hrvatski zavod za kontrolu lijekova, Zagreb, 1995.;

V. Grdinić, Terminološko-rječnički vodič za HRF, Agencija za lijekove i medicinske proizvode, Zagreb, 2007.;

V. Grdinić, R. Jurišić, I. Šugar, Enciklopedijski englesko-hrvatski farmakognozijski rječnik farmakopejskog nazivlja, Hrvatski zavod za kontrolu lijekova, Zagreb, 1999.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="8">▪ Teaching quality analysis by students and teachers
▪ Exam passing rate analysis
▪ Committee for control of teaching reports
▪ External evaluation</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="8"></td></tr>
</table>

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="6">Safety in Laboratory</td></tr>
<tr><td>Code</td><td>KMTF1</td><td>Year of study</td><td colspan="5">1.</td></tr>
<tr><td>Course teacher</td><td>Prof. Ph. D.Pero Dabić</td><td>Credits (ECTS)</td><td colspan="5">3.0</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>-</td><td>-</td><td>-</td></tr>
<tr><td>Status of the course</td><td>Optional</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">- Knowledge about the potential hazards working in the lab
- The basics of working in a safe manner, safeguards and protective devices and agents at work</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">None.</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:
- Rules of conduct and work in a chemistry lab
- The primary hazards in a chemistry lab
- Ways of substances, meaning of chemical cards (data on physico-chemical, physiological and toxicological properties of the substance)
- Self-interpretation and compilation of chemical cards
- Assessment of the potential dangers of certain chemicals and working safely with the apparatuses and methods</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="6">1st and 2nd hour: An introductory lecture, legislation, codes of conduct in the laboratory
3rd and 4th hour: Safety devices in a chemistry lab
5th and 6th hour: Security and physico-chemical properties of the substance
7th and 8th hour: Classification of substances with similar properties and functionalities
9th and 10th hour: Labeling of the substance - labels, graphic symbols, diamond of hazard label during transport
11th and 12th hour: Effect of pollutants on human health - basic concepts of toxicology and physiological properties of matter, MDK, LD50
13th and 14th hour: Chemical cards of harmful and dangerous substances
15th and 16th hour: Effect of pollutants on human health - classification and characteristics of the substance to physiological properties
17th and 18th hour: Combustion processes and fire danger
19th and 20th hour: Apparatus and facilities for fire fighting
21th and 22th hour: Types of harmful atmosphere and breathing apparatus
23th and 24th hour: Protection from electric shock
25th and 26th hour: Dangerous products - formation, classification according to UN figures, storage, recycling and wastes
27th and 28th hour: The repetition of important issues of the course, the students questions
29th and 30th hour: Written examination</td></tr>
<tr><td>Format of instruction</td><td colspan="3">x lectures
☐ seminars and workshops
☐ exercises</td><td colspan="3">☐ independent assignments
x multimedia
☐ laboratory</td></tr>
</table>

	☐ *on line* in entirety ☐ partial e-learning ☐ field work	☐ work with mentor ☐ (other)
Student responsibilities	Attending lectures in the 80% amount.	

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		Practical training	
	Experimental work		Report		(Other)	
	Essay		Seminar essay		(Other)	
	Tests		Oral exam		(Other)	
	Written exam	1.0	Project		(Other)	

Grading and evaluating student work in class and at the final exam	Continuous evaluation: The overall pass the examination after the lecture (cycle courses) through a written exam. Pass rate threshold is 60%. Rating written exam participates with 90% in the overall assessment. The presence of lectures in 80 -100% amount is 10% of the grade. Final evaluation: Students who did not pass the written exam after the derived classes lay the whole subject matter in the regular examination periods. Prague passing is 60% and a written examination form part of the assessment with the 90%. Rating: sufficient (60-70%), good (71-80%), very good (81-90%), excellent (91-100%).

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	2.6. *R. H. Hill, D.C. Finster, Laboratory Safety for Chemistry Students, John Wiley & Sons, Hoboken, New Jersey, 2010.*	1	
	P. Dabić_Sigurnost pri radu_Autorizirana predavanja za preddiplomski studij, 2013.	1	Web site KTF

Optional literature (at the time of submission of study programme proposal)	- B. Uhlik, Zaštita od požarno opasnih, toksičnih i reaktivnih tvari (I-IV), Hrvatsko društvo kemijskih inženjera, Zagreb, 1998., 2000., 2003. i 2013. - Zakon o zaštiti na radu, Zavod za istraživanje i razvoj sigurnosti, Zagreb, 2010.
Quality assurance methods that ensure the acquisition of exit competences	- Keeping records of class attendance - Annual performance and analysis examination - Monitoring suggestions and reactions of participants during the semester - Student survey
Other (as the proposer wishes to add)	

Course name	History of pharmacy

Code	KMFI2		
Type	Lectures, seminars, exercises (30+0+0)		
Level	Basic level		
Year	1st year	**Semester**	I. or II.
ECTS (with adequate explanation)	3.0		
Instructor	Dr. Stella Fatović-Ferenčić, associate professor		
Competencies to be acquired	*Goal of the course* The goal of the course is to introduce students to the formation and development of pharmacy in the past. The purpose is to learn the history of pharmacy as an important bearer of a prominent and respectable health profession and science. The short programme of the course consists of a study of the material and spiritual heritage of pharmacy from its early beginnings to the modern era. The study includes the key phenomena, events, people and endeavours, mostly from the history of European pharmacy. The course systematically examines how the way of life and the social community changed in response to the knowledge of substances and phenomena acquired by pharmaceutical experience. Croatian pharmaceutical heritage will be studied for the period from late Antiquity to the early twentieth century. *List of skills and competencies* The acquisition of the fact that pharmacy has its material and spiritual basis and that certain facts and events in the past left a smaller or a larger trace in the life and development of pharmacy. Students will learn to understand the interdependence of the material and spiritual basis of pharmacy. Pharmacy first developed as an activity, then as an independent profession, and finally, under certain circumstances, as an independent science that throughout its history was more or less connected with natural sciences and medicine.		
Course requirements	-		
Content	Pharmacy and *materia medica* in Antiquity. The Middle Ages and the separation of apothecaries from physicians. Theriac and mandrake. Arabic pharmacy. Salerno. Alchemical pharmaceutical laboratory in the Renaissance (1420–1527), the influence of Paracelsus and the first pharmacopeias. The development of		

	pharmacopeias. Medications of the pre-iatrochemic era. Famous pharmacists of the seventeenth and eighteenth centuries. Pharmacy in the turn of the nineteenth century, Croatian National Revival and medications of the nineteenth century. Transition from apothecary practice to pharmaceutical science. The development of pharmacy in the twentieth century. Phenomenological, gnoseological and sociological perspectives in the history of pharmacy.
Recommended literature	V. Grdinić, Ilustrirana povijest hrvatskoga ljekarništva, Ljekarništvo na tlu Hrvatske, dokazi, Nakladni zavod Matice hrvatske, Zagreb, 1996; V. Grdinić, Ilustrirana povijest farmakopeje, Medika, Zagreb, 2001.
Additional literature	V. Grdinić, Ogled o kalendaru s rječnikom datuma za farmaceute, Medical Intertrade, Zagreb, 2000; D. L. Cowen, W. H. Helfand, Pharmacy: an illustrated history, H. N. Abrams, New York, 1990; D. Grdenić, Povijest kemije, Novi Liber, Zagreb, 2001.
Forms of instruction	Lectures
Method of knowledge assessment and examination	Written examination
Language (option to study in another language)	Croatian
Method of quality assessment and course performance	The quality and success of the course will be assessed on three levels: (1) university, (2) faculty, by the Committee for the Control of Teaching Quality, (3) instructor level.

Course name	Pharmaceutical museology		
Code	KMFI3		
Type	Lectures, seminars, exercises (30+0+0)		
Level	Basic level		
Year	1st year	**Semester**	I. or II.
ECTS (with adequate explanation)	3.0		
Instructor	Dr. Stella Fatović-Ferenčić, associate professor		
Competencies to be acquired	*Goal of the course* Students of pharmacy have a right to gain an insight into the heritage and the cultural context of their profession. Pharmaceutical museology, as a branch of information sciences, has a role in teaching students how to collect, handle, examine and store pharmaceutical heritage objects, in order to: preserve pharmaceutical heritage, prepare legends for exhibits, interpret them and convey their message. The course offers a systematic review of the typology of pharmaceutical museum objects with respect to their structure, form, source, reality and significance. It furthermore explains the methods of exhibiting museum objects to the public and of preparing legends for exhibits. *List of skills and competencies* The purpose of the course is to train students in viewing museum objects as heritage elements and in relating them to information sciences. Students should learn the language of the object world, forms, materials and structures. They should link the museum objects with archaeology, ethnology, history of art as well as natural and medical sciences. They should acquire the skill of interpreting museum objects as documents of a certain reality, the basis of identity, witnesses of events and results of human skill or natural effect, as well as proofs of a pharmacist's activity. In addition to that, the student will learn to follow theoretical presumptions for the formulation of a system for selecting, documenting, storing, interpreting and communicating/distributing information in pharmaceutical museum practice. This should foster an understanding of preserving and protecting pharmaceutical heritage.		

Course requirements	-
Content	Apothecary museum objects: glass, ceramics, medals, plaques and coins; prints such as apothecary *ex libris*, woodcuts and copper engravings with apothecary themes, medications and reagents from different eras of first use, apothecary utensils and furniture. A review of objects in written form: old manuscripts, recipe collections and pharmacopeias, journals and brochures, scientific and trade literature, recipes, and documents for diplomatic (e.g. diplomas, seals), legal (e.g., health regulations and regulations about medications) and economic (e.g. price lists, account books) history. Understanding the methods of research and display of pharmaceutical museum objects. Pharmaceutical objects in Croatian museums. Private collections. Heritage protection.
Recommended literature	V. Grdinić, Ilustrirana povijest hrvatskoga ljekarništva. Ljekarništvo na tlu Hrvatske: dokazi, Nakladni zavod Matice hrvatske, Zagreb, 1996; V. Grdinić, Ilustrirana povijest farmakopeje, Medika, Zagreb, 2001; J. M. A. Thompson, D. R. Prince, Manual of Curatorship. A Guide to Museum Practice, Butterworths, London, 1984.
Additional literature	V. Grdinić, Vrt ozdravljenja – farmakognozija u hrvatskoj sveučilišnoj farmaciji, Exhibition catalogue, Muzej za umjetnost i obrt, Zagreb, 1996; V. Grdinić, Znanstveni farmaceutski kalendari (1988–2009), Medical Intertrade, Zagreb; V. Grdinić, S. Hajduk, Obljetnice ljekarništva u Varaždinskim Toplicama, Katalog izložbe, Varaždinske toplice, 2000.; V. Pajtlar, V. Grdinić, J., Sumajstorčić, Sto sedamdeseta obljetnica ljekarništva u Sisku (1836–2006), GLJS, Sisak, 2006. V. Grdinić, Farmakopeje u Europi. Hrvatski prinosi, Agencija za lijekove i medicinske proizvode, Zagreb, 2007.
Forms of instruction	Lectures
Method of knowledge assessment and examination	Oral examination
Language (option to study in another language)	Croatian
Method of quality assessment and course performance	The quality and success of the course will be assessed on three levels: (1) university, (2) faculty, by the Committee for the Control of Teaching Quality, (3) instructor level.

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">Social Pharmacy I</td></tr>
<tr><td>Code</td><td>KMFI4</td><td>Year of study</td><td colspan="4">1st</td></tr>
<tr><td>Course teacher</td><td>Dr.sc. Arijana Meštrović, lecturer</td><td>Credits (ECTS)</td><td colspan="4">3.0</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>T</td></tr>
<tr><td>30</td><td></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="4">0%</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">Not applicable.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">1. To define and describe the role of pharmacists and pharmacist’s activity in the society

2. To name and distuingish specific, more vulnerable group of patients

3. To describe the activitiy of Croatian Pharmaceutical Society, Croatian Pharmaceutical Chamber, Croatian Agency for Medicines and Medical Products, Croatian Fund for Health Insurance, World Health Organization, International Pharmaceutica Federation.

4. To define health, ilnerss, prevention, therapy

5. To describe the basic characteristics and levels of collaborative practice in the healthcare system</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="6">The creative force of pharmacy. The role of apothecaries/pharmacists in the society. The role of medications in the society. Pharmacy focused on individuals, groups and society. Pharmacists’ responsibilities. The educational and informational role of the pharmacist. The pharmacists as an advisor to patients and other consumers of drugs. The relationships of pharmacists with other health professions. Affinities and abilities, choice of the profession. Health and illness, epidemics, pandemics. Disease prevention. Health requirements of different social and age groups. Expansion of the pharmacist’s role: from ‘invisible’ health-protection profession to a key member of the medical team. Health insurance. Drug dependence and addiction (abuse). Patients and recipes. Pharmacoepidemiology. Problems arising from the use of drugs. Models of the communication relationship between the pharmacist and the patient.</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒ lectures
☐ seminars and workshops
☐ exercises
☐ on line in entirety
☐ partial e-learning</td><td colspan="3">☒ independent assignments
☐ multimedia
☐ laboratory
☐ work with mentor
☐ (other)</td></tr>
</table>

<table>
<tr><td></td><td colspan="6">☐ field work</td><td></td></tr>
<tr><td>Student responsibilities</td><td colspan="7">In accordance to Rules of studying and Deontological code for USSM students.</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></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></td><td>Oral exam</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td>1,5</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="7">Written test.</td></tr>
<tr><td rowspan="11">Required literature (available in the library and via other media)</td><td colspan="4">Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td colspan="4">V. Grdinić, J. Vuković, Farmaceutska etika, deontologija i praksa, Jadran – Galenski laboratorij, Zagreb, 2000</td><td></td><td></td></tr>
<tr><td colspan="4">G. Harding, S. Nettleton, K. Taylor (ed.), Social pharmacy, The pharmaceutical press, London, 1994.</td><td></td><td></td></tr>
<tr><td colspan="4">G. Urdang, Uloga farmacije u društvu, Hrvatsko farmaceutsko društvo, Zagreb, 1954</td><td></td><td></td></tr>
<tr><td colspan="4"></td><td></td><td></td></tr>
<tr><td colspan="4"></td><td></td><td></td></tr>
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<tr><td colspan="4"></td><td></td><td></td></tr>
<tr><td colspan="4"></td><td></td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="7"></td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="7">▪ Teaching quality analysis by students and teachers
▪ Exam passing rate analysis
▪ Committee for control of teaching reports
▪ External evaluation</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="7"></td></tr>
</table>

Course title	Health ecology		
Course code	KMFI5		
Type of course	Lectures, seminars, exercises (30+0+0)		
Level of course	elective		
Year of study	1st year	**Semester**	I. or II.
ECTS (Number of credits allocated)	3.0		
Name of lecturer	Dr. Višnja Katalinić; associate professor, Dr. Nives Štambuk Giljanović; associate professor, Dr. Katja Čurin, assistant professor		
Learning outcomes and competences	After the completed classes student will understand and be able to monitor the health of individuals and populations in relation to joined impact of environmental factors. The student will have the capacity to identify the environmental health factors, define the mechanisms through which these factors can influence human health and understand the mechanisms of illnes. Student will gain knowledge on the influence of food on public health, understand the significance of clean water, waste disposal, urbanization, change of feeding habits and the dangers connected to industrial acitivities. He/she will learn to appreciate the importance of multidisciplinary team work on gathering and analyzing data, aiming to estimate the exposure to environmental factors and the resultant health risk, all based on the need to improve public health protection.		
Prerequisites	-		
Course contents	Introduction: Health ecology as part of ecological sciences. Ecological approach in understanding health and disease. Global ecological health issues. Most important physical, chemical and biological factors which lead to disease. Assessment of health risks induced by chemical environmental factors. Ecological health standards and related law regulations. Gathering and analyzing data. Limiting values, acceptable risk. Chemical environmental factors: air, water and soil pollution; health imacts of metals, pesticides, aerosol and gasses. Physical environmental factors: health impacts, risk assessment, reduction of noise, heat and light. Mutagenic and carcinogenic substances in the environment. Health, genes and environment. Reproduction and environment. Water and health: health impacts of water pollution, protection of water in nature, drinking water supply, sanitary surveillance of drinking water. Public health aspects of medical and dangerous waste. Inhabitation and health. Nutrition and health: actual themes. Planning and evolution of nutrition. Public		

	health significance of nutrition. Surveillance of food quality and caterer validity. Food chain safety. Nutrition in extraordinary conditions. Ecological catastrophes. Actual ecological issues.
Recommended reading	F. Valić i sur., Zdravstvena ekologija, Medicinska naklada, Zagreb, 2001.
Supplementary reading	O. P. Springer, Ekološki leksikon, Zagreb, Barbat, Ministarstvo okoliša i prostornog uređenja RH, 2001.; A. Senta, J. Pucarin-Cvetković, D. Jelinić, Kvantitativni modeli namirnica i obroka, Medicinska naklada, Zagreb 2002.; Environmental Health Criteria: World Health Organization publikacije; Natuknice uz predavanja
Teaching methods	Lectures, seminars, field work, laboratory exercises
Assessment methods	Written and oral examination.
Language of instruction	Croatian; English
Quality assurance methods	Quality assurance will be performed at three levels: (1) University Level, (2) Faculty Level by Quality Control Committee, (3) Lecturer's Level

Course title	Pharmaceutical marketing		
Course code	KMFI06		
Type of course	Lectures, tutorial sessions (30+0+0)		
Level of course	elective		
Year of study	1st year	**Semester**	I. or II.
ECTS (Number of credits allocated)	3.0		
Name of lecturers	Dr. Biljana Crnjak-Karanović, full professor		
Learning outcomes and competences	After the completion of the course, the student is expected to demonstrate comprehension of the marketing concept, have clear understanding of its role and importance in the society as a whole, with particular emphasis on pharmaceutical industry. Student will develop an understanding and the ability to analyse various market situations which can be encountered in business. Student will be expected to master specific knowledge relevant for understanding the specificities of business practices within, and specific influences related to pharmaceutical industry.		
Prerequisites	-		
Course contents	The nature of marketing: basic principles and dimensions of marketing. Fundamentals of marketing concept, marketing philosophy and approaches to business management (starting point, focus, resources and aims) Marketing environment: forces in firm's environment and their influence on firm's capability to serve its target market. Key elements of marketing environment in pharmaceutical industry context and specificities of marketing environment in the Republic of Croatia. Research and analysis of market opportunities: Basic ideas in marketing research, consumer behaviour and business consumer behaviour. Market segmentation and target marketing. Marketing mix - Product (Product dimensions, New product development and acceptance; Product life cycle concept with an emphasis on pharmaceutical industry specificities; branding in pharmaceuticals) Marketing mix - sales and distribution (Choice and management of marketing channels, specificities of channel organisation in pharmaceutical marketing; Role of wholesale distributors, pharmacies, clinics and hospitals as channel		

	members); Marketing mix – Pricing (Essential factors in the pricing decision-making, competition, value of therapy, pricing strategies). Marketing mix – Promotion (Marketing communication and promotional mix; Promotion management and the process of communication; Promotion strategies; Specificities of prescription and OTC drugs promotion; Role of personal selling)
Recommended reading	P. Kotler et al., "Osnove marketinga", MATE, Zagreb 2006.; C. M. Smith (ed.), Pharmaceutical Marketing: Principles, Environment, and Practice, Haworth Press Inc., 2002.
Supplementary reading	J. Previšić and Đ. Ozretić-Došen, Marketing, Zagerb,2006. ; ADVERTA, R.; Mullner, Pharmaceutical Marketing, Emerald Group Publishing Ltd., 2006.
Teaching methods	Lectures, seminars, case studies.
Assessment methods	Assignments, Written exam
Language of instruction	Croatian
Quality assurance methods	Quality and effectiveness of programme delivery will be assured on three levels (1) University level, (2) Faculty level through Teaching quality control commission, (3) Lecturer level

NAME OF THE COURSE	Analytical Chemistry II					
Code	KMF201	Year of study	2.			
Course teacher	Doc. dr. sc. Lea Kukoč Modun	Credits (ECTS)	6.0			
Associate teachers	Maja Biočić, mag. ing. chem. ing. Andea Anđić, mag. chem. Azra Đulović, mag. chem.	Type of instruction (number of hours)	L	S	E	F
			30	15	30	
Status of the course	Mandatory	Percentage of application of e-learning	0 %			

COURSE DESCRIPTION	
Course objectives	The goal of course is to familiarize students with the mechanisms and equilibrium of heterogeneous chemical reactions and their applications in analytical methods for determining and separation process. Theoretical basis of kinetic methods of analysis will be explained, and the
Course enrolment requirements and entry competences required for the course	Analytical Chemistry I
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	1. Distinguish types of heterogeneous equilibrium, and define analytical methods for determining and / or separation that is based on them. 2. Apply separation of ions controlling the concentration of precipitating reagent. 3. Define and apply the precipitation requirements. 4. Calculate and predict the precipitation titration curve. Apply precipitation titration based on theoretical predictions. 5. Compare and explain the different effects of simple single and multiple extractions. 6. Explain the basic theoretical principles of chromatography. 7. Specify the application of ion exchangers in the analytical laboratory and expose the success of the separation of metal ions from solution using an ion-exchanger. 8. Compare kinetic methods of analysis and classical analytical methods based on thermodynamic equilibrium, in terms of selectivity and application options. 9. Solve numerically analytical problems. 10. Plan and implement chemical experiment on the basis of theoretical knowledge and predictions based on calculations.
Course content broken down in detail by weekly class schedule (syllabus)	Lectures: L 1,2: Heterogeneous equilibrium. L 3,4: Equilibrium between solid, slightly soluble salts and their ions. L 5,6: Ionic strength effect, common ion effect and the effect of parallel reactions on salt solubility. L 7,8: Separation by precipitation. L 9,10: Gravimetric analysis. L 11,12: Precipitation gravimetry, properties of precipitate and precipitation requirements. L 13,14: Precipitation titrations, End –point detection. L 15,16: : Extraction L 17,18: Simple extraction with parallel reactions. L 19,20: Chromatography, planar chromatography. L 21, 22: Column chromatography.

<table>
<tr><td></td><td colspan="6">L 23,24: Review of modern chromatographic techniques.
L 25,26: Ion exchange and their analytical application.
L 27,28: Kinetic method analysis.
L 29,30: Review of methods of determination and separation recommended by the Pharmacopoeia.

Seminars:
S 1: Heterogeneous equilibrium (numerical examples).
S 2: Equilibrium between solid, slightly soluble salts and their ions (numerical examples)
S 3: Ionic strength effect, common ion effect and the effect of parallel reactions on salt solubility (numerical examples).
S 4: Separation by precipitation (numerical examples).
S 5, 6: Gravimetric analysis (numerical examples).
S 7: Precipitation titrations (numerical examples).
S 8: Extraction (numerical examples).
S 9: pH and complex formation effects on extraction efficiency (numerical examples).
S 10,11: Chromatography (numerical examples).
S 12: Chromatography (Pharmacopoeia).
S 13: Ion exchange (numerical examples).
S 14: Kinetic method analysis (numerical examples).
S 15: Pharmacopoeia

Experimental work:
1. (5 hours) Determinations based on heterogeneous equilibrium. Argentometric titration.
2. (5 hours) Gravimetric determination of nickel ion.
3. (5 hours) Qualitative chemical analysis – determination of groups of cations.
4. (5 hours) Determination of cations in separated groups and in a mixed sample.
5. (5 hours) Qualitative chemical analysis – determination of groups of anions.
6. (5 hours) Determination of anions in separated groups and in a mixed sample.</td></tr>
<tr><td>Format of instruction</td><td colspan="3">x lectures
x 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
x team based learning</td></tr>
<tr><td>Studentresponsibilities</td><td colspan="6">The 70% presence at lectures and 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></td><td>Research</td><td></td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td>5 % (0,3 ECTS)</td><td>Report</td><td></td><td>Test of numerical examples</td><td>30 % (1,8 ECTS)</td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>Test of teoretical part</td><td>50 % (3,0 ECTS)</td></tr>
<tr><td>Tests</td><td></td><td>Oral exam</td><td>15 % (0,9 ECTS)</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></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Grading and</td><td colspan="6">Scoring at the exam consists of three basic parts: scoring the experimental part</td></tr>
</table>

<table>
<tr><td>evaluating student work in class and at the final exam</td><td colspan="3">(minimum score 2 , maximum score 4), test of numerical example (minimum score: 18; maximum score: 30) and test of theoretical part (minimum score: 39; maximum score: 65).
Students who had attended lectures and seminar in 70 % can take the exam through partial tests: 2 tests of numerical examples (minimum score: 9; maximum score: 15).
The rating is formed in accordance with the score ranges: sufficient (60 - 70 points), good (71-80 points) , very good (81-90 points) , excellent (≥91points)</td></tr>
<tr><td rowspan="7">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>D.A. Skoog, D.M. West, F.J. Holler, Osnove analitičke kemije, šesto izdanje (englesko), prvo izdanje (hrvatsko), Školska knjiga, Zagreb, 1999.</td><td>18</td><td></td></tr>
<tr><td>Nj. Radić i L. Kukoč Modun, Uvod u analitičku kemiju I. dio, Redak, Split, 2013.</td><td>32</td><td></td></tr>
<tr><td>M. Kaštelan-Macan, Kemijska analiza u sustavu kvalitete, Školska knjiga, Zagreb 2003.</td><td></td><td></td></tr>
<tr><td>European Pharmacopoeia 7th edition, European Directorate for the Quality of Medicines & HealtCare, Council of Europe, Stasbourg 2010.</td><td>1</td><td></td></tr>
<tr><td>A. Prkić, Vježbe iz analitičke kemije, Preddiplomski studij kemijske tehnologije, interna recenzirana skripta, Split, 2008. (odabrana poglavlja)</td><td></td><td>available in digital form</td></tr>
<tr><td>Vježbe iz kvalitativne analitičke kemije, dr. sc. Josipa Komljenović, doc. (odabrana poglavlja)</td><td></td><td>available</td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="3">1. R. Kellner, J. M. Mermet, M. Otto, M. Valcarcel and H. M. Widmer (Urednici), Analytical Chemistry (A Modern Approach to Analytical Science, Second Edition) Wiley-VCHVerlag Gmbh & Co. KGaA, Weinheim, 2004.
2. D. A. Skoog, D. M. West, F. J. Holler and S. R. Crouch, Fundamentals of Analytical Chemistry, Eighth Edition, Thompson Brooks/Cole, Belmont, USA, 2004.
3. G. D.Christian, Analytical Chemistry, Sixth Edition, John Willey & Sons, INC, 2004.
4. D. Harvey, Modern Analytical Chemistry, McGraw-Hill Higher Education, New York, London, 2000.
5. F. W. Fifield & D. Kealey, Principles and Practice of Analytical Chemistry, Blackwell Science Ltd, Malden MA, London, 2000.
6. M. Kaštelan-Macan, Enciklopedijski rječnik analitičkog nazivlja, FKIT, Mentor, Zagreb 2014.
7. D. G. Watson, Pharmaceutical analysis, Elsevier, London 2005.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="3">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="3"></td></tr>
</table>

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="6">Organic Chemistry I</td></tr>
<tr><td>Code</td><td>KMF02</td><td>Year of study</td><td colspan="5">2.</td></tr>
<tr><td>Course teacher</td><td>Dr. Igor Jerković, full prof.</td><td>Credits (ECTS)</td><td colspan="5">8.0</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Dr. Ani Radonić, associate prof., 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>60</td><td>15</td><td>30</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="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">Acquisition of basic knowledge of modern organic chemistry, understanding the structure and properties of organic compounds, nomenclature of organic compounds, the types of isomers, spectroscopic techniques in determining organic structures, understanding the mechanisms of organic reactions of addition, substitution, elimination and rearrangement.</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 course, students will be able to:

• describe the basic concepts, nomenclature of organic compounds, stereochemistry, and typical organic reactions of addition, elimination, substitution and rearrangement
• illustrate modes of applying the nomenclature, isomerism, stereochemistry and mechanisms of organic reactions (ion type and radical type)
• demonstrate fundamental processes in organic-chemical laboratory, simple methods of organic compounds synthesis and determining the functional groups
• determine the structure of simple organic compounds on the basis of spectroscopic methods
• propose mechanisms for nucleophilic substitution reactions at saturated carbon and elimination reactions, additions to the unsaturated carbon and electrophilic aromatic substitution, taking into account the regio-selectivity / specificity and stereo-selectivity / specificity
• choose the correct chemical approach to solving problems in the field of organic chemistry, starting from the acquired knowledge in general, analytical and physical chemistry</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="6">Introduction. A short historical overview. The modern organic chemistry. The binding in organic molecules. Electronegativity and bond types. Quantum mechanics and atomic orbitals. Electronic configuration. Lengths and bond energies. (3 hours); Hybrid atomic orbitals (sp^3, sp^2 and sp). Molecular orbitals (σ- and π-bonds), polar and non-polar covalent bond. Bonding angles. Examples of organic molecules (orbital images) with single, double and triple bond. (3 hours); Physical properties, molecular structure and intermolecular bonds (dipole-dipole, van der Waals and hydrogen bonding). Solubility in organic solvent. Examples. Presentation of organic structures. (3 hours)

Classification and nomenclature of organic compounds. Functional groups and priority order. Alkanes. Alkenes. Alkynes. Aromatic hydrocarbons. Examples of the nomenclature of branched acyclic and cyclic and aromatic hydrocarbons. Alcohols.</td></tr>
</table>

	Phenols. Thiols. (3 hours); Ethers. Thioethers. Amines. Organohalogen compounds. Aldehydes. Ketones. Carboxylic acids. Carboxylic acid derivatives (acyl halides, anhydrides, esters, amides and nitriles). (3 hours); Examples of the nomenclature of various functional groups. (3 hours) **Isomers**. Constitutional isomers. Index of hydrogen deficiency (IHD). The conformation and configuration. Stereoisomers. Conformations of acyclic alkanes (conformational analysis). (3 hours); Conformations of cycloalkanes (angle tension and heat of combustion). Substituted cycloalkanes. Geometric isomers of alkenes, aldoximes, ketoximes and azo compounds (*cis*, *trans*, *E*, *Z*, *sin*, *anti*). CIP rule sequence. (3 hours); Examples of geometric isomers of molecules with multiple double bonds. Geometric isomers of cyclic compounds (*cis*, *trans* isomers conformational structure). Symmetry, chirality and achirality. Stereogenic center (chiral center). Enantiomers. Diastereomers. (3 hours); The absolute configuration. CIP system - rule sequences. Fischer projection formula. The properties of the enantiomers. Optical activity. The racemic mixture. Enantiomeric excess. The optical purity. The biological significance of chirality. Examples of chiral biologically active substances. (3 hours); The separation of the racemate (direct crystallization, converting into diastereomers, chromatographic methods and kinetic resolution). Molecules having multiple stereogenic centers. Relative configuration erythro- and threo. Meso compounds. Stereoisomers of cyclic compounds. Chiral molecules without tetrahedral atoms. Examples of different kinds of stereoisomers. (3 hours) **Determination of organic structures**. Introduction. Mass spectrometry (MS). Resolution. The 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 the IR and NMR spectra. (11 hours) **Types of organic reactions.** Mechanisms. Acid-base reactions. Nucleophiles and electrophiles. Redox reactions. Energy and reaction kinetics. (4 hours) **Nucleophilic substitution at saturated carbon**. S_N2-mechanism. S_N1-mechanism. Energy diagrams. The stereochemistry of the nucleophilic substitution. (3 hours); Variables in the nucleophilic substitution of (leaving group, nucleophile, position of substitution and solvent). Conditions of S_N2 and S_N1-reaction. Competitive reactions. (3 hours); Nucleophilic substitution possibilities, conventional nucleophiles and their products. Examples. **Elimination reactions**. *E1* and *E2* mechanism. Conditions of *E1* and *E2* reactions. Orientation of elimination. The stereochemistry of the elimination (*anti-* or *sin-*) (3 hours); Competition elimination and substitution (reaction process conditions and examples). Examples of elimination reactions: dehydrogen-halogenation, dehalogenation of vicinal dihalogenalkanes, double dehydrogenation, dehydratation of alcohols (*E1* and *E2* mechanism, energy diagrams). (3 hours) **Electrophilic Addition.** Orientation and additions (regioselectivity). The stereochemistry of the addition (*anti-* or *sin-*). Addition of free radicals. The addition of hydrogen. The addition of halogen. Halohydrin reaction. The addition of hydrogen halide. Conditions of Markovnikov and anti-Markovnikov addition. (3 hours); Hydration. Oxymercuration / demercuration. Hydroboration. Epoxidation - hydroxylation. Oxidation of alkenes with $KMnO_4$ and OsO_4. The ozonolysis of alkenes. The addition of alkenes (alkylation). (3 hours); Polymerization (radicals type and ions type). Examples of typical polymers. The additions to alkynes. Examples. Summary of the reaction of alkanes, alkenes, alkynes and halogenoalkanes. (3 hours) Aromatic compounds and antiaromatics. The structure of benzene. Examples. **Mechanism of electrophilic aromatic substitution.** The impact on the groups on electrophilic aromatic substitution. (3 hours); Multiple substitutions of substituted

<table>
<tr><td></td><td colspan="6">aromatic compounds. Arenes. Phenols. Aromatic amines. Examples. (3 hours)

Seminars (1 hour dialy):
Solving problems in organic chemistry.
Exercises (6 lab periods):
1. Laboratory safety and rules. Isolation and purification of organic compounds. Crystallization and melting point determination. Distillation and boiling point determination. (1 lab period)
2. Water/steam distillation. Extraction. (1 lab period)
3. Oxidation-reduction reactions. Butan-2-one synthesis. (1 lab period)
4. Nucleophilic substitution at saturated carbon. tert-Butyl chloride synthesis. (1 lab period)
5. Organic compounds characterization. Elemental analysis. Characteristic reactions of functional groups. (1 lab period)
6. Spectroscopy. Recording and interpretation of UV/VIS and FT-IR spectra of selected organic compounds belonging to different classes. (1 lab period)</td></tr>
<tr><td>Format of instruction</td><td colspan="3">X lectures
X seminars and workshops
X 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">Students are required to attend classes (lectures and seminars) and actively participate in the teaching process, which will be evaluated in the final assessment by the weight coefficient of 5%.</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</td><td>Research</td><td>0</td><td>Practical training</td><td>0</td></tr>
<tr><td>Experimental work</td><td>1</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>0.5</td><td>Oral exam</td><td>0</td><td>(Other)</td><td></td></tr>
<tr><td>Written exam (or partial tests)</td><td>4</td><td>Project</td><td>0</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">Students can take three partial tests during the lectures. If not pass partial tests, students will be evaluated by written exam. Rating at partial tests and the final examination is formed as follows: 51-60% sufficient (2); 61-75% good (3); 76-88% very good (4); 89-100% excellent (5). The total score is formed by summing all activities (for each activity % success multiply weigh coefficient): 5% x the presence and activity in lectures and seminars + 10% x success in experimental work + 32% x performance on the first test + 21% x performance on the second test + 32% x performance on the third test.</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>Availability via other media</td></tr>
<tr><td colspan="3">S. H. Pine: Organska kemija, Školska knjiga, Zagreb, 1994.</td><td>9</td><td>no</td></tr>
<tr><td colspan="3">Morrison and Boyd, Organic Chemistry, 6th edition, Prentice Hall of India, New Delhi, India, 2002.</td><td>2</td><td>no</td></tr>
</table>

	Vodič kroz IUPAC-ovu nomenkalturu organskih spojeva, Školska knjiga Zagreb. 2002.	2	no
	I. Jerković, Predlošci za predavanja iz Organske kemije I, 2014.	0	yes (KTF web page)
	I. Jerković, A. Radonić, Praktikum iz organske kemije, Udžbenici Sveučilišta u Splitu, KTF-Split, 2009.	0	yes (KTF web page)
Optional literature (at the time of submission of study programme proposal)	Clayden, Greeves, Warren and Wothers, Organic Chemistry, Oxford University Press, 2001. S. Borčić, O. Kronja, Praktikum preparativne organske kemije, Školska knjiga Zagreb, 1991.		
Quality assurance methods that ensure the acquisition of exit competences	Monitoring of quality assurance will be performed at three levels: (1) University; (2) Faculty Level by Quality Control Committee; (3) Academic Level.		
Other (as the proposer wishes to add)			

NAME OF THE COURSE	Pharmaceutical Microbiology				
Code	KMF203	Year of study	2.		
Course teacher	Prof. dr. Marija Tonkić	Credits (ECTS)	5.0		
Associate teachers	Doc. dr. Ivana Goić Barišić Dr. sc. Katarina Šiško Kraljević Anita Novak, dr. med. Žana Rubić, dr. med. dr. sc. Vanja Kaliterna Merica Carev, dr. med. Marina Radić, dr. med.	Type of instruction (number of hours)	L	S	E	T
			30	0	30	0
Status of the course	Mandatory	Percentage of application of e-learning	0%			

COURSE DESCRIPTION

Course enrolment requirements and entry competences required for the course	Successful completion of the 1st year of the Program.
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	By the end of this course the students will be able to: 1. State and describe the most important biological characteristics of normal human flora and pathogenic microorganisms, 2. List and explain the effects of the most important factors of virulence of microorganisms that cause infections in people, 3. Describe methods of transmission of microorganisms, pathogenesis and methods of prevention of infectious diseases, 4. Describe the basic mechanisms of immune defense and vaccines, 5. Designate the basic groups of antimicrobials, explain the mechanisms of their action and mechanisms of bacterial resistance to these agents, 6. Critically interpret the results of the antimicrobials sensitivity tests
Course content broken down in detail by weekly class schedule (syllabus)	Bacteriology, Mycology, Virology, Parasitology; Biology of pathogenic as well as opportunistic microorganisms (bacteria, fungi, viruses and parasites), their mode of transmission; their mechanism of disease production and methods of treatment and prevention.
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)
Student responsibilities	In accordance to Rules of studying and Deontological code for USSM students.

Screening student work *(name the proportion of ECTS credits for each activity so that the total number of ECTS credits is*						
	Class attendance	1	Research		Practical training	
	Experimental work		Report		(Other)	
	Essay		Seminar essay		(Other)	
	Tests		Oral exam		(Other)	

equal to the ECTS value of the course)	Written exam	4	Project		(Other)	
Grading and evaluating student work in class and at the final exam	Written examination.					

	Title	Number of copies in the library	Availability via other media
Required literature (available in the library and via other media)	Kalenić S, Mlinarić-Missoni E. i sur. Medicinska bakteriologija i mikologija, 2. izd. Zagreb, MERKUR A. B. D., 2001.	15	
	Presečki V. i sur. Virologija. Zagreb, Medicinska naklada, 2002.	15	
	Richter B. Medicinska parasitolologija. 6. izd. Zagreb, MERKUR A. B. D., 2002.	15	

Optional literature (at the time of submission of study programme proposal)	1. Murray PR, Rosenthal KS, Pfaller MA. Medical Microbiology. 6th ed. Philadelphia: Mosby, Elsevier; 2009.
Quality assurance methods that ensure the acquisition of exit competences	▪ Teaching quality analysis by students and teachers ▪ Exam passing rate analysis ▪ Committee for control of teaching reports ▪ External evaluation
Other (as the proposer wishes to add)	

NAME OF THE COURSE	Physiology					
Code	KMF204	Year of study	2nd			
Course teacher	Prof. dr. Zoran Valić	Credits (ECTS)	8,0			
Associate teachers	Prof. dr. Željko Dujić Prof. dr. Marko Ljubković Prof. dr. Jasna Marinović Prof. dr. Darija Baković Doc. dr. Ante Obad Doc. dr. Vladimir Ivančev Prof. dr. Zoran Đogaš Prof. dr. Maja Valić	Type of instruction (number of hours)	L	S	E	T
			45	45	15	0
Status of the course	Mandatory	Percentage of application of e-learning	0%			

COURSE DESCRIPTION

Course enrolment requirements and entry competences required for the course	Passed exams from the first year of the Program.
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Identify, describe and explain the most important characteristics of neuromuscular, cardiovascular, respiratory, kidney, gastrointestinal and endocrine system at the level of the cell, organ and whole body. Describe, discriminate and explain control mechanisms (negative and positive feedback loops) critical for homeostasis. Name and explain changes that occur in each system as a consequence of deviation of parameters within and outside of physiological limits. Critically judge educational materials (textbooks and lectures), participate in argumentative discussions and construct opinions. Apply adopted knowledge to predict function of system in the future. Compare similarities and differences in function between different systems in our body. Use acquired theoretical knowledge for solving practical problems. Perform and practice measurement of selected physiological parameters, and explain collected results. Construct and analyze diagrams showing relations between two or more parameters, predict behavior of the system in changed conditions.
Course content broken down in detail by weekly class schedule (syllabus)	Introduction to physiology, substances in blood and plasma, physiology of the cell, neurophysiology, respiratory physiology, cardiovascular physiology, digestive physiology, kidney physiology, physiology of the endocrine system, overview of the scientific literature
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)
Student responsibilities	In accordance to Rules of studying and Deontological code for USSM students.

Screening student work *(name the proportion of ECTS credits for each*						
	Class attendance		Research		Practical training	
	Experimental work		Report		(Other)	

activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Essay		Seminar essay		(Other)	
	Tests		Oral exam		(Other)	
	Written exam		Project		(Other)	

Grading and evaluating student work in class and at the final exam	In order to take the exam in physiology students have to be present in classes. Exam in physiology consists of both written (test) and oral exam. Written exam consists of 100 questions divided into 2 separate tests. Student is allowed to take oral exam after he/she achieves 60 points on both tests (at least 30 points on each individual test).		
Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	A. C. Guyton and J. E. Hall, Medicinska fiziologija, 12. izd., Medicinska naklada, Zagreb, 2012.	20	
Optional literature (at the time of submission of study programme proposal)	Handouts for exercise		
Quality assurance methods that ensure the acquisition of exit competences	▪ Teaching quality analysis by students and teachers ▪ Exam passing rate analysis ▪ Committee for control of teaching reports ▪ External evaluation		
Other (as the proposer wishes to add)			

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="6">Organic Chemistry II</td></tr>
<tr><td>Code</td><td>KMF205</td><td>Year of study</td><td colspan="5">2.</td></tr>
<tr><td>Course teacher</td><td>PhD, Ani Radonić, Associate Professor</td><td>Credits (ECTS)</td><td colspan="5">6.0</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">PhD, Igor Jerković, Full Professor</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="5"></td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">Acquisition of basic knowledge about chemistry of carbonyl compounds, carboxylic acid and derivatives, heterocycles and carbohydrates.
This course is basis for understanding other courses, such as Pharmaceutical Chemistry I and II and General Biochemistry.</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 students will be able to:
- recognize and give the IUPAC name to carbonyl compounds, carboxylic acids and derivatives, heterocycles and carbohydrates, and draw the corresponding structural formula based on systematic name (apply basic rules of organic compounds nomenclature)
- connect organic compounds molecular structure with their physical and chemical properties and reactivity
- differentiate, describe and compare reaction mechanisms of nucleophilic addition and nucleophilic substitution at carbonyl group, specify the most important reactions of carbonyl and carboxylic compounds
-describe reaction mechanisms of heterocyclic compounds and carbohydrates, specify the most important reactions of these compounds
- solving problems regarding carbonyl compounds, carboxylic acid and derivatives, heterocyclic compounds and carbohydrates
- perform independently laboratory exercises according to laboratory procedures
- propose basic laboratory procedures in accordance with set-up objectives (organic compound synthesis, isolation and purification as well as their characterization and identification)</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="6">Lectures (3 hours daily):

1. Introduction to course (course content, students responsibilities, terms and conditions for passing exam). Nucleophilic aromatic substitution. Addition-elimination mechanism. Elimination-addition mechanism. Aryl cation mechanism.
2. Polycyclic aromatic compounds - sources. Polycyclic aromatic compounds reactions. carbonyl group addition to carbonyl group - introduction. Properties of carbonyl group - nucleophilic and electrophilic reactivity. Electronic and steric effect.
3. Cyanide as a nucleophile (cyanohydrin formation). Oxygen and sulphur as nucleophiles. Addition of alcohols (hemiacetals and acetals formation).
4. Addition of water (hydrates formation). Addition of thiols (hemithioacetals and</td></tr>
</table>

	thioacetals formation). Hydride as a nucleophile - reduction. Reduction by complex metal hydrides. Cannizzaro reaction -disproportionation. 5. Carbon as a nucleophile - organometallic compounds. Organometallic reagents synthesis. Grignard reaction. Syntheses using Grignard reagents. Nitrogen as a nucleophile. Imines. Enamines. Nucleophilic addition to carbonyl related compounds. Nucleophilic addition to imines. Nucleophilic addition to enamines. Nucleophilic addition to nitriles. 6. Nucleophilic acyl substitution - carboxylic acid and derivatives. Introduction. Carboxylic acids and derivatives reactivity, nature of the leaving group, reactivity of leaving groups. Oxygen and sulfur as nucleophiles. Substitution with alcohols - esterification. Lactonization. Transesterification. 7. Substitution with water - hydrolysis. Substitution with thiols. Nitrogen as a nucleophile. Acyl halides and anhydrides. Acyl halide synthesis. Anhydride synthesis. Hydride as a nucleophile - reduction. Carbon as a nucleophile - organometallic reagents. Reactions with esters. Reactions with acyl halides. Reactions with carboxylic acids. 8. Nucleophilic substitution on derivatives of sulfuric and phosphoric acid. Sulfuric acid derivatives. Phosphoric acid derivatives. Nucleophilic reactions involving enolate anions. Enols and enolate anions. Enolization (keto-enol tautomerism). 9. The aldol reaction. Mixed aldol reaction. Dehydration of aldol products. Ester condensation (Claisen condensation). Mixed Claisen condensation. β-dicarbonyl compounds splitting. Reverse Claisen reaction. Hydrolysis. Decarboxylation. 10. Alkylation of enolate anions. Active methylene compounds. Ambident nucleophiles. Other stabilized carbanions. 11. Conjugate addition reactions. Conjugated dienes. Electrophilic conjugate addition. 12. Double bounds conjugated with carbonyl groups - α,β-unsaturated carbonyl compounds. Nucleophilic conjugate addition (Michael reaction). Diels-Alder cycloaddition. 13. Carbohydrates – definition and classification. Cyclic forms of monosaccharides and their representation. Anomeric effect. Reactions of monosaccharides. Oxidation. Reduction. Monosaccharides in aqueous solution (mutarotation). Monosaccharides in alkaline or acidic solution. Epimerization. The aldol and retro-aldol reaction. 14. Nucleophilic addition to monosaccharides carbonyl group. Addition of phenylhydrazines - osazone formation. Wohl and Ruff degradation. Fischer's structure determination of glucose. Determination of ring size. Glycosides. Typical disaccharides and oligosaccharides. Polysaccharides. 15. Heterocyclic compounds (five-membered and six-membered heterocycles). Structures and stability of aromatic heterocycles. Electrophilic and nucleophilic aromatic substitution reactions. Organic synthesis. Organic synthesis planning. Typical synthetic reactions. **Seminars (1 hour dialy):** Solving problems in organic chemistry. **Exercises (6 lab periods):** 1. Electrophilic aromatic substitution. *p*-Nitroacetanilide synthesis. (1 lab period) 2. Nucleophilic aromatic substitution. Diazotation. Phenol synthesis. (2 lab periods) 3. Nucleophilic addition at carbonyl group. The Cannizzaro reaction – benzyl alcohol and benzoic acid synthesis. (1 lab period)

<table>
<tr><td></td><td colspan="6">4. Nucleophilic acyl substitution. Acetysalicylic acid synthesis. Sulfanilamide synthesis. (2 lab periods)</td></tr>
<tr><td>Format of instruction</td><td colspan="3">x lectures
x seminars and workshops
x exercises
☐on linein entirety
☐partial e-learning
☐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">Students are required to attend lectures and seminars in the amount of at least 80% of the times scheduled and complete all laboratory exercises (100% attendance). Active participation in teaching process will be also evaluated in the final score.</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>0.5</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></td><td>(Other)</td><td></td></tr>
<tr><td>Tests</td><td>1.0</td><td>Oral exam</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td>4.0</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">A student can pass the entire exam by taking and passing two partial exams (tests) consisting of theoretical questions and seminar problems during the semester. Test passing score is 60%. Each test constitute 45% of the final exam score. Grades achieved through laboratory exercises will constitute 10% of the final score. Any of the partial exams passed during the semester is valid throughout the academic year.
Students who do not pass one of the partial exam or both of them have to take an written exam in the regular examination periods. Exam passing score is 60%.
Grades depending on the test score: 60% - 69% - satisfactory, 70% -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">Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td colspan="3">S. H. Pine, Organska kemija, Školska knjiga, Zagreb, 1994.</td><td>8</td><td></td></tr>
<tr><td colspan="3">R. T. Morrison, R. N. Boyd, Organska kemija, 3. izdanje, Udžbenici Sveučilišta u Zagrebu, Zagreb, 1979.</td><td>1</td><td></td></tr>
<tr><td colspan="3">I. Jerković, A. Radonić, Praktikum iz organske kemije, Udžbenici Sveučilišta u Splitu, Split, 2009.</td><td></td><td>Yes, institution web site</td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="6">T. W. Solomons & C. B. Fryhle, Organic Chemistry, John Wiley & Sons, Inc., New York, 2004.
J. Clayden, N. Greeves, S. Warren, P. Wothers, Organic Chemistry, Oxford University Press, Oxford, 2001.
S. Borčić, O. Kronja, Praktikum preparativne organske kemije, Školska knjiga, Zagreb, 1991.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="6">Monitoring of quality assurance will be performed at three levels:
(1) University Level, conducting surveys of students on teaching quality;
(2) Faculty Level, by Quality Control Committee;
(3) Lecturer’s Level, monitoring and accepting suggestions of students and colleagues</td></tr>
</table>

Other (as the proposer wishes to add)	

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="6">Pharmacognosy</td></tr>
<tr><td>Code</td><td>KMF206</td><td>Year of study</td><td colspan="5">2.</td></tr>
<tr><td>Course teacher</td><td>PhD, Igor Jerković, Full Professor; PhD, Ani Radonić, Associate Professor</td><td>Credits (ECTS)</td><td colspan="5">7.0</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">PhD, Zdenka Kalođera, Full Professor</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>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="5"></td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">Acquisition of basic knowledge about drugs of plant origin and compounds from natural sources which are used as active ingredients in pharmaceutical industry, with emphasis on chemistry of pharmacologically active compounds , i.e. their structural characteristics, properties, biological distribution, biological activity and their application in pharmacy and medicine.</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 students will be able to:
- define drug and its natural source
- identify drug
- specify significance and application of important drugs
- specify main natural sources of pharmacologically active compounds which are used in pharmaceutical industry
- specify the most important representatives of pharmacologically active compounds belonging to various classes of natural products
- describe biosynthesis and chemical structure of pharmacologically active ingredients of drugs
- specify methods of qulitative and quantitative analysis of pharmacologically active compounds
- propose and perform laboratory procedures used to extract and separate pharmacologically active ingredients from their natural sources</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="6">Lectures:
1. Pharmacognosy and phytopharmacy – definition and objectives. Medicinal drugs of natural origin – definitions, nomenclature, drug forms, drugs constituents. Primary and secondary metabolites – significance in pharmacognosy. Classification of secondary metabolites. Secondary metabolites building blocks. (4 hours)
2. The acetate pathway. Fatty acids and aromatic polyketides. Lipids – properties and classification. Fats and fatty oils – chemical definition and classification. Triglyceride biosynthesis. Fatty acids - chemical definition and classification. Saturated, unsaturated, ω-3 and ω-6, essential fatty acids. (4 hours)
3. Localization of fats and fatty oils. Obtaining of fats and oils. Physico-chemical properties of fats and oils. Use of fats and fatty oils in pharmacy. Examples. Waxes – chemical definition. Plant waxes. Animal waxes. Compound lipids - chemical definition. Structure of compound lipids. Classification. Phosphatidylcholines. (3 hours)
4. Shikimate pathway. Fenolics. Basic structural types. Phenylpropanoids. Cinnamic</td></tr>
</table>

	acids. Phenylpropenes. Coumarins. Furocoumarins. Dicoumarins. Phenolic acids. Lignans and lignin. (4 hours) 5. Flavonoids. Biosynthesis. Classification and structural characteristics. Pharmacological action and applications. Examples of flavonoid containing drugs. Biflavonoids. Flavonolignans. Isoflavonoids. (4 hours) 6. Anthocyans. Examples of anthocyans containing drugs. Tannins. Condensed and hydrolyzable tannins. Examples of tannins containing drugs. Aromatic polyketides. Quinones – classification, pharmacological action and applications. Naphthoquinones. Examples of naphthoquinones containing drugs. Anthraquinones. Examples of anthraquinones containing drugs. (4 hours) 7. Terpenes. Isoprenic rule. Classification according to the number of isoprene units. Biosynthesis of 2- and 3-IPP starting from mevalonic acid and 1-deoxy-D-xylulose-5-phosphate. Biosynthetic terpenes building blocks (GPP, FPP and GGPP). Hemiterpenes. Monoterpenes (acyclic and cyclic (skeletons of p-menthane, bornane, pinane, thujane, carane), irregular monoterpenes). Sesquiterpenes. (acyclic and cyclic). (5 hours) 8. Typical essential oils and their main constituens. Diterpenes (phytol, taxol, abietic acid, ginkgolides). Sesterterpenes (sclarin, ophiobolin A and F). Triterpenes (squalene, lanosterol, cycloartenol). Tetraterpenes (carotenoids, retinol and dehydroretinol). Steroids. (cholesterol). (5 hours) 9. Alkaloids. Aminoalkaloids (ephedrine,mescaline, colchicine). Piperidine and pyridine alkaloids (coniine, nicotine). Tropane alkaloids (hyoscyamine, scopalamine and cocaine). Quinolizidine alkaloids (sparteine). Isoquinoline alkaloids (berberine, papaverine, morphine, codeine, narcotine, tubocurarine). Indole alkaloids (ergometrine, LSD, vinblastine, vincristine). Quinoline alkaloids (quinine, quinidine). Steroidal Alkaloids (rubijervine). Purine alkaloids (caffeine, theobromine and theophylline). (5 hours) 10. Forms and preparation of medicinal drugs. Phytopharmaceuticals (simple and designed). Extraction methods (maceration, digestion, percolation, repercolation, evacolation and diacolation; Soxhlet extraction, liquid-liquid extraction, ultrasonic extraction, microwave-assisted extraction, accelerated solvent extraction, supercritical and subcritical fluid extraction). Comparison of conventional and modern extraction methods. (3 hours) 11. Distillation methods (water distillation (hydrodistillation), water-steam distillation, steam distillation). Simultaneous distillation-extraction. Basics of isolate fractionation (polarity, acid-base properties). Chromatographic methods. Adsorption chromatography. Partition chromatography. Ion exchange chromatography. Affinity chromatography. Exclusion chromatography. Thin layer chromatography. Column chromatography. Gas chromatography. High performance liquid chromatography. (4 hours) ***12. Systematics of drugs – introduction. Mono- and disaccharides containing drugs. Polysaccharides containing drugs. Fruit (AHA) acids containing drugs. Fats and fatty oils containing drugs. Waxes. Essential oils containing drugs. Acyclic and cyclic monoterpenes containing drugs. (4 hours)*** ***13. Carvone containing drugs. Phelandrene containing drugs. Butylphthalide containing drugs. Phenolics containing drugs (thymol and carvacrol). 1,8-Cineole containing drugs. Thujone containing drugs. Bicyclic monoterpenes containing drugs. Balsams. Sesquiterpenes containing drugs. Phenylpropanoids containing drugs. (4 hours)***

	14. Phenolic glycosides containing drugs. Flavonoids containing drugs. Coumarins containing drugs. Iridoids containing drugs. Polysulfides containing drugs. Anthraquinone glycosides containing drugs. Cardiac glycosides containing drugs. (4 hours) 15. Saponins containing drugs. Tannins containing drugs. Alkaloids containing drugs. (3 hours) **Seminars (15 hours divided into 4 days):** Systematics of drugs – identifying of selected drugs of plant origin. **Exercises (6 lab periods):** 1. Essential oils. Isolation of lavender essential oil by hydrodistillation using apparatus according to the European Pharmacopoeia (Ph. Ur). 2. Essential oils. Isolation of clove essential oil by water and steam distillation. 3. Isolation of phenylpropane derivative eugenol from clove essential oil. Thin layer chromatography (TLC) of lavender and clove essential oils. Density determination of lavender and clove essential oils. 4. Recording and interpretation of UV/VIS and FT-IR spectra of eugenol and clove essential oil. Evaluation of eugenol and clove essential oil antioxidant activity by DPPH method. 5. Alkaloids. Isolation of caffeine from tea. 6. Characterization of caffeine. Colour reaction. Thin-layer chromatography. Determination of melting point. UV/VIS and FT-IR spectroscopy.
Format of instruction	x lectures x seminars and workshops x exercises ☐*on line*in entirety ☐partial e-learning ☐field work ☐independent assignments x multimedia x laboratory ☐work with mentor ☐ (other)
Studentresponsibilities	Students are required to attend lectures and seminars in the amount of at least 80% of the times scheduled and complete all laboratory exercises (100% attendance). Active participation in teaching process will be also evaluated in the final score.

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	1.0	Report		(Other)	
	Essay		Seminar essay		(Other)	
	Tests	1.0	Oral exam		(Other)	
	Written exam	4.0	Project		(Other)	

Grading and evaluating student work in class and at the final exam	A student can pass the entire exam by taking and passing three partial exams (tests) during the semester. Test passing score is 60%. Each test constitute 30% of the final exam score. Grades achieved through laboratory exercises will constitute 10% of the final score. Any of the partial exams passed during the semester is valid throughout the academic year. Students who do not pass some of the partial exams or all of them have to take an written exam in the regular examination periods. Exam passing score is 60%. Grades depending on the test score: 60% - 69% - satisfactory, 70% -79% - good, 80% -89% very good, 90% -100% - excellent.

Required literature (available in the	**Title**	**Number of**	**Availability via**

		copies in the library	other media
library and via other media)	D. Kuštrak, Farmakognozija-Fitofarmacija, Golden marketing-Tehnička knjiga, Zagreb, 2005.	1	
	P. M. Dewick, Medicinal Natural Products, John Wiley & Sons, Inc., New York, 1997.	1	
Optional literature (at the time of submission of study programme proposal)	J. Bruneton, Pharmacognosy, Phytochemistry, Medicinal Plants, Lavoisier publishing Inc., Paris, 1995. S. V. Bhat, B. A. Nagasampagi, M. Sivakumar, Chemistry of Natural Products, Springer-Narosa, Berlin, 2005. J. Mann, R. S. Davidson, J. B. Hobbs, D. V. Banthorpe, J. B. Harborne, Natural products: their chemistry and biological significance, Addison Wesley Longman Limited, Harlow, 1994.		
Quality assurance methods that ensure the acquisition of exit competences	Monitoring of quality assurance will be performed at three levels: (1) University Level, conducting surveys of students on teaching quality; (2) Faculty Level, by Quality Control Committee; (3) Lecturer's Level, monitoring and accepting suggestions of students and colleagues		
Other (as the proposer wishes to add)			

NAME OF THE COURSE	Pathophysiology					
Code	KMF207	Year of study	2.			
Course teacher	Prof. dr. Tina Tičinović Kurir	Credits (ECTS)	5.0			
Associate teachers	Prof. dr. sc. Dragan Ljutić, Joško Božić, dr. med., doc. dr. sc. Anteo Bradarić, dr. sc. Andre Bratanić	Type of instruction (number of hours)	L	S	E	T
			30	15	15	0
Status of the course	Mandatory	Percentage of application of e-learning	0%			

COURSE DESCRIPTION

Course enrolment requirements and entry competences required for the course	Successful completion of the 1st year of the Program.
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	- Determine and interpret pathophysiological disorders characteristic for the individual functional units, as well as for the whole organism - Explain and critically interpret functional tests in the evaluation of various pathological conditions - Explain and discuss the changes that occur in disorders of control mechanisms (both positive and negative feedback) of individual organ systems, as well as the entire organism - Enumerate, describe and explain the clinical features associated with specific pathophysiological processes in various pathological conditions - Explain the impact of inheritance, environmental factors and risk factors in the etiopathogenesis of various pathological conditions
Course content broken down in detail by weekly class schedule (syllabus)	General pathopysiology: disease, illness, symptoms, signs, problems of the metabolism and the detoxication; fizical, chemical and biological etiology of the dissese, Inflamation, cancer, genetic disease and etc. Specialy pathophysiology of the major organ systems: heart, vascular system, haematostasis and haematopoietic system, respiratory system, nervous system, kidney, gastrointestinal tract, endocrine glands, and basic differential diagnosis. Beside lectures and seminars, there are few laboratory exercises with experimental animals and measurement of pressure, EKG and patients presentation.
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)
Student responsibilities	In accordance to Rules of studying and Deontological code for USSM students.

Screening student work *(name the proportion of ECTS credits for each activity so that the total number of*						
	Class attendance	1	Research		Practical training	
	Experimental work		Report		(Other)	
	Essay		Seminar essay	1	(Other)	

ECTS credits is equal to the ECTS value of the course)	Tests		Oral exam		(Other)	
	Written exam	3	Project		(Other)	
Grading and evaluating student work in class and at the final exam	Task-based written examination; MCQ test.					

	Title	Number of copies in the library	Availability via other media
Required literature (available in the library and via other media)	S. Gamulin, M. Marušić, Z. Kovač, Patofiziologija, 7. izdanje, Medicinska naklada, Zagreb, 2011.	15	

Optional literature (at the time of submission of study programme proposal)	Z. Kovač, Problemski zadaci iz patofiziologije, 3.izdanje, Medicinska naklada, Zagreb, 2011.
Quality assurance methods that ensure the acquisition of exit competences	▪ Teaching quality analysis by students and teachers ▪ Exam passing rate analysis ▪ Committee for control of teaching reports ▪ External evaluation
Other (as the proposer wishes to add)	

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="6">Pathology</td></tr>
<tr><td>Code</td><td>KMF208</td><td>Year of study</td><td colspan="5">2</td></tr>
<tr><td>Course teacher</td><td>Prof.dr.sc. Valdi Pešutić-Pisac</td><td>Credits (ECTS)</td><td colspan="5">4</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Prof. dr. Snježana Tomić
Prof. dr. Meri Glavina Durdov
Prof. dr. Ivana Kuzmić Prusac
Doc. dr. Gea Forempoher
Mr. sc. Joško Bezić
Dr. sc. Ivana Mrklić
Dr. sc. Sandra Zekić Tomaš
Dr. sc. Dinka Šundov
Mr. sc. Nenad Kunac</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>T</td></tr>
<tr><td>20</td><td>20</td><td></td><td></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 enrolment requirements and entry competences required for the course</td><td colspan="7">Successful completion of the 1st year of the Program.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="7">Identify, describe and explain the most important characteristics of the basic reaction of cells and tissue and organs.
Describe, discriminate and explain control mechanisms that underlie debvelopment of all diseases and explain the functional consequence of the morphological changes.
Name and explain illnesses that occur in each system and compare them with similarities and differences in physiological functioning in our body.
Use acquired theoretical knowledge for solving practical problems from clinical cases and be able to participate in argumentative discussions with construct opinions.</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="7">General pathology: Cellular adaptations, injury and death, tissue regeneration, reparation and healing, genetic disordera, diseases of immunity, neoplasia and environmental pathology.

Pathology of organs and organ systems: oral and dental pathology, head and neck pathology, cardiovascular pathology. Lung pathology, gastrointestinal pathology, endocrine pathology, pathology of bones, peripheral nerves, skeletal muscles and central nervous system.</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="4">☐ independent assignments
☐ multimedia
☐ laboratory
☐ work with mentor
☐ (other)</td></tr>
<tr><td>Student responsibilities</td><td colspan="7">In accordance to Rules of studying and Deontological code for USSM students.</td></tr>
</table>

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

Grading and evaluating student work in class and at the final exam	Writen examination

	Title	Number of copies in the library	Availability via other media
Required literature (available in the library and via other media)	1. Damjanov I, Seiwerth S, Jukić S, Nola M. Patologija. IV izdanje. Zagreb: Medicinska naklada; 2014.		
	2. CD-rom. Patologija. Medicinski fakultet Zagreb-Kanzas School of medicine.		

Optional literature (at the time of submission of study programme proposal)	• Nola M, Damjanov I. i sur. Patologija. Priručnik za pripremu ispita. Zagreb: Medicinska naklada; 2008. • Mladen Belitza: Obdukcijska dijagnostika, II dopunjeno izdanje, Medicinski fakultet
Quality assurance methods that ensure the acquisition of exit competences	▪ Teaching quality analysis by students and teachers ▪ Exam passing rate analysis ▪ Committee for control of teaching reports ▪ External evaluation
Other (as the proposer wishes to add)	

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="6">General Biochemistry</td></tr>
<tr><td>Code</td><td>KMF209</td><td>Year of study</td><td colspan="5">2nd</td></tr>
<tr><td>Course teacher</td><td>PhD Olivera Politeo, Associate Professor</td><td>Credits (ECTS)</td><td colspan="5">4</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">PhD Franko Burčul
Ivana Carev</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>-</td><td>15</td><td>-</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">Acquisition a basic knowledge and skills in the field of biochemistry.</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">• Understand the basic principles of protein structure and the impact of their structure on biological function.
• Understand the basic principles of enzyme kinetics and enzyme inhibition.
• Understand the importance of carbohydrate structures in the living system.
• Understand the importance of lipid structures in living system.
• Explain the structure and role of biological membranes.
• Understand the structure and biological function of nucleic acids.</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="6">LECTURES:
The history of biochemistry. The origin of life. (2) Water, bioelements, biomolecules and chemical bonds in living organisms. (2). Amino acids (1). Buffers & Buffer systems. (1). Proteins. Protein conformation. (2) Protein sequencing. (1) Protein function. Collagen & Elastin. (1) Hemoglobin & Myoglobin. (2) Isolation and characterisation of proteins. (1) Enzymes. Enzyme kinetics. Enzyme inhibition. (2) Regulation of enzyme activity. (1) Coenzymes and Cofactors. (2) Carbohydrates. Glycoproteins. (2) Lipids. Lipoproteins. Steroids. (3). Biological membranes. Transport across membranes. (2) Nucleotides and nucleic acids. DNA replication. Transcription. Translation (3) Posttranslacijske modifikacije i transport proteina. (2)

EXERCISES:
The potentiometric titration of amino acids. (3) Quantitative determination of proteins by Bradford method. (3) The enzyme kinetics: determination vmax and Km. (3) The properties of carbohydrates and qualitative tests for carbohydrates. (3) Analysis of lipids in eggs. (3)</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☐lectures
☐exercises</td><td colspan="3"></td></tr>
<tr><td>Student</td><td colspan="6">Class attendance, attending to experimental work and taking the final exam</td></tr>
</table>

<table>
<tr><td>responsibilities</td><td colspan="6"></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>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></td><td>(Other)</td><td></td></tr>
<tr><td>Tests</td><td>0,5</td><td>Oral exam</td><td>1</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 colspan="6"></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="6">Activity during attendance, experimental work and final exam.</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">J.M. Berg, J.L. Tymoczko, L. Stryer: Biokemija, 5th Ed, Školska knjiga Zagreb, 2013.</td><td></td><td colspan="2"></td></tr>
<tr><td colspan="3">R.M.Murray i sur: Harperova ilustrurana biokemija, 28th Ed, Medicinska naklada, Zagreb 2011.</td><td></td><td colspan="2"></td></tr>
<tr><td colspan="3"></td><td></td><td colspan="2"></td></tr>
<tr><td colspan="3">S K Sawhney, R ingh: Introductory Practical Biochemistry. Alpha Science International Ltd., Harr 2008.</td><td></td><td colspan="2"></td></tr>
<tr><td colspan="3">Olivera Politeo: Biokemijski praktikum, interni materijal.</td><td></td><td colspan="2"></td></tr>
<tr><td colspan="3"></td><td></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">L. Stryer: Biokemija, II ed., Školska knjiga Zagreb,1991.
Karlson: Biokemija, Školska knjiga Zagreb,1993.
L. Stryer: Biochemistry, Freeman, NY, 1995.
D. Voet, J.G.Voet, C.W.Pratt: Fundamental of Biochemistry, Jonn Wiley & Sons Inc., NY, Chichester, Weinheim, Brisbane, Singapore, Toronto,1999</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="6">Monitoring of quality assurance will be performed at three levels: (1) University, (2) Faculty Level by Quality Control Committee, (3) Level of teachers.</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="6"></td></tr>
</table>

NAME OF THE COURSE	Electroanalytics in pharmacy					
Code	KMF17	Year of study	2nd			
Course teacher	Senka Gudić	Credits (ECTS)	3.0			
Associate teachers		Type of instruction (number of hours)	L	S	E	F
			30			
Status of the course	Elective	Percentage of application of e-learning				

COURSE DESCRIPTION

Course objectives	Acquiring basics knowledge about detection and analysis of drugs by means of electrochemical measurements methods.
Course enrolment requirements and entry competences required for the course	
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	After the successfully passed exam student is able to: - explain the mechanism and kinetics of electrode processes - describe electrochemical detectors and their performance - recognize the electroaction of functional groups and compounds - clarify the electrochemical mechanisms of disease and drugs action - applied the electrochemical methods in the detection and analysis of drugs.
Course content broken down in detail by weekly class schedule (syllabus)	- Fundamental principles of electrochemical methods. Electrochemical detectors and their construction. Micro-detectors. Potential sweep methods. (6 hours) - Pulse methods. Impedance methods. Electrochemical quartz crystal microbalance (EQCM). (6 hours) - High-performance liquid chromatography with electrochemical detection (HPLC-ED). First test. Electroactivity of functional groups and compounds. (6 hours) - Electrochemical mechanisms of disease and drug activity: Thrombosis and heart disease. Electrochemical approaches to cancer; Electrochemical healing of fractures; Electrochemical mechanism of the nervous system. (6 hours) - Examples of application of electrochemical methods in detection and analysis of drugs: cardiovascular drugs, anticancer drugs, antibiotics, analgesics, anaesthetics, antidepressants, diuretics. Second test. (6 hours)
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)
Student responsibilities	

Screening student work*(name the proportion of ECTS credits for eachactivity so that the total number of ECTS credits is*						
	Class attendance	0.4	Research		Practical training	
	Experimental work		Report		(Other)	
	Essay		Seminar essay		(Other)	
	Tests	0.8	Oral exam	1.0	(Other)	

equal to the ECTS value of the course)	Written exam	0.8	Project		(Other)	
Grading and evaluating student work in class and at the final exam	The complete exam can be passed through two tests during semester. The passing score is 60 % and the fraction of each test is 50 %. In the exam period the student has to attend to written and oral exam. Grades: < 60% insufficient, 60-70% sufficient, 71-80% good, 81-92% very good, 93-100% excellent.					
Required literature (available in the library and via other media)	**Title**			**Number of copies in the library**	**Availability via other media**	
	O'M. Bockris, A.K.N. Reddy, Modern Electrochemistry 2B, Kluwer Academic Publishers, New York, 2000.			1		
	R.J. Flanagen, D. Perrett, R. Whelpton, Electrochemical detection in HPLC: Analysis of Drugs and Poisons, The Royal Society of Chemistry, Cambridge, 2005.					
Optional literature	S. Alegret, A. Merkoci (Eds.), Electrochemical Sensors Analysis, Elsevier, Oxford, 2007.					
Quality assurance methods that ensure the acquisition of exit competences	- monitoring of students suggestions and reactions during semester - students evaluation organized by University					
Other (as the proposer wishes to add)						

Course title	Basics of bioinorganic chemistry		
Course code	KMFI8		
Type of course	Lectures, seminars, exercises (30+0+0)		
Level of course	Basic level course		
Year of study	2nd year	**Semester**	III. or IV.
ECTS (Number of credits allocated)	3.0		
Name of lecturer	Dr. Slobodan Brinić, assistant professor, Dr. Zoran Grubač, associate professor		
Learning outcomes and competences	The aim of this course is to understand the basic concepts of bioinorganic chemistry by the correlation of function, structure and actual reactivity of inorganic elements in organisms. The students have to learn to write seminar works using different sources as internet, articles and books.		
Prerequisites	General chemistry with stoichiometry		
Course contents	From inorganic point of view the basic properties of elements important for biology and biochemistry will be given to students. Distribution and biological accessibility of inorganic elements, speciation of chemical elements, coordination properties of metals, their complexation and stability constants will be elaborated. Biochemistry of hydrogen, role of sodium, potassium and chlorine in biological systems, biochemistry of magnesium and metabolism of phosphates, the importance of calcium, copper, nickel, phosphorous, silicone an other nonmetals in biological and biochemistry processes, toxicity of metals and nonmetals will be elaborated.		
Recommended reading	W. Kaim, B. Schwederski, Bioinorganic Chemistry: Inorganic Elements in the Chemistry of Life, J. Wiley & Sons, Chichester, 1994.; J. J. R. Frausto da Silva, R. J. P. Williams, The biological chemistry of the elements: the inorganic chemistry of life, Oxford University Press, Oxford, 2001.; I. Filipović, S. Lipanović, Opća i anorganska kemija 1. and 2. part, Školska knjiga, Zagreb, 1995		
Supplementary reading	I. Bertini, H. B. Gray, S. J. Lippard, J. S. Valentine: Bioinorganic chemistry, University Sciense Books, Sausalito, CA, 1994.		
Teaching methods	Lectures.		
Assessment methods	Written examination		

Language of instruction	Croatian
Quality assurance methods	Quality assurance will be performed at three levels: (1) University Level, (2) Faculty Level by Quality Control Committee, (3) Lecturer's Level

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">Containers in Pharmacy</td></tr>
<tr><td>Code</td><td>KMF19</td><td>Year of study</td><td colspan="4">2</td></tr>
<tr><td>Course teacher</td><td>Nataša Stipanelov Vrandečić</td><td>Credits (ECTS)</td><td colspan="4">3.0</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></td><td></td><td></td></tr>
<tr><td>Status of the course</td><td>Optional</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">Aim of the course is to represent the materials for containers and containers described by European and Croatian Pharmacopoeia, as well as their application for production of items for medical and surgical usage. Students will get acquainted with containers for pharmaceutical product.</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 the successfully passed exam student should be able to:
- define the main functions of pharmaceutical products packaging
- identify the characteristics of different kind of pharmaceutical products and its sensitivity on external influences
- describe and identify various materials for pharmaceutical products packaging
- identify the interactions in pharmaceutical product - packaging system
- design packaging solution</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="5">1st week: Introduction. Functions of the pharmaceutical product containers.
2nd week: Protective functions: physical protection, protection from the light, barrier protection from vapors and gases, protection from the volatile ingredients loss, protection from contamination.
3rd week: Application functions and contemporary labeling methods.
4th week: Types and characteristics of the pharmaceutical product containers.
5th week: Pharmacopoeial testing: characteristics, identification, contamination testing, content. Glass, glass containers for pharmaceutical application (bottles and ampoules).
6th week: Metallic materials (aluminium, steel, tin), protective coatings for metallic containers, aluminium foils, tubes, metal caps. Interaction of the metallic containers with the pharmaceutical preparations.
7th week: Polymeric materials for the pharmaceutical product containers, additives for the polymeric materials.
8th week: The characteristics and the pharmaceutical convenience of the polymeric materials. Materials on the bases of poly(vinyl chloride), plasticized and unplasticized poly(vinyl chloride).
Written test (first)
9th week: Containers for human blood and blood component: materials based on plasticized poly(vinyl chloride) for sterile containers for human blood and blood component, sterile containers for human blood with solution against coagulation, water solution containers for intravenous infusion
10th week: Set for transfusion of human blood and blood components. Materials based on unplasticized poly(vinyl chloride) for non-injection water solution containers and containers for dry forms for oral application.
11th week: Polyolefines: polyethylene for parenteral and ophthamological</td></tr>
</table>

<table>
<tr><td></td><td colspan="6">preparation containers; polypropylene for containers and cups for parenteral and ophthamological preparation.
12th week: Poly(ethylene/vinyl acetate) for containers and tubes for complete parenteral nourishment. Application of silicon oil as lubricant. Silicon elastomers for caps and tubes.
13th week: Polyesters: polycarbonate, poly(ethylene therephtalate) for containers which are not for parenteral application. Plastic containers and cups for pharmaceutical application. Plastic for water solutions containers for parenteral infusion.
14th week: Sterile plastic disposable syringe. Rubber cups for water parenteral preparations, powders and liophylised powders. Multy-layered materials for pharmaceutical product containers.
15th week: Contemporary pharmaceutical products packaging: blister packaging, strip packaging, etc.
Written test (second)</td></tr>
<tr><td>Format of instruction</td><td colspan="3">xlectures
☐seminars and workshops
☐exercises
☐on linein entirety
☐partial e-learning
☐field work</td><td colspan="3">☐independent assignments
xmultimedia
☐laboratory
☐work with mentor
☐ (other)</td></tr>
<tr><td>Studentresponsibilities</td><td colspan="6">Lecture attendance min. 70 %</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>1.00</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></td><td>Oral exam</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td>2,00</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 complete exam can be passed through two partial tests during semester.
Attendance on lectures, A_1(successfulness =70 -100 %), share in grade, k_1 =0,10
1st test, A_2 (successfulness =60 -100 %), share in grade, k_3 =0,45
2nd test, A_3 (successfulness =60 -100 %), share in grade, k_4 =0,45

GRADE (%) = $0,10A_1$+4 $0,45A_2$+ $0,45A_3$

FINAL GRADE: successful (60% – 70 %), good (71% – 80 %), very good (81% – 90 %), excellent (91% – 100 %).

In the case that student passed only one test during continuous evaluation, he/she have to attend to exam in the regular exam periods.</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">Hrvatska farmakopeja 2007 s komentarima, HFD, Zagreb, 2007.</td><td>1</td><td colspan="2"></td></tr>
<tr><td colspan="3">European Pharmacopoeia, Fifth edition, Vol. 1, EDQM, Strasbourg, 2005.</td><td></td><td colspan="2"></td></tr>
</table>

Optional literature (at the time of submission of study programme proposal)	F.A. Paine, H. Lockhart, *Packaging Pharmaceutical and Healthcare Products*, Blackie Academic & Professional, Glasgow, 1996.		
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)			

NAME OF THE COURSE	Selected Topics of Pharmaceutics					
Code	KMFI10	Year of study	2.			
Course teacher	PhD, Vesna Sokol, Assistant Professor	Credits (ECTS)	3.0			
Associate teachers		Type of instruction (number of hours)	L	S	E	F
			30			
Status of the course	Elective	Percentage of application of e-learning				

COURSE DESCRIPTION

Course objectives	Students will acquire the knowledge of the physical and chemical properties of solids and liquids in the pharmaceutical formulations.
Course enrolment requirements and entry competences required for the course	
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	After successful completion of the course students will be familiar with: 1) the physical and chemical properties of powders, solutions and disperse systems in the pharmaceutical formulations, 2) the parameters that affect the chemical stability of the solution and solid, 3) the influence of moisture on the stability of the formulation, 4) rheological problems in pharmaceuticals, 5) principles of extended and controlled release
Course content broken down in detail by weekly class schedule (syllabus)	1. The properties of solids, density, porosity, mixing, rheology, fluidization, humidity and drying, lyophilization, chemical instability in solids (6 hours) 2. Dispersion stability, separation of dispersions, rheological systems, rheological problems in pharmaceuticals (6 hours) 3. Processes in solution, diffusion, extraction, adsorption from solution and gas, dissolution of solids, Noyes-Whitney equation, Hixson-Crowell equation, chemical instability in solutions (6 hours) 4. Polymers in pharmacy, structure and properties of polymers, biodegradable polymers, principles of extended release, reservoir systems, matrix systems (6 hours) 5. Principles of controlled release/effect, examples of therapeutic systems, microparticles, microcapsules, microspheres, liposomes, osmotic pumps, various oral forms, ocular systems, transdermal systems (6 hours)
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 ☐ (other)
Studentresponsibilities	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*						
	Class attendance	1.5	Research		Practical training	
	Experimental work		Report		(Other)	

eachactivity so that the total number of ECTS credits is equal to the ECTS value of the course)	Essay		Seminar essay		(Other)	
	Tests		Oral exam		(Other)	
	Written exam	1.5	Project		(Other)	
Grading and evaluating student work in class and at the final exam	The final grade is based on the evaluation of the final written exam. Grades: <60% not satisfied; 60-69% successful (2); 70-79% good (3), 80-89% very good (4), 90-100% excellent (5).					

	Title	**Number of copies in the library**	**Availability via other media**
Required literature (available in the library and via other media)	I. Jalšenjak, V. Jalšenjak, J. Filipović-Grčić, Farmaceutika, Školska knjiga, Zagreb, 1998.	2	
	K. S. Birdi, Surface and Colloid Chemistry, Principles and Applications, CRC Press, Boca Raton, London; New York, 2010.	1	
Optional literature (at the time of submission of study programme proposal)	P. Atkins, J. de Paula, Atkins' Physical Chemistry, 8th Edition, Oxford University Press, Oxford 2006.		
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)			

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">Dietetics</td></tr>
<tr><td>Code</td><td>KMFI 11</td><td>Year of study</td><td colspan="4">2</td></tr>
<tr><td>Course teacher</td><td>Ph.D. Tea Bilusic, full professor</td><td>Credits (ECTS)</td><td colspan="4">3.0</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></td><td></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">35%</td></tr>
<tr><td colspan="6">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="5">- Knowledge in the role of macro- and micronutrients from food
- Understanding the calucation of daily energy requirements for targeted populations
- Knowledge in principle of healthy diet
- Acquiring competition in creation of healthy diet regime
- Acquirinig competition in determination of nutritive status
- Acquiring competition in calucation of daily calory intake
- Acquiring competition in creation of healty diet regime for following diseases: diabetes type 2, coronary heart diseases, obesity…)
- Knowledge on the mechanisms of interaction between food and
- Knowledge on the most common food allergens</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">- Acquiring knowledge in main characteristics of healty diet
- Understanding the mechanisms of nutrients in human body homeostasis
- Acquiring knowledge in factors affecting nutritive status
- Understanding the role of the diet in various chronic diseases
- Understanding the effect of diet on the incidence for chronic diseases development (the epigenetic role)
- Understanding the beneficial role of healthy diet regime in prevention of malignant diseases
- Understanding the mechanisms of food-drug interactions
- Acquiring the knowledge on the most common food allergens</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="5">1. Macronutrients in food and their role 4 hours
2. Micronutrients in food and their role 2 hours
3. Determination of the energy requierements of the body 2 hours
4. Determination of the nutritive status of the body 2 hours
5. Principles of healthy diet regime 2 hours
6. The role of epigenetics in the diet 2 hours
7. Functional food components 2 hours
8. Diet and aging process 2 hours
9. Eating disorders 1 hour
10. Diet regime in specific disease: obesity, coronary heart diseases, diabetes type 2, anemia, diseases of digestive system 4 hours
11. The role of the diet in the prevention of malignant diseases 1 hour
12. Food allergens 2 hours</td></tr>
</table>

<table>
<tr><td></td><td colspan="6">13. Food-drug interactions 2 hours
14. Weight-reduction diets 2 hours</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
☒ interactive animations</td></tr>
<tr><td>Student responsibilities</td><td colspan="6">Lectures attendance - at least 70% of full schedule.</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</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>Activity during course</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>1.5</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>Grading and evaluating student work in class and at the final exam</td><td colspan="6">Written test will be carried out within 60 minutes at the end of course. For positive mark it is necessary to achieve minimally 60% score with the test.</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">T. Bilušić: Dijetetika, revised power point presentation, 2013, KTF</td><td></td><td colspan="2">KTF web page</td></tr>
<tr><td colspan="3">T. Bilušić: Osnove znanosti o hrani, revised power point presentation, 2013, KTF</td><td></td><td colspan="2">KTF web page</td></tr>
<tr><td colspan="3">V. Katalinić: Temeljno znanje o prehrani, manual, 2011, KTF</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>X</td><td colspan="2"></td></tr>
<tr><td>2.</td><td colspan="3">R. Živković: Dijetetika, Medicinska naklada, Zagreb, 2002.</td><td></td><td colspan="2">Professor has one example</td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="6">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>

Course title	Pharmaceutical measurements		
Course code	KMFI12		
Type of course	Lectures, seminars, exercises (30+0+0)		
Level of course	Basic level course		
Year of study	2nd year	**Semester**	III. or IV.
ECTS (Number of credits allocated)	3.0		
Name of lecturer	Dr. Marija Bralić, assistant professor		
Learning outcomes and competences	*Aim of course* Aim of the course is to introduce the students with characteristic and special ways of measuring, in pharmacy, with the process of measuring, forming measuring systems, measuring procedures and means for insuring measuring units, procedures for achieving validity, scientific identification of standard substances and another standards, principles of ensuring quality, with requests for qualified research and modest laboratories. *List of skills and competences* Aim of the course is to educate the students for realize right implementation of meassuring procedure, and correct interpretation of the results of measuring, thanks to theories principles process meassuring and applicability reagents and comparative substances, and recognition of acceptable method and credibility, understanding ways of measuring instruments, acquire skill validity choice method of calibration, as knowing principles securing quality of work in meassuring laboratory.		
Prerequisites	-		
Course contents	Measuring as relationship of largeness. Forms of measurement size: target size, the size of measurable and parameters of analytical procedure. Reagent, specifications, reagents stability, storage and labeling. Chemical, biological and physical comparative substances. Metering unity and legal units of measurement. Measurement techniques, measuring devices and their calibration. Implementation of measurements. Procedures "thickening" of measurement values. Valid analytical information. Structure of measurement that is approaching a proper measurement. Production and processing of analytical rules. Standard Operating Procedure - SOP. Reasons for the use of standards. QA / QC work.		

	Probability results, the random and systematic errors. Statistical techniques. Chemical analysis of the system. Principles of quality control. Samples and sampling. Selection methods for calibration, calibration and analytical functions. Principles of quality assurance. Blind experiment, and control charts. Determining the acceptability of methods and selection the most advantageous analytical procedure, the standard and complete analytical procedure. Testing laboratory expertise.
Recommended reading	V. Grdinić, Rječnik mjeriteljstva u kontroli kakvoće lijekova, HFD, Zagreb, 1994. [poseban dodatak u Farmaceutski glasnik]; J. K. Taylor, Quality Assurance of Chemical Measurements, Lewis Publishers, Chelsea, 1987; V. Grdinić, L. Stefanini Orešić, Znanstvena i praktična analiza. I-VIII., Farmaceutski glasnik, 34:2-3 (1978) 33-130 i druge iz iste skupine članaka.
Supplementary reading	M. Kaštelan-Macan, Kemijska analiza u sustavu kvalitete, Školska knjiga, Zagreb, 2003.; K. Eckschlager, V. Štěpánek, Analytical Measurement and Informatiuon. Advances in the information theoretic approach to chemical analyses, Research Studies Press, Letchworth, 1986.; K. Eckschlager, Errors, measurement and results in chemical analysis, Van Nostrand Reinhold, London, 1969.; V. Grdinić, Instrumentalne metode analitičke kemije, u: Tehnička enciklopedija, VI. Sv., JLZ, Zagreb, 1979.
Teaching methods	Lectures, exercises.
Assessment methods	Written or oral examination,
Language of instruction	Croatian
Quality assurance methods	Quality assurance will be performed at three levels: (1) University Level, (2) Faculty Level by Quality Control Committee, (3) Lecturer's Level

NAME OF THE COURSE	Applied Biochemistry					
Code	KMF301	Year of study	3.			
Course teacher	Doc. dr. sc. Vedrana Čikeš Čulić	Credits (ECTS)	6.5			
Associate teachers	Prof. dr. sc. Maja Pavela-Vrančič Doc. dr. sc. Mila Radan Nikolina Režić Mužinić, prof. biol. chem. Angela Mastelić, mag. ing. mol. biotech.	Type of instruction (number of hours)	L	S	E	T
			30	15	30	0
Status of the course	Mandatory	Percentage of application of e-learning	0%			

COURSE DESCRIPTION						
Course enrolment requirements and entry competences required for the course	Passed exams from the 2nd year of the Program.					
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	1. Describe and explain the structure and reactions of the most important biochemical compounds, including small, large and supramolecular structures that are found in the cell 2. Define and explain the principles of biochemical and energetic changes as well as regulation mechanisms of metabolism of carbohydrates, lipids, proteins, informational macromolecules and signaling molecules 3. Integrate the metabolic changes at the cell, tissue, and whole organism level 4. Develop practical skills for working in the laboratory (the basics of safe practice in the lab, the calculation of basic laboratory parameters and monitoring and interpretation of results of laboratory measurements 5. Critically judge the meaning of biochemistry in modern medical science					
Course content broken down in detail by weekly class schedule (syllabus)	Structures and functions of proteins and enzymes. Bioenergetics and the metabolism of carbohydrate and lipids. Metabolism of proteins and amino acids. Structure, function and replication of informational macromolecules. Biochemistry of extracellular and intracellular communication. Special topics (Nutrition, Micronutrients, Free radicals and Antioxidant Nutrients, Hemostasis and Thrombosis, Red and white Blood Cells, Metabolism of Xenobiotics and Biochemical case Histories).					
Format of instruction	☒ lectures ☒ seminars and workshops ☒ exercises ☐ *on line* in entirety ☐ partial e-learning ☐ field work		☐ independent assignments ☐ multimedia ☒ laboratory ☐ work with mentor ☒ consultations			
Student responsibilities	In accordance to Rules of studying and Deontological code for USSM students.					
Screening student work *(name the proportion of ECTS credits for each*	Class attendance	2	Research		Practical training	
	Experimental		Report		Laboratory test	0,5

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

Grading and evaluating student work in class and at the final exam	Oral and written exam.		
Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	R. K. Murray, D.A. Bender, K.M. Botham, P.J. Kennelly, V. W. Rodwell, P. A. Weil: Harperova ilustrirana biokemija, 28. izdanje Lange Medical Books / McGraw-Hill, 2009. (Hrvatski prijevod, 2011.)	15	
Optional literature (at the time of submission of study programme proposal)	Marks AD, Lieberman M, Smith C. Mark's Basic Medical Biochemistry a Clinical Approach Sec. Ed., Lippincott Williams & Wilkins, 2005.		
Quality assurance methods that ensure the acquisition of exit competences	▪ Teaching quality analysis by students and teachers ▪ Exam passing rate analysis ▪ Committee for control of teaching reports ▪ External evaluation		
Other (as the proposer wishes to add)			

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">Pharmaceutical Chemistry I</td></tr>
<tr><td>Code</td><td>KMF302</td><td>Year of study</td><td colspan="4">3</td></tr>
<tr><td>Course teacher</td><td>Prof. dr. sc. Marica Medić-Šarić</td><td>Credits (ECTS)</td><td colspan="4">9,0</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Maja Marasović, mag. chem.</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>T</td></tr>
<tr><td>45</td><td>15</td><td>60</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">0%</td></tr>
<tr><td colspan="6">COURSE DESCRIPTION</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="5">Passed exams from the 2nd year of the Program.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="5">1. To acquire knowledge about chemical formulas of drugs and their pathways of synthesis

2. To recognize the structure properties related to drug’s activity

3. To discuss the effect of a drug, related to its structural properties

4. To identify all steps in pathways of synthesis of drugs

5. To recognize the chemical groups responsible for the therapeutic effect of a drug

6. To describe and explain the role of pro-drugs

7. To assess the toxicological potential of a drug</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="5">Lectures:

Drugs influencing on gastrointestinal tract (Acids, Antiacids, H_2-Antihistamines, Adsorbents, Laxatives), Alcaloses, Acidosis. Antidotes. Calcium and Calcium Salts. Iron and Iron Salts. Antipruritics. Plasma Expanders (Dextran, Hydroxyethyl starch, Gelatin). Diagnostics. Antiseptics, Alcohols. Drugs for the treatment of urinary infection (Nitrofuran Derivatives, Nalidixic Acid). Quinolones and Analogs (Gyrase Inhibitors). Cytostatics (Alcylating Agents, Antimetabolites, Cyclophosphamide, Azathioprine, Cytostatically Active Antibiotics, Hormons and Hormone Antagonists, Miscellaneous Cytostatics, Radioactive Izotopes). Antiviral Drugs (Amantadine, Tromantadine, Antimetabolites, Interferone). Sulfonamides, Sulfones. Antibiotics: β-Lactam Antibiotics (Penicillins, Cefalosporins, Monobactams, Carbapenems), Chloramphenicol, Tetracyclines, Aminoglycosides (Streptomycin group, Neomycin group, Kanamycin-Gentamycin group, Spectinomycin), Lincosamides (Lincomycin, Clindamycin), Macrolides (Erytromycin group, Azytromycin), Polypeptide Antibiotics (Bacitracin, Polymyxin B, Colistin-Polymyxin E, Tyrothricin), Glycopeptides (Vancomycin, Teicoplanin). Tuberculostatics (Primary Drug: Isoniazid, Rifampicin, Ethambutol; Second Drug: Protionamid, p-Aminosalicylic</td></tr>
</table>

<table>
<tr><td></td><td colspan="6">Acid-PAS, Cycloserine, Capreomycin). Antifungal Drugs. Antiprotozoics (Cestodes, Nematodes, Trematodes). Antihelmintics. Antimalarial Drugs (Quinine, Quinidine and Derivatives, Proguanil, Pyrimethamine).

Seminars:

Theoretical preparation for laboratory work; detail overview of specific drug substances from the Medicinal Chemistry (physico-chemical properties, structure, stereochemistry, synthesis, pharmacological effect and adverse effects, doses, application route, drugs on market, destiny of drug in human body, structural analogues). Active participation of students in seminars.

Laboratory work:

Laboratory work: synthesis, isolation, purification of specific drug substances from the Medicinal Chemistry. Selected examples: acetylsalicylic acid, ascorbic acid, azithromycin, bismuth subgalate, dicumarol, phenytoin, hydrochlorothiazide, calcium carbonate, caffeine, sodium iodide, nicotinamide, pyridoxine, sulfafurazole.</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>Student responsibilities</td><td colspan="6">In accordance to Rules of studying and Deontological code for USSM students.</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></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>1.0</td><td>Oral exam</td><td>3.0</td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td>3.0</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">Final written examination; Oral exam</td></tr>
<tr><td rowspan="6">Required literature (available in the library and via other media)</td><td colspan="4">Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td colspan="4">Marica Medić-Šarić, *Farmaceutska kemija 1, strukture i sinteze*, Farmaceutsko-biokemijski fakultet Sveučilišta u Zagrebu, Zagreb 2008. (Interna skripta)</td><td></td><td></td></tr>
<tr><td colspan="4"></td><td></td><td></td></tr>
<tr><td colspan="4"></td><td></td><td></td></tr>
<tr><td colspan="4"></td><td></td><td></td></tr>
<tr><td colspan="4"></td><td></td><td></td></tr>
</table>

Optional literature (at the time of submission of study programme proposal)	1. Burger's Medicinal Chemistry and Drug Discovery, 6 Volume Set, 6th Edition, D. J. Abraham (Editor), Wiley Interscience, New York 2003. ISBN: 0-471-37032-0 2. Wilson and Gisvold's, Textbook of Organic Medicinal and Pharmaceutical Chemistry, J. B. Lippincott Company, New York 2011. ISBN: 0781734819 3. E. Mutscheler, H. Derendorf, *Drug Actions*, Medpharm Scientific Publisher, Stuttgart, 1995. ISBN: 3-88763-021-1 (Medpharm), ISBN: 0-8493-7774-9 (CRC Press)		
Quality assurance methods that ensure the acquisition of exit competences	▪ Teaching quality analysis by students and teachers ▪ Exam passing rate analysis ▪ Committee for control of teaching reports ▪ External evaluation		
Other (as the proposer wishes to add)			

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">Instrumental Methods of Analysis</td></tr>
<tr><td>Code</td><td>KMF303</td><td>Year of study</td><td colspan="4">3</td></tr>
<tr><td>Course teacher</td><td>Doc. dr. sc. Lea Kukoč Modun</td><td>Credits (ECTS)</td><td colspan="4">6,0</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Maja Biočić, mag. ing. chem. ing.
Andrea Anđić, mag. chem.
Azra Đulović, mag. chem.</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">0 %</td></tr>
<tr><td colspan="6">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="5">The aim of this course is to introduce students to the theoretical principles, practical work and the use of instrumental techniques and procedures relating to the process analysis. The choice of method will depend on the knowledge of the basic principles of individual method or group of methods and the understanding of their advantages and limitations. After completion of a process of learning the learner is able for independent work in instrumental analytical laboratory</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="5">Passed exams from the 2nd year of the Program.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="5">1. Adopt theoretical knowledge related to methods of instrumental analysis (spectrometry, electroanalytical, thermal methods, instrumental separation methods) and the principles of instruments.
2. Correctly interpret the adopted theoretical knowledge relating to methods of analysis instrument and principles of instruments.
3. Explain the connection between basic knowledge of analytical chemistry with application in instrument analysis.
4. Select analytical technique due to the characteristics of the analyte and the specificity of the sample.
5. Integrate acquired knowledge and apply them in problem-solving and decision-making in analytical practice and in process analysis.
6. Adopt theoretical knowledge related to methods of instrumental analysis (spectrometry , electroanalytical , thermal methods , instrumental methods for separation) and principles of instruments and apply knowledge in the experimental work.
7. Select analytical technique due to the characteristics of the analyte and the specificity of the sample.
8. Plan and install an experiment using instrumental techniques.
9. Apply basic statistical analysis of numerical data and graphed the results.
10. Independently take Lab Notes and prepare a report after completion of the analysis.</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="5">1st week
Lectures: Fundamentals of instrumental techniques and their application in continuous and process analysis.
Seminars: Introduction, memento. SI system of units.</td></tr>
</table>

	2nd week Lectures: Planning and optimizing the experiment. Optimizing analytical control of technology process. Seminars: Kinetic method analysis. 3rd week Lectures: Gass chromatography. High performance liquid chromatography. Gass chromatography coloumns and detectors. Seminars: Chromatography (numerical examples). 4th week Lectures: Continuous segmentation flow analysis. Flow injection analysis. Seminars: Flow injection analysis, construction of manifold. 5th week Lectures: Thermal analysis Termogravimetric methods. Differential thermal analysis. Seminars: Thermal analysis (numerical examples). 6th week Lectures: Fundamentals of spectrophotometry. Atomic absorption spectrometry. Flame emission spectrometry. Atomic fluorescence. Atomic emission. Atomic absorption. Seminars: Atomic absorption spectroscopy. 7th week Lectures: Ultraviolet / Visible absorption spectrometry. Seminars: Spectrometry (numerical examples). 8th week Lectures: Infrared absorption spectrometry. Raman spectrometry. Seminars: Spectrometry (numerical examples). 11th week 9th week Lectures: Mass spectrometry. Nuclear Magnetic Resonance Spectrometry, Fotoelectron spectrometry. Auger electron spectrometry. Photoelectron spectroscopy. Analysis of surface with electron beams. Seminars: Mass spectrometry, modern ionisation methods. 10th week Lectures: Microanalysis with electronic sampling. X-ray diffraction analysis. Scanning electron microskop. Seminars: Potentiometry (numerical examples). 11th week Lectures: Electroanalytical methods. Potentiometry. Indicator electrodes. Potentiometric setup. Seminars: Potentiometry (numerical examples). 12th week Lectures: Coulometry. Seminars: Electrogravimetry (numerical examples). 13th week Lectures: Coulometry Seminars: Coulometry (numerical examples). 14th week Lectures: Voltammetry. Seminar: Voltammetry (numerical examples). 15th week Lectures: Amperometry.

<table>
<tr><td></td><td colspan="6">Seminars: Amperometry (numerical examples).

Experimantal part:
1. Kinetic methods of analysis, determoination of tiolic compound using kinetic manifold with spectrophotometric detector.
2. Flow injection analysis, determination of ascorbic acid by flow injection analysis and spectrophotometric detector.
3. UV/Vis spectrophotometry, spectrophotometric measurement of an equilibrium constant.
4. Atomic absorption spectroscopy, determination of metals in real samples.
5. Ions selective electrode, potentiometry, measurement of an equilibrium constant.
6. Electrogravimetric determination, determination or separation of metals.</td></tr>
<tr><td>Format of instruction</td><td colspan="3">x lectures
x 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
x team based learning</td></tr>
<tr><td>Studentresponsibilities</td><td colspan="6">The 70% presence at lectures and seminars. Students must do all laboratory exercises in planned program.</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></td><td>Research</td><td></td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td>5% (0,33 ECTS)</td><td>Report</td><td></td><td>Test of numerical examples</td><td>30 % (1,95 ECTS)</td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>Test of teoretical part</td><td>50 % (3,25 ECTS)</td></tr>
<tr><td>Tests</td><td></td><td>Oral exam</td><td>15 % (0,97 ECTS)</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">Scoring at the exam consists of three basic parts: scoring the experimental part (minimum score 2 , maximum score 4), test of numerical example (minimum score: 18; maximum score: 30) and test of theoretical part (minimum score: 39; maximum score: 65).
Students who had attended lectures and seminar in 70 % can take the exam through partial tests: 2 tests of numerical examples (minimum score: 9; maximum score: 15) and 2 tests of theoretical part (minimum score: 19,5; maximum score: 32,5).
The rating is formed in accordance with the score ranges: sufficient (60 - 70 points) , good (71-80 points) , very good (81-90 points) , excellent (≥91points).</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">D.A. Skoog, D.M. West, F.J. Holler, Osnove analitičke kemije, šesto izdanje (englesko), prvo izdanje (hrvatsko), Školska knjiga, Zagreb, 1999.</td><td>18</td><td></td></tr>
<tr><td colspan="3">Nj. Radić i L. Kukoč Modun, Uvod u analitičku kemiju I. dio, Redak, Split, 2013.</td><td>32</td><td></td></tr>
<tr><td colspan="3">M. Kaštelan-Macan, Kemijska analiza u sustavu kvalitete, Školska knjiga, Zagreb 2003.</td><td>3</td><td></td></tr>
</table>

	I. Piljac, Elektroanalitičke metode, RMC, 1995.	3	
	I. Piljac, Senzori fizikalnih veličina i analitičke metode, Zagreb, 2010.	3	
	Analitika okoliša (ur. M. Kaštelan Macan, M. Petrović), HINUS i FKIT, Zagreb 2013.	3	
	I. S. Krull, Analytical Chemistry, Intech, Rijeka, 2012.		available on web: DOI: 10.5772/3086
	L. Kukoč, Molekulska spektroskopija, Interna recenzirana skripta, 2003.	30 (u ZAK)	available in digital form
	L. Kukoč, Spektrometrijske metode elementne analize, Interna recenzirana skripta, 2005.	30 (u ZAK)	available in digital form
	Josipa Komljenović, Ion selektivna sulfidna elektroda, Interna recenzirana skripta	30 (u ZAK)	available in digital form
Optional literature (at the time of submission of study programme proposal)	1. R. Kellner, J. M. Mermet, M. Otto, M. Valcarcel and H. M. Widmer (Urednici), Analytical Chemistry (A Modern Approach to Analytical Science, Second Edition) Wiley-VCHVerlag Gmbh & Co. KGaA, Weinheim, 2004. 2. D. A. Skoog, D. M. West, F. J. Holler and S. R. Crouch, Fundamentals of Analytical Chemistry, Eighth Edition, Thompson Brooks/Cole, Belmont, USA, 2004. 3. G. D.Christian, Analytical Chemistry, Sixth Edition, John Willey & Sons, INC, 2004. 4. D. Harvey, Modern Analytical Chemistry, McGraw-Hill Higher Education, New York, London, 2000. 5. F. W. Fifield & D. Kealey, Principles and Practice of Analytical Chemistry, Blackwell Science Ltd, Malden MA, London, 2000. 6. M. Kaštelan-Macan, Enciklopedijski rječnik analitičkog nazivlja, FKIT, Mentor, Zagreb 2014.		
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)			

NAME OF THE COURSE	Quality of Natural Medicinal Products						
Code	KMF304	Year of study	3.				
Course teacher	doc. dr Aleksandra Marjanović	Credits (ECTS)	2,0				
Associate teachers		Type of instruction (number of hours)	L	S	E	T	
			15	0	0	0	
Status of the course	Mandatory	Percentage of application of e-learning	0%				

COURSE DESCRIPTION

Course enrolment requirements and entry competences required for the course	Passed exams from the 2nd year of the Program.
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	1. To name and describe the basic terms and definitions for quality of medicinal products and the systems for quality control: Good Manufacture practise (GMP), HACCP 2. To recognize, describe and explain the basic documentation of the systems for quality control, and the methods and procedures used for testing the quality of natural medicinal products 3. To properly perform the testing and quality control of a particular natural medicinal product 4. To interpret the legislation regarded to the quality of natural medicinal products
Course content broken down in detail by weekly class schedule (syllabus)	Complex composition of plant material. Analytical profile of particular species of medicinal plants. Elements of quality system adapted to natural medicinal products. Formulation of specifications for natural medicinal products. Peculiarity of natural constituents (phytoconstituents). Regular sampling. Application of spectroscopic (UV/VIS, IR, AAS, NMR), chromatographic (TLC, HPTLC, HPLC, GC) and electrophoresis (CE, MEKC) methods and procedures. Quality assessment of the measured results and quality assurance. Law regulations in the area of natural medicinal products. Development of standardized parameters. Stability of natural medicinal products. Ethobotanical role in the judgement of quality of plant drugs.
Format of instruction	☒ lectures ☐ seminars and workshops ☐ exercises ☐ *on line* in entirety ☐ partial e-learning ☐ field work ☐ independent assignments ☐ multimedia ☐ laboratory ☐ work with mentor ☒ consultations
Student responsibilities	In accordance to Rules of studying and Deontological code for USSM students.

Screening student work *(name the proportion of ECTS credits for each activity so that the total number of*						
	Class attendance		Research		Practical training	
	Experimental work		Report		(Other)	
	Essay		Seminar essay		(Other)	

ECTS credits is equal to the ECTS value of the course)	Tests		Oral exam		(Other)	
	Written exam	2.0	Project		(Other)	
Grading and evaluating student work in class and at the final exam	Written exam.					

	Title	Number of copies in the library	Availability via other media
Required literature (available in the library and via other media)	Guideline on Quality of Herbal Medicinal Products / Tradicional Herbal Medicinal Products (2005)	0	Yes
	Guidelines on Specifications: Test Procedures and Acceptance Criteria for Herbal Substances, Herbal Preparations and Herbal Medicinal Products / Traditional Herbal Medicinal Products (2006)	0	Yes
	Note for Guidance on Quality of Herbal Medicinal Products, European Agency for the Evaluation of Medicinal Products (2006)	0	Yes
	Quality Control Methods for Medicinal Plant Materials, WHO, Geneva, 1998.	0	Yes
	Hand-outs		

Optional literature (at the time of submission of study programme proposal)	• P. K. Mukherjee. Quality Control of Herbal Drugs: An Approach to Evaluation of Botanicals, Business Horizons, New Delhi, 2002; • WHO guidelines on good manufacturing practices (DPP) for herbal medicines, 2007; • WHO guidelines on good agricultural and collection practices GACP) for medicinal plants, 2003; • Guideline on Good Agricultural and Collection Practice (GACP) for Starting Materials of Herbal Origin, 2006; • Zakon o lijekovima (NN 76/13); • Pravilnik o davanju odobrenja za stavljanje lijeka u promet (NN 83/13); • Pravilnik o stavljanju u promet te označavanju i oglašavanju tradicionalnih biljnih lijekova (NN 89/10); • Pravilnik o zdravstvenoj ispravnosti predmeta široke potrošnje (NN 125/09 i 23/13); • Pravilnik o dodacima prehrani (NN 46/11 i 41/13);
Quality assurance methods that ensure the acquisition of exit competences	▪ Teaching quality analysis by students and teachers ▪ Exam passing rate analysis ▪ Committee for control of teaching reports ▪ External evaluation
Other (as the proposer wishes to add)	

NAME OF THE COURSE	Physical Biochemistry					
Code	KMF305	Year of study	3.			
Course teacher	full prof. Mladen Miloš	Credits (ECTS)	3.5			
Associate teachers		Type of instruction (number of hours)	L	S	E	F
			15	15		
Status of the course	basic	Percentage of application of e-learning	33%			

COURSE DESCRIPTION

Course objectives	The goal of course Physical biochemistry is to connect and comprehensive understanding of the knowledge that students have gained learning courses of Physical Chemistry and Biochemistry.
Course enrolment requirements and entry competences required for the course	Completed the first two years of study Pharmacy.
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Understanding (1) the application of thermodynamic principles in biochemistry, (2) the concept of chemical equilibrium, (3) chemical kinetics, (4) electrochemical processes, (5) bioenergetics and membrane processes and (6) the modern methods in biochemistry.
Course content broken down in detail by weekly class schedule (syllabus)	Introduction, Concepts of Thermodynamics in Biochemistry (1 hour). Acids, bases and buffers in biochemistry (titration curves and electric charge, titration curves and protein isoelectric point) (1 hour). Thermodynamic concepts in biochemistry (open systems and the environment, work, energy and heat, the tool states, entropy and Gibbs free energy, thermodynamics and metabolism (2 hours). Bioenergetics and mebranski transfers (1 hour). Biochemical reactions and balance (2 hour) . Electrochemistry and biochemical processes (2 hour). interaction of protein - ligand (dissociation constant of singlet binding sites, dissociation constant of the inhibitor, the number of binding sites, thermodynamics of protein-ligand interactions (3 hours). Chemical kinetics of biochemical reactions, enzyme kinetics (2 hours) . Spectroscopic methods in biochemistry (1 hour).
Format of instruction	x lectures x seminars and workshops x exercises ☐ *on line*in entirety x partial e-learning ☐ field work x independent assignments x multimedia ☐ laboratory ☐ work with mentor ☐ (other)
Studentresponsibilities	

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	
	Experimental work		Report		(Other)	
	Essay		Seminar essay	1	(Other)	
	Tests		Oral exam	0,5	(Other)	
	Written exam		Project		(Other)	

Grading and evaluating student	Activity during attendance, presentation of seminar papers in the form of a Power Point presentation and final oral exam.

<table>
<tr><td>work in class and at the final exam</td><td colspan="3"></td></tr>
<tr><td rowspan="8">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>Internal script Physical Biochemistry</td><td>-</td><td>Web page of Faculty</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="3">- N. C. Price et al., Principles and problems in Physical chemistry for Biochemists, Third edition, Oxford University Press, Oxford, 2001.
- P. Atkins and J. De Paula, Physical chemistry, 8ed, Oxford University Press, Oxford, 2006.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="3">Monitoring of quality assurance will be performed at three levels: (1) University, (2) Faculty Level by Quality Control Committee, (3) Level of teachers.</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="3"></td></tr>
</table>

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="6">Pharmaceutical Chemistry II</td></tr>
<tr><td>Code</td><td>KMF306</td><td>Year of study</td><td colspan="4">3</td></tr>
<tr><td>Course teacher</td><td>prof. dr. sc. Davorka Završnik</td><td>Credits (ECTS)</td><td colspan="4">4,5</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>T</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">0%</td></tr>
<tr><td colspan="6">COURSE DESCRIPTION</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="5">Passed exams from the 2nd year of the Program.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="5">1. To acquire knowledge about chemical formulas of drugs and their pathways of synthesis

2. To recognize the structure properties related to drug’s activity

3. To discuss the effect of a drug, related to its structural properties

4. To identify all steps in pathways of synthesis of drugs

5. To recognize the chemical groups responsible for the therapeutic effect of a drug

6. To describe and explain the role of pro-drugs and to assess the toxicological potential of a drug</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="5">Lectures: Drugs affecting the central nervous system: General anesthetics, Local anesthetics, Hypnotics, Analgesics (+ Anti-inflammatory drugs), Antiepileptics, Analeptics, Antiparkinsonian drugs, Psychoactive drugs. Drugs affecting the peripheral nervous system: Sympathomimetics, Sympatolytics, Parasympathomimetics, Spazmolytics, Muscule relaxants, Drugs affecting ganglia. Antianginals. Antihypertensive drugs. Cardiac glycosides. Antiarrhythmics. Lipid regulating agents. Diuretics. Hormones and hormone antagonists. Antihistaminines. Vitamins. Anticoagulants. Prostaglandines. Uricosuric drugs. Antiemetics. Immunosuppressants. Antipsoriatic drugs. Expectorants.
Seminars: As this subject covers different therapeutic groups based on their mechanism of action seminars are introduced as necessity for facilitating students managing their knowledge from lectures for these groups of medications: Antianginals (Organic nitrates, Calcium antagonists, β-Blockers), Antihypertensives (Diuretics, β-blockers, Ca-antagonists, α_1-blockers, ACE inhibitors, AT_1-antagonists), Common cold (Analgoantipyretics, α-sympathomimetics, H_1-Antihistamines, Surface anesthetics, Antitussives, Mucolytics, Expectorants), Management of allergies and asthma (H_1-antihistamines, α-sympathomimetics, β_2-sympathomimetics, Theophylline, Glucocorticoids, Leukotriene receptor antagonists), Antiemetics (Parasympatholytics, H_1-antihistamines, Dopamine antagonists, 5-HT_3-antagonists).</td></tr>
<tr><td>Format of</td><td colspan="2">☒ lectures</td><td colspan="3">☐ independent assignments</td></tr>
</table>

<table>
<tr><td>instruction</td><td colspan="6">☒ seminars and workshops
☐ exercises
☐ on line in entirety
☐ partial e-learning
☐ field work</td><td colspan="2">☐ multimedia
☐ laboratory
☐ work with mentor
☒ consultations</td></tr>
<tr><td>Student responsibilities</td><td colspan="8">In accordance to Rules of studying and Deontological code for USSM students.</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></td><td>Research</td><td></td><td>Practical training</td><td colspan="3"></td></tr>
<tr><td>Experimental work</td><td></td><td>Report</td><td></td><td>(Other)</td><td colspan="3"></td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>(Other)</td><td colspan="3"></td></tr>
<tr><td>Tests</td><td></td><td>Oral exam</td><td>2.0</td><td>(Other)</td><td colspan="3"></td></tr>
<tr><td>Written exam</td><td>2.5</td><td>Project</td><td></td><td>(Other)</td><td colspan="3"></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">Final written examination; Oral exam</td></tr>
<tr><td rowspan="2">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">B. Zorc, Farmaceutska kemija - odabrana poglavlja, Farmaceutsko-biokemijski fakultet, Zagreb, 2001; ISBN 953-6256-32-0;

Burger's Medicinal Chemistry and Drug Discovery. Sixth Edition, John Wiley & Sons, Inc., 2003.

FOYE'S Principles of Medicinal Chemistry, (Eds. T. L. Lemke, D. A. Williams), 6th ed., Wolters Kluwer / Lippincott Williams & Wilkins, Philadelphia 2008, ISBN 978-0-7817-6879-5;

E. Mutschler, H. Derendorf, Drug Actions, Medpharm Scientific Publishers, Stuttgart, 1995; ISBN 3-88763-021-1 (Medpharm), ISBN 0-8493-7774-9 (CRC Press);

C. G. Wermuth (Ed.), The Practice of Medicinal Chemistry, Academic Press, San Diego, 1996, ISBN 0-12-744640-0.</td><td></td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="8">New Drugs, J. Freely, Ed., BMJ Publishing Group, London, 1994; ISBN 0 7279 0821 9.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="8">▪ Teaching quality analysis by students and teachers
▪ Exam passing rate analysis
▪ Committee for control of teaching reports
▪ External evaluation</td></tr>
<tr><td>Other (as the proposer wishes to</td><td colspan="8"></td></tr>
</table>

add)	

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="6">Pharmacopoeia</td></tr>
<tr><td>Code</td><td>KMF307</td><td>Year of study</td><td colspan="5">3</td></tr>
<tr><td>Course teacher</td><td>rof.dr.sc. Siniša Tomić</td><td>Credits (ECTS)</td><td colspan="5">5.0</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">M. Biočić, asistent

J.Jelaska, MPharm</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>T</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="5">0%</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">Passed exams from the 2nd year of the Program.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">1. To describe the legal framework for drug regulation in Croatia and EU, and the responsible institutions on both national and European level

2. To prepare the data from R&D of a drug that are required as documentation for the drug registration proces

3. To differentiate the application of quality control process for manufactures, pharmacies and regulatory bodies

4. To handle the quality control standards in pharmacy drug manufacturing

5. To differentiate the application of quality control for the active compound and the drug formulation

6. To explain the development tof a generic drug, from the quality point of view

7. To distinguish different documentation reports for drug quality of active compound in drug dossie

8. To explain the preparation of monography for Euopean and Croatian pharmacopeias</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="6">The historical development of pharmacopeias. Regulations applicable to general chapters and to monographs (materiae medicae). The content of materia medica. Quality standards for materia medica: active substances, ancillary substances, products from blood and plasma, human and animal vaccines, plant-based medications, homeopathic products, radiopharmaceuticals, bandages and surgical material, and pharmaceutical forms. An overview of analytical methods and procedures, containers, reagents and general articles. National characteristics of the Croatian pharmacopeia. The content of the monograph: titles, relative atomic and molecular masses, description, properties, identification, examination and content, preservation, labelling, warnings, adulterations, comparative substances, comparative preparations and comparative spectra. Information from the drug nomenclature. Monograph fund. Pharmacopeial regulations. Dimensions.</td></tr>
</table>

	Reagents. Special terms. The most common syntagms. Mass and volume. External appearance. Odour. Physical constants. Solubility. Hygroscopicity. The standard temperature unit. Prefixes. Ranges. Stereochemical labelling. Isotopically modified compounds. Procedures: identification, purity assessment, content or activity assessment. Preparatory procedures. Statement of content. How to define limits in monographs and how to use them. Setting and using limits of content. Testing the limits of content in pharmacopeia. Scope of use.

Format of instruction	☒ lectures ☒ seminars and workshops ☒ exercises ☐ *on line* in entirety ☒ partial e-learning ☐ field work	☒ independent assignments ☐ multimedia ☒ laboratory ☐ work with mentor ☒ consultations
Student responsibilities	In accordance to Rules of studying and Deontological code for USSM students.	

Screening student work *(name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)*						
	Class attendance	0.5	Research		Practical training	
	Experimental work		Report		Homework	0.5
	Essay	1	Seminar essay	0.5	(Other)	
	Tests	1	Oral exam		(Other)	
	Written exam	1.5	Project		(Other)	

Grading and evaluating student work in class and at the final exam	Written test.

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Hrvatska farmakopeja s komentarima 2007	5	
	Hrvatska farmakopeja 2007		Yes
	ICH smjernice		Yes
	Pravilnik o postupku i načinu davanja odobrenja za stavljanje u promet gotovog lijeka		Yes
	Pravilnik o kontroli kakvoće lijekova		Yes

Optional literature (at the time of submission of study programme proposal)	Grdinić, Ilustrirana povijest farmakopeje, Medika, Zagreb, 2001.; Technical guide for the elaboration of monographs, Pharmeuropa, Strasbourg, 1996./EDQM, 2005.; O. Pedersen, Pharmaceutical Chemical Analysis: Methods for Identification and Limit Tests, CRC Press, Boca Raton, 2006.; V. Grdinić, R. Jurišić, I. Šugar, Enciklopedijski englesko-hrvatski farmakognozijski

	rječnik farmakopejskog nazivlja, Hrvatski zavod za kontrolu lijekova, Zagreb, 1999.
Quality assurance methods that ensure the acquisition of exit competences	▪ Teaching quality analysis by students and teachers ▪ Exam passing rate analysis ▪ Committee for control of teaching reports ▪ External evaluation
Other (as the proposer wishes to add)	

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">Molecular Biology with Genetics</td></tr>
<tr><td>Code</td><td>KMF308</td><td>Year of study</td><td colspan="4">3</td></tr>
<tr><td>Course teacher</td><td>Prof. dr. Janoš Terzić.

Prof. dr. Jasna Puizina</td><td>Credits (ECTS)</td><td colspan="4">5.5</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Prof. dr. Ivana Marinović Terzić
Doc. dr. Ivana Novak Nakir
Dr. sc. Jelena Korać Prlić
Dr. sc. Boris Mihaljević
Mag. Mol. biol. Mija Marinković
Dipl. ing. Marina Degoricija
Bacc. lab.med. diag. Sandra Vujević</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>T</td></tr>
<tr><td>30</td><td>18</td><td>27</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">0%</td></tr>
<tr><td colspan="6">COURSE DESCRIPTION</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="5">Passed exams from the 2nd year of the Program.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="5">Describe the structure of human genome and 'average' genes. Explain the definitions and learn basic rules of inheritance using basic examples. Learn how to use the genetic terminology. Significance of mutations. Explain the autosomal and sex-linked inheritance. Learn to recognize correct inheritance type. Use of basic genetic techniques in the context of basic genetic discoveries. Basic examples of pharmacogenomics importance. Understanding the connection between cancer genetics and polygenetic phenotypic characteristics. Learning the importance of modern genetic breakthroughs including gene therapy, genetically modified organisms and stem cell research. Comparison and usage of different gene and protein databases.</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="5">Lectures: DNA structure and replication, transcription, translation. Control of gene expression. DNA mutations, DNA repair, human diseases with deficient DNA repair, ageing. Recombinant DNA technology, restriction endonucleases, making recombinant DNA molecules, vectors, amplification of DNA by polymerase chain reaction (PCR), sequencing, cloning of DNA in prokaryotic and eukaryotic host cells, characterization and expression of the cloned DNA. Libraries of genes and cDNA. Electrophoresis and visualization of nucleic acids and proteins. Nucleic acid hybridization, DNA chip. Transgenic organisms and knock-out models.

Laws of inheritance: mendelian (autosomal and X-linked) and non-mendelian inheritance (polygene, mitochondrial, uniparent disomy). Sex determination. Gene linkage and genetic recombination. Cytogenetics and human karyotype. Epigenetics and genomic imprinting. Imunogenetics. Cancer, oncogenes and tumor-supressor genes. Genetically modified organisms. Gene therapy. Genomics</td></tr>
</table>

	and the human genome project. Reproductive technologies, ethic dilemmas. Role of bioinformatics in molecular biology. *Seminar:* Students work on numerical exercises and problems, discuss about ethic problems and dilemmas. Students will have to prepare presentation of recent genetic discoveries. *Exercises:* DNA extracting, PCR amplification, restriction *digestion*, DNA gel-electrophoresis. Identification of GM food. DNA identification of humans by DNA fingerprinting. Pedigree analysis. Determination of blood groups and Rh factor. Barr's body in females Preparation of the human chromosomes by peripheral blood cell culture. Mapping of the genes on human chromosomes by fluorescence in situ hybridization of (FISH technique). Localization of proteins in cells by immunostaining. Work with fluorescence microscope, taking pictures and their analysis. Cloning DNA, transfection and transformation experiments. Site-specific mutagenesis. Gene expression will be measured with RT-PCR experiments and luciferase assay. Bioinformatics practical will include search of PubMed, OMIM and primer design. Bioinformatics analysis of proteins.
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)
Student responsibilities	In accordance to Rules of studying and Deontological code for USSM students.

Screening student work *(name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)*						
	Class attendance	1.0	Research		Practical training	1.0
	Experimental work		Report	1.0	(Other)	
	Essay		Seminar essay	1.0	(Other)	
	Tests		Oral exam		(Other)	
	Written exam	1.5	Project		(Other)	

Grading and evaluating student work in class and at the final exam	Final written test.

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	1. G. M. Cooper, R. E. Hausman, 2004: Stanica-molekularni pristup, Treće izdanje, Medicinska naklada, Zagreb 2004	15	

Optional literature (at the time of submission of study programme	1. Human molecular genetics. Strachan T, Read AP. 4th ed. New York (NY): Garland Science, Taylor & Francis Group; 2010. 2. J. Puizina, Praktikum iz molekularne biologije, Interna skripta, Fakultet

proposal)	prirodoslovno-matematičkih znanosti i odgojnih područja Sveučilišta u Splitu, 2005
Quality assurance methods that ensure the acquisition of exit competences	▪ Teaching quality analysis by students and teachers ▪ Exam passing rate analysis ▪ Committee for control of teaching reports ▪ External evaluation
Other (as the proposer wishes to add)	

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="6">General Pharmacology</td></tr>
<tr><td>Code</td><td>KMF309</td><td>Year of study</td><td colspan="5">3.</td></tr>
<tr><td>Course teacher</td><td>prof. dr. sc. Darko Modun</td><td>Credits (ECTS)</td><td colspan="5">6.0</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Ana Šešelja Perišin, mag. pharm.</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>T</td></tr>
<tr><td>30</td><td>45</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="5">0%</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">Passed exams from the 2nd year of the Program.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">1. Describe and explain the general principles of drugs absorption, distribution, metabolism and elimination.
2. List and name the most important parameters that influence drug bioavailability
3. Calculate different PK parameters for drug applied IV , and PER OS
4. Describe and explain the general principles of drug binding to the receptor and its activation
5. List and name the most important parameters that influence drug efficacy and adverse effects, including interactions and pharmacogenetics
6. Describe and explain drug administration routes, main indications, contraindications and side effects of the drugs that are illustrative example of pharmacotherapeutic groups – pharmacology of ANS.
7. Review significant drug interactions and relate them with the drugs pharmacokinetic and pharmacodynamic properties – pharmacology of ANS.</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="6">ADME (absorption, distribution, metabolism, elimination) system. Drug absorption and factors affecting it (site and route of application, interactions drug – organism, drug – food, drug – drug) Drug transport through tissue barriers and factors affecting drug distribution in the organism. Enzymatic systems contributing to the drug biotransformation. Drug elimination by zero and first order kinetics. Analysis and calculation of pharmacokinetic parameters. Clearance, Volume of Distribution and $t_{1/2}$. Bioavailability and biological equivalence of drugs. General principles of action of drugs. Mechanisms of action of drugs and classifications of receptors. Classifications of agonists and antagonists. Analysis of drug-response curves and calculations of pharmacodynamic parameters. ED_{50}, LD_{50}, therapeutic index and safety factor. Methods and measurements in pharmacology. Individual variability and drug interactions. Adverse drug effects. Gene therapy. Research and development of drugs. Pharmacology of ANS.</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
☒ consultations</td></tr>
<tr><td>Student responsibilities</td><td colspan="6">In accordance to Rules of studying and Deontological code for USSM students.</td></tr>
</table>

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

Grading and evaluating student work in class and at the final exam	Final written and oral exam.		
Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	-Katzung BG, Masters S, Trevor AJ, urednici. "Temeljna i klinička farmakologija", 1. hrvatsko izdanje, Zagreb, Medicinska naklada, 2011.	15	
	- Modun D, Bach-Rojecky L, urednici. "Priručnik o virtualnom pokusima iz farmakologije", Split, Medicinski fakultet Sveučilišta u Splitu, 2013.	0	Yes
Optional literature (at the time of submission of study programme proposal)	- Kunec Vajić E. "Farmakokinetika". Zagreb, Medicinska naklada, 2004. - Birkett DJ. "Pharmacokinetics Made Easy, Revised", McGraw-Hill Book Company Australia, 1st edition, 2002. - Jambhekar SS, Breen PJ. "Basic Pharmacokinetics", Pharmaceutical Press, 1st edition, 2009.		
Quality assurance methods that ensure the acquisition of exit competences	▪ Teaching quality analysis by students and teachers ▪ Exam passing rate analysis ▪ Committee for control of teaching reports ▪ External evaluation		
Other (as the proposer wishes to add)			

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">Operations in Pharmaceutical Technology</td></tr>
<tr><td>Code</td><td>KMF310</td><td>Year of study</td><td colspan="4">3 rd</td></tr>
<tr><td>Course teacher</td><td>Prof. dr. sc. Nenad Kuzmanić</td><td>Credits (ECTS)</td><td colspan="4">5.0</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Dr. sc. Sandra Svilović, assistant professor
Dr. sc. Marija Ćosić, assistant professor
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>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 purpose of this course is to acquaint the students with a systematic approach to the solution of problems relate the inputs and outputs of manufacturing systems. Gaining knowledge about the principles of momentum, heat and mass transfer essential for a fuller understanding of the pharmaceutical process engineering. Students are also acquainted with basic unit operations in the pharmaceutical technology and with the working principles of the most used devices.</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 passing the exam the student is expected to know:
– to write the material balances for a specific operation of pharmaceutical technology,
– fundamental principles of mechanical and of heat and mass transfer operations,
– explain the laws that follow the performance of the each individual unit operation,
– explain the influence of operating variable on the each operation performance,
– suggest the most common used equipments for particular operation and explain their working principle,
– bring up some of the most common operating problems encountered in the pharmaceutical industry.</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="5">1st week: Introduction to pharmaceutical process technology. Process classification and process variables. Writing of material and energy balances in the pharmaceutical process engineering.
2nd week: Reactors and bioreactors in the pharmaceutical processes.
3rd week: Introduction to physical transport phenomena. Rate of transport processes. Momentum, heat and mass fluxes.
4th week: Molecular and convective transport mechanisms. Fluid characteristics. Flow phenomena. Flow around obstacles. Rate of sedimentation. Flow through beds of particles.
5th week: Mechanical separations in the pharmaceutical technology. Gravity sedimentation process. Equipment for sedimentation.
6th week: Centrifugal sedimentation and filtration. Equipment for centrifugal sedimentation and filtration.
7th week: Contacting operations. Agitation and mixing of liquids, solid-liquid mixing (solid suspension), mixing of solids. Mixing equipment in the pharmaceutical technology.
8th week: Size reduction operation and equipment for size reduction in the</td></tr>
</table>

<table>
<tr><td></td><td colspan="6">pharmaceutical engineering. Granulometric analysis.
9th week: Fundamental principles of heat transfer.
10th week: Heat -exchange equipment in the pharmaceutical technology: Heat exchangers. Vaporizers.
11th week: Fundamental principles of mass transfer. Stationary diffusion. Mass transfer with forced convection. Interphase mass transfer.
12th week: Heat and mass transfer operations in pharmaceutical technology. Principles of drying. Drying equipment.
13th week: Distillation. Distillation equipment.
14th week: Theory of crystallization. Crystallization equipment
15th week: Leaching and extraction. Leaching equipment. Extraction equipment.

Laboratory exercises:

1. Determination of fluid flow type and the critical Reynolds number.
2. Flow through beds of particles: Fluidization - determination of fluidized bed characteristics.
3. Filtration - determination of filtration coefficient and filtration cake resistance.
4. Mixing of liquids. Mixing in the solid-liquid systems (suspension of settling and floating solids).
5. Milling - determination of degree of reduction.
6. Drying rate determination.
7. Heat exchanger - determination of partial and overall heat transfer coefficient.
8. Batch cooling crystallization – determination of kinetic of nucleation and crystal growth.
10. Exraction.</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
x multimedia
x 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>1.5</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>Exercises tests study (Other)</td><td>0.5</td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>Report from the exercises (Other)</td><td>0.5</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>2.0</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">During the semester student may pass the complete exam by taking two theoretical partial tests. Tests are consisted of questions from lectures and seminars. Test passing score is 55%. After passing both tests, the overall grade for theoretical 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 overall grade of theoretical part and the grade of laboratory exercises (passing score 50-100%). Theoretical part constitutes 65%</td></tr>
</table>

<table>
<tr><td></td><td colspan="3">of grade while laboratory exercises by 35 %. Students who do not pass the partial tests have to take an exam in the regular examination periods. Final grade is determined by previously notated criteria.</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>A.J. Hickey, D. Ganderton, Pharmaceutical process Engineering, Dekker, Inc., 2nd ed., New York, 2001.</td><td>1</td><td></td></tr>
<tr><td>W. L. McCabe, J. C. Smith, P. Harriott, Unit Operations of Chemical Engineering, 7th ed., McGraw-Hill, New York, 2004.</td><td>2</td><td></td></tr>
<tr><td>J. Welty, J. W. Wicks, R. E. Wilson, G. L. Rorrer, Fundamentals of Momentum, Heat and Mass Transfer, 5th ed., J. Wiley & Sons Inc., New York, 2007.</td><td>2</td><td></td></tr>
<tr><td>R. Byron Bird, W. E. Stewart, E. N. Lightfoot, Transport Phenomena, 2nd ed., J. Wiley and Sons Inc., New York, 2002.</td><td>2</td><td></td></tr>
<tr><td>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>Optional literature (at the time of submission of study programme proposal)</td><td colspan="3">Hraste, Mehaničko procesno inženjerstvo, 2. izdanje, HINUS, Zagreb, 2003.
M. Levin, Pharmaceutical Process Scale-Up, Taylor and Francis, 2nd ed., London, 2007.,
R. M. Felder, R. W. Rousseau, Elementary Principles of Chemical Processes, 3rd ed., John Wiley & Sons, Inc., New York, 2005.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="3">- monitoring of students suggestions and reactions during semester
- students evaluation organized by University</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="3"></td></tr>
</table>

Course title	Phytotherapy		
Course code	KMFI13		
Type of course	Lectures, seminars, exercises (15+0+15)		
Level of course	Elective		
Year of study	3rd year	**Semester**	V. or VI.
ECTS (Number of credits allocated)	3.0		
Name of lecturer	Dr. Igor Jerković, associate professor		
Learning outcomes and competences	Students will enquire knowledge of basic principles of rational phytotherapy, active components of plant drugs and mechanisms of action of active components, procedures for quality assurance and control of active components and plant drugs. Furthermore, student will be able to have critical approach toward particular plant drug, will be able to evaluate relation usefulness/harmfulness of the particular plant drugs, will be introduced to indications, contraindications, undesired actions and interactions of plant drugs.		
Prerequisites	Pharmacognosy		
Course contents	Place and role of phytotherapy in primary health care, self healing and drugs that contain plant drugs or preparatives from plant drugs as active components. Rational and traditional phytotherapy. Plant drugs and law regulations. Types of plant drugs. Quality assurance for plant drugs. Safe application of plant drugs: indications, dosage, contraindications, undesired action, interactions, modes of cautions. Application of plant drugs on functional disorders and illness of central nerve, cardiovascular system, respiration, gastrointestinal and urogenital tract, skin and metabolism disorders. Plant drugs with anti-inflammatory, antimicrobial, antioxidant and cytostatic action.		
Recommended reading	V. Schulz, R. Haensel, V. E. Tyler, Rational Phytotherapy, Springer-Verlag, Berlin, 2001.; M. Blumenthal, Ed. The ABC Clinical Guide to Herbs. American Botanical Council, Austin, 2003.		
Supplementary reading	ESCOP Monographs. Georg Thieme Verlag, Stuttgart, 2003.; M. Heinrich, J. Barnes, S. Gibbons, E. Williamson, Fundamentals of Pharmacognosy and Phytotherapy, Churchill Livingstone, Edinburgh, 2004.		
Teaching methods	Lectures and exercises		
Assessment methods	Written and/or oral examination.		
Language of	Croatian		

instruction	
Quality assurance methods	Quality assurance will be performed at three levels: (1) University Level, (2) Faculty Level by Quality Control Committee, (3) Lecturer's Level.

Course title	Drug stability		
Course code	KMFI14		
Type of course	Lectures, seminars, laboratory exercises (15+0+15)		
Level of course	Elective		
Year of study	3rd year	**Semester**	V. or VI.
ECTS (Number of credits allocated)	3.0		
Name of lecturer	Dr. Mladen Miloš, full professor		
Learning outcomes and competences	During this course the students learn the basis of the drug stability.		
Prerequisites	Competence required by courses Pharmaceutical chemistry and Physical biochemistry.		
Course contents	Introduction to study of drug stability. Potential adverse effects in drug stability. Functional change in drug with aging. Increase in concentration of active. Formation of degradation products. Reasons and modes of degradation: physical, chemical, biological. Effect of primary package on drug stability. Reasons for stability testing. Methods for testing of chemical, physical and biological drug stability. Modes of stabilization of drug products. Conformance periods, shelf lives and expiration dates. Regulatory aspects of drug stability.		
Recommended reading	J. T. Carstersen and C. T. Rhodes, (ed.) Drug Stability: Principles and Practices, 3rd edition, Mercel Dekker, New York (2000).		
Supplementary reading	Croatian pharmacopea with comments, Croatian pharmaceutical society, 2007.		
Teaching methods	Lectures, seminars, laboratory exercises.		
Assessment methods	Oral examination, written examination, written and oral examination		
Language of instruction	Croatian		
Quality assurance methods	Quality assurance will be performed at three levels: (1) University Level, (2) Faculty Level by Quality Control Committee, (3) Lecturer's Level.		

NAME OF THE COURSE	Cosmetology					
Code	KMFI15	Year of study	3			
Course teacher	Prof. dr sc. Neira Puizina-Ivić,	Credits (ECTS)	3			
Associate teachers	mr.sc. Ina Topić, mag. pharm dr sc. Deny Anđelinović, dr. med.	Type of instruction (number of hours)	L	S	E	T
			15	0	15	
Status of the course	Elective	Percentage of application of e-learning	0%			

COURSE DESCRIPTION

Course enrolment requirements and entry competences required for the course	According to the School's Ordinance on Studying.
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Describe and explain the basic structure and function of the skin and appendages. Describe and explain the cosmetic ingredients. Describe and explain the skin cleansing and skin care products. List the most important skin products for specific indication in cosmetology. List and explaint the application, indication, contraindication and side-effects of specific cosmetic ingredients.
Course content broken down in detail by weekly class schedule (syllabus)	Course definition, relationship with pharmacy and medicine. Classification of cosmetology. Basic informations on skin, hair, nails... Ingredients for the cosmetic products production. Natural cosmetic ingredients: inorganic and organic compounds, hormones, enzymes, vitamins. Semi-synthetic and synthetic cosmetic ingredients. Active and supplementary cosmetic ingredients: surfactants, emollients, thickeners, preservatives, antioxidants, colorants. Skin cleansing and skin care products, decorative cosmetic products. Ingredients for sunscreen products (ultraviolet filters) and sunscreen products. Side effects of cosmetic ingredients/products on skin, hair and nails. Fragrances: Types of fragrances. Odor classification. Perfumery ingredients: natural, nature-identical, synthetic.
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)
Student responsibilities	In accordance to Rules of studying and Deontological code for USSM students.

Screening student work *(name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)*						
	Class attendance		Research		Practical training	
	Experimental work		Report		(Other)	
	Essay		Seminar essay		(Other)	
	Tests		Oral exam		(Other)	
	Written exam		Project		(Other)	

<table>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="3">Final written test.</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>1. M. Čajkovac, Kozmetologija, Naklada Slap, Zagreb, 2000.</td><td></td><td></td></tr>
<tr><td>2. J. Bruneton, Pharmacognosy, Phytochemistry, Medicinal Plants, Lavoisier publishing Inc., Paris, 1995.</td><td></td><td></td></tr>
<tr><td>3. The Chemistry of Fragrances, 2nd edition, edited by C. S. Sell, RSC Publishing, Cambridge, 2006.</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="3">1. M. Čajkovac, I. Štivić, Praktikum Kozmetologije, Sveučilišna naklada Liber, Zagreb, 1980.

2. D. Kuštrak, Farmakognozija - fitofarmacija, Golden marketing - Tehnička knjiga d.d., 2005.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="3">▪ Teaching quality analysis by students and teachers
▪ Exam passing rate analysis
▪ Committee for control of teaching reports
▪ External evaluation</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="3"></td></tr>
</table>

Course title	Aromatherapy		
Course code	KMFI16		
Type of course	Lectures, seminars, exercises (15+0+15)		
Level of course	Elective		
Year of study	3rd year	**Semester**	V. or VI.
ECTS (Number of credits allocated)	3.0		
Name of lecturer	Dr. Igor Jerković, associate professor		
Learning outcomes and competences	General knowledge on aromatic plants and essential oils (physical and chemical characteristics), conventional and non-conventional modern methods of the oil isolation, their quality (chemical composition, biological activity) and application in pharmaceutical preparatives and aromatherapy.		
Prerequisites	-		
Course contents	Essential oils – definition and pharmaceutical significance. Role in plants. Chemotaxonomy. Chemical composition: structures of monoterpenes, sesquiterpenes, phenylpropane derivatives and other compounds. Isoprenic rule. Biogenesis of terpenes from 3-isopentenyl pyrophosphate over mevalonic acid and deoxycellulose phosphate pathway. Processing of aromatic plants – conventional and modern methods of oil isolation: distillation (hydro, hydro-steam and steam distillation), simultaneous distillation-extraction, extraction with organic solvents. Quality and analysis of essential oils: basic physical and chemical values, application of chromatographic techniques (particularly gas chromatography with different detectors). Actual use of essential oils – pharmaceutical preparates, aromatherapy (antibacterial and antioxidant action). Undesirable actions. Survey of selected essential oils and aromatic plants in Croatia with chemical composition and useful applications.		
Recommended reading	E. Guenther, The Essential Oils: History-Origin in Plants-Production-Analysis, vol. I, Krieger Publishing Company, 1989.; S. V. Bhat, B. A. Nagasampagi, M Sivakumar, Chemistry of Natural Products, Springer-Narosa, 2005.; Tehnička enciklopedija, Vol. 5, str. 360-370, JLZ, Zagreb, 1976.		
Supplementary reading	J. Lawless, The Illustrated Encyclopedia of Essential Oils: The Complete Guide to the Use of Oils in Aromatherapy and Herbalism (Illustrated Encyclopedia), Element Books, 1995.		
Teaching methods	Lectures and practicals.		
Assessment	Oral exam		

methods	
Language of instruction	Croatian
Quality assurance methods	Quality assurance will be performed at three levels: (1) University Level, (2) Faculty Level by Quality Control Committee, (3) Lecturer's Level.

Course title	Genetic diversity of autochthonous plants		
Course code	KMFI17		
Type of course	Lecture, seminars, practicum (15+0+15)		
Level of course	Elective		
Year of study	3rd year	**Semester**	V. or VI.
ECTS (Number of credits allocated)	3.0		
Name of lecturer	Dr. Šimun Anđelinović, full professor		
Learning outcomes and competences	*The students will be acquainted with the following:* Techniques of autochthonous plant genome analysis (olives, figs carobs, maraska cherry, agrumes, strawberry trees, grapes, almonds, aromatic plants). Design of molecular markers with the aim of detecting and describing prominent specimens and their characteristics in order to improve the production of targeted products based on these specimens. Interrelation between biodivesity and bioactive molecules in plant systems, as well as methodology of varietal identification. Both basic and latest phenotyping and genotyping techniques Detection techniques of the role of genome and/or gene and their regulation in phenotype/genotype mapping. Transcriptomic, metabolomic and metagenomic techniques and their application. Most recent studies dealing with environmental influence on functional genome as well as the resulting changes in the functional genome, with special emphasis on autochthonous plants.		
Prerequisites	Finished course of Molecular biology.		
Course contents	Autochthounous plants genetics. Basic principles of population genetics. The genome influence of aucohthonous plants on thier morphological and biochemical characteristics. Plant DNA extraction methods. PCR methods. Methods of DNA and RNA analysis: genotyping applying different methods (RFLP, AFLP, STR, SNP); qPCR; genotyping of plastide DNA; cloning; sequencing; DNA/RNA hibridization; real-time qPCR; real-time PCR; DNA microarray technology; detection methods of epigenetic changes in DNA.		
Recommended reading	Khalid Meksem, Guenter Kahl, The Handbook of Plant Genome Mapping: Genetic and Physical Mapping, Wiley-VCH, 2005.; Teacher-generated materials.		
Supplementary reading			

Teaching methods	*Lectures:* Approach focused on student cooperation via reference to previously acquired knowledge. *Seminars:* discussion, seminar papers, students' reports.
Assessment methods	Assessment of student knowledge/performance is based on: seminar papers; reports; exam (written / oral).
Language of instruction	English / Croatian
Quality assurance methods	Quality assurance will be performed at three levels: (1) University Level, (2) Faculty Level by Quality Control Committee, (3) Lecturer's Level

NAME OF THE COURSE	Special Pharmacology I					
Code	KMF401	Year of study	4.			
Course teacher	Prof. dr. sc. Mladen Boban	Credits (ECTS)	4,5			
Associate teachers	Prof. dr. Darko Modun Doc. dr. Ivana Mudnić Grgo Gunjača, dr. med. Iva Jerčić, dr. med.	Type of instruction (number of hours)	L	S	E	T
			30	0	30	
Status of the course	Mandatory	Percentage of application of e-learning	0%			

COURSE DESCRIPTION

Course enrolment requirements and entry competences required for the course	Successful completion of the 3rd year of the Program.
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	1. List and name the most important drugs that represent individual pharmacotherapeutic class and group them according to the mechanism of action. 2. Describe and explain drug administration routes, main indications, contraindications and side effects of the drugs that are illustrative example of certain pharmacotherapeutic groups and subgroups. 3. Review significant drug interactions and relate them with the drugs pharmacokinetic and pharmacodynamic properties. 4. Utilize relevant national and international drug databases.
Course content broken down in detail by weekly class schedule (syllabus)	Drugs affecting cardiovascular system, central nervous system, kidney, drugs affecting specific chemical mediators and drugs affecting inflammation. Beside lectures and seminars, there are few laboratory exercises with experimental animals and computer simulations.
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)
Student responsibilities	In accordance to Rules of studying and Deontological code for USSM students.

Screening student work *(name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)*						
	Class attendance	1.5	Research		Practical training	
	Experimental work		Report		(Other)	
	Essay		Seminar essay		(Other)	
	Tests		Oral exam	1.5	(Other)	
	Written exam	1.5	Project		(Other)	

Grading and evaluating student work in class and at the final exam	The exam is composed of the written test and oral exam that equally contribute to the final mark.		
Required literature	**Title**	**Number of**	**Availability via**

		copies in the library	other media
(available in the library and via other media)	Katzung BG, Masters S, Trevor AJ, urednici. "Temeljna i klinička farmakologija", 1. hrvatsko izdanje, Zagreb, Medicinska naklada, 2011. (Basic and Clinical Pharmacology. 11thedition. New York: McGraw-Hill Medical; 2009.)		
	Bradamante V; Klarica M; Šalković-Petrišić M, urednici. "Farmakološki priručnik". Zagreb, Medicinska naklada, 2008.		
Optional literature (at the time of submission of study programme proposal)	- Trevor AJ, Katzung BG, Kruidering-Hall M, Masters SB, editors. Katzung & Trevor's Pharmacology Examination and Board Review.10th edition. New York: McGraw-Hill Medical; 2013 - Rang HP, Dale MM, Ritter JM, Moore PK, urednici. Farmakologija. 1. hrvatsko izdanje, Zagreb: Golden marketing i Tehnička knjiga; 2006.		
Quality assurance methods that ensure the acquisition of exit competences	▪ Teaching quality analysis by students and teachers ▪ Exam passing rate analysis ▪ Committee for control of teaching reports ▪ External evaluation		
Other (as the proposer wishes to add)			

NAME OF THE COURSE	Drug Biochemistry					
Code	KMF402	Year of study	4			
Course teacher	Prof. dr. sc. Marica Medić-Šarić	Credits (ECTS)	7,0			
Associate teachers	Ana Šešelja Perišin, mag. pharm	Type of instruction (number of hours)	L	S	E	T
			45	15	30	
Status of the course	Mandatory	Percentage of application of e-learning	0%			

COURSE DESCRIPTION

Course enrolment requirements and entry competences required for the course	Successful completion of the 3rd year of the Program.	
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	1. Select, name and describe the reactions of 1st and 2nd phase of drug metabolism 2. describe the ADME aparameters and their influence on drug metabolism 3. Decribe and explain the role of prodrugs 4. Predict and associate the drug chemical structure with the drug metabolic pathway 5. Predict possible drug toxicity	
Course content broken down in detail by weekly class schedule (syllabus)	Introduction to drug metabolism and biotransformations. Phase I reactions: bio-oxidations, bioreductions, hydrolysis, other reactions. Enzymes and enzyme systems (Peroxidases, Flavin Monooxygenases, CYP enzymes, Molbdenum Hydroxylases, Monoamine Oxidase, others). Phase II reactions: methylation, glucuronidation, acetylation, sulfation, amino acid conjugation, glutathione conjugation. Stereochemical aspects. Pro-drugs. Transport systems (P-glycoprotein, MRPs, BCRP, LRP, others (inhibition, induction, stimulation). Inhibition, induction, and stimulation of biotransformations. Drug-drug and drug-chemical interactions. Biotransformations and biological effects of endo- and xenobiotics. Use of intra- and interenet databases. QSAR and QSPR approaches and methods. Lipophilicity of Drugs	
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)
Student responsibilities	In accordance to Rules of studying and Deontological code for USSM students.	

Screening student work *(name the proportion of ECTS credits for each*						
	Class attendance	1	Research		Practical training	
	Experimental work	1	Report		(Other)	

activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Essay		Seminar essay		(Other)	
	Tests	1	Oral exam	2	(Other)	
	Written exam	2	Project		(Other)	
Grading and evaluating student work in class and at the final exam	The exam is composed of the written test and oral exam that equally contribute to the final mark.					
Required literature (available in the library and via other media)	**Title**				**Number of copies in the library**	**Availability via other media**
	Slobodan Rendić, Marica Medić-Šarić, *Metabolizam lijekova i odabranih ksenobiotika*, ur. M. Medić-Šarić, Medicinska naklada Zagreb 2013. (Sveučilišni udžbenik)					
	Marica Medić-Šarić, *Vježbe iz Biokemije lijekova*, Farmaceutsko-biokemijski fakultet Sveučilišta u Zagrebu, Zagreb 2008. (Interna skripta)					
Optional literature (at the time of submission of study programme proposal)	Testa B., Krämer S.D. *The Biochemistry of Drug Metabolism: Volume 1: Principles, Redox Reactions, Hydrolyses*, Wiley-VCH, Verlag GmbH, Weinheim 2008. Testa B., Krämer S.D. *The Biochemistry of Drug Metabolism*: *Volume 2*: *Conjugations, Consequences of Metabolism*, *Influencing* *Factors*, Wiley-VCH, Verlag GmbH, Weinheim 2010.					
Quality assurance methods that ensure the acquisition of exit competences	▪ Teaching quality analysis by students and teachers ▪ Exam passing rate analysis ▪ Committee for control of teaching reports ▪ External evaluation					
Other (as the proposer wishes to add)						

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="6">Extemporaneous preparations</td></tr>
<tr><td>Code</td><td>KMF403</td><td>Year of study</td><td colspan="5">4</td></tr>
<tr><td>Course teacher</td><td>Prof.dr.sc. Mira Bečirević Laćan</td><td>Credits (ECTS)</td><td colspan="5">3,0</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Mr.sc.Ina Topić,mag.pharm.</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>T</td></tr>
<tr><td>15</td><td>15</td><td>15</td><td></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="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">Successful completion of the 3rd year of the Program.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">Describe and explain the principles of preparation of extemporaneous medications.

Successfully and independently prepare the extemporaneous medications.

Apply the necessary pharmaceutical calculations of the dose of active compound, required for different types of the extemporaneous medications.

Independently apply knowledge about drug stability, shelf life and expiration date.</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="6">Principles of individual preparation of medications for specific users according to a unit physician’s prescriptions. Apothecary table. Recipe. Legal issues. Dosology: treatment dose, full dose, individual maximal dose, children’s doses, toxic and lethal dose; dose control. The production of non-sterile preparations in pharmacies: rooms and equipment; components; storing; personnel. Production of ophthalmic extemporaneous products. Intolerability of preparations during their production (physical, chemical, physiological). Sterilization. Microbiological quality of raw materials and preparations. Selection and source of ingredients. Identification of ingredients. Pharmaceutical calculation. Medicinal preparations for internal use, preparations for inhalation, medicinal forms intended for administration into bodily cavities, oral medicinal forms, forms of medicinal drugs. The timing of administration. Stability, shelf life and expiration date. Seminar: Pharmacography: general guidelines for drug prescriptions; medications that are issued on prescription; parts and the form of the recipe; writing a recipe; acronyms and numbers. Quantities of the medication. Practical measurements for medications. Producing small series. Packaging, labelling and issuing. Documentation and record keeping. Practicals: preparation of prescribed extemporaneous medications.</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒ lectures
☒ seminars and workshops
☒ exercises
☐ on line in entirety
☐ partial e-learning</td><td colspan="3">☐ independent assignments
☐ multimedia
☒ laboratory
☐ work with mentor
☐ (other)</td></tr>
</table>

<table>
<tr><td></td><td colspan="6">☐ field work</td><td colspan="2"></td></tr>
<tr><td>Student responsibilities</td><td colspan="8">In accordance to Rules of studying and Deontological code for USSM students.</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</td><td>Research</td><td></td><td>Practical training</td><td colspan="2"></td></tr>
<tr><td>Experimental work</td><td>1</td><td>Report</td><td></td><td>(Other)</td><td colspan="2"></td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>(Other)</td><td colspan="2"></td></tr>
<tr><td>Tests</td><td></td><td>Oral exam</td><td></td><td>(Other)</td><td colspan="2"></td></tr>
<tr><td>Written exam</td><td>1</td><td>Project</td><td></td><td>(Other)</td><td colspan="2"></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="8">Final written test.</td></tr>
<tr><td rowspan="5">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">M. Bećirević, M.Jug, Magistralna receptura (praktikum) Zagreb, 2008 (vlastita naklada)</td><td></td><td></td></tr>
<tr><td colspan="5">Formulae magistrales Croaticae, HLJK, Zagreb, 2011</td><td></td><td></td></tr>
<tr><td colspan="5">Priručnici za rad u ljekarni</td><td></td><td></td></tr>
<tr><td colspan="5">M. Bećirević, R.Senjković, Oblikovanje lijekova (praktikum), Liber, Zagreb, 1997</td><td></td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="8">R. K. Jew, R. J. Mullen, W. Soo-Hoo, Magistralni pripravci, Hrvatsko Farmaceutsko društvo, Zagreb, 2008.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="8">▪ Teaching quality analysis by students and teachers
▪ Exam passing rate analysis
▪ Committee for control of teaching reports
▪ External evaluation</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="8"></td></tr>
</table>

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="6">Technology of Synthetic Drugs</td></tr>
<tr><td>Code</td><td>KMF404</td><td>Year of study</td><td colspan="5">4th</td></tr>
<tr><td>Course teacher</td><td>Branka Andričić</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 colspan="2">F</td></tr>
<tr><td>45</td><td></td><td>30</td><td colspan="2"></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 enrolment requirements and entry competences required for the course</td><td colspan="7">Successful completion of the 3rd year of the Program.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="7">- meeting the elements of quality assurance
- application and following the rules of GMP
- understanding the importance of scale up
- definition of basic steps in industrial API production
- recognize the importance of catalytic over non-catalytic API synthesis
- distinguish batch and continuous processes</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="7">History and development of pharmaceutical industry. Drug development phases. Process scale up. (3 hours)
Scale up criteria (reagents, solvents, unit operations, complexity of reaction). (3 hours)
Quality assurance elements in drug production. (1 hour)
Good manufacturing practice. Sterile drugs production (clean rooms, equipment, sterilization methods of air and products). (3 hours)
The role of synthetic chemistry in the drug discovery. Raw materials for drugs synthesis. Route design and process optimization. (2 hours)
“Green” chemistry principles. Examples of ibuprofen synthesis. Solvent recovery. (2 hours)
Routes toward total synthesis (oseltamivir, paclitaxel, discodermolide). (1 sat)
Overall technological process with production schemes. (1 sat)
Chemical reactors characteristics. Principles of separation, crystallization, purification and drying. Flow chart of drug formulation. (3 hours)
An overview of the lectures. (1 hour)
First test (1 hour)
Importance of catalysts in drugs production. (1 hour)
ASA production – catalytic and non-catalytic route. Reaction by-products and its use. Diazepam production – three different ways of synthesis. (3 hours)
Amlodipine production (Pfizer)- catalytic and non-catalytic process. (1 sat)
Chloramphenicol production.– the importance of catalysts. Levetiracetam production – classical and novel synthesis. (3hours)
Importance of continuous vs. batch processes. Celecoxib production – batch and continuous process. (2 hours)
Levofloxacine production – an example of asymmetric synthesis. Azithromicyn production by chemical modification of erithromicyn. (3 hours)
Lidocaine production. Methformin production Amphetamine production – reductive amination, nitroalkane addition and nitro group reduction, Leukart synthesis, chiral synthesis. (3 hours)</td></tr>
</table>

<table>
<tr><td></td><td colspan="6">Exemestane production (Pfizer). Radafaxine production – racemate separation using chiral chromatography. An example of drug formulation (paracetamol). (3 hours)
An overview of the lectures.(1 hour)
Second test (1 hour).
Laboratory exercises:
API synthesis. Recrystallization. Drying. API identification using FT-IR. Purity determination using DSC.
Visit to pharmaceutical company (Pliva, Teva group).</td></tr>
<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
X laboratory
☐ work with mentor
☐ (other)</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>1.5</td><td>Research</td><td></td><td>Practical training (report on exp. work)</td><td>0.2</td></tr>
<tr><td>Experimental work</td><td>0.5</td><td>Report</td><td></td><td>Tests before experimental work</td><td>0.2</td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>Field work</td><td>0.6</td></tr>
<tr><td>Tests</td><td>1.0</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 colspan="6"></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 35%. In the final grade laboratory exercises has fraction of 30%.In the exam period the student has to attend to written and oral exam (passing score is 60%). Written exam is 35% and oral exam is 35%.
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. D. S. Johnson, J. J. Li, The art of drug synthesis, Wiley Interscience, New York, 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">R. Vardanyan, V. Hruby, Synthesis of essential drugs, Elsevier, New York, 2006.
M. Jovanović, Z. Đurić, Osnovi industrijske farmacije, Nijansa, Zemun, 2005</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>

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="6">Pharmaceutical Legislation</td></tr>
<tr><td>Code</td><td>KMF405</td><td>Year of study</td><td colspan="4">4.</td></tr>
<tr><td>Course teacher</td><td>prof.dr.sc. Siniša Tomić</td><td>Credits (ECTS)</td><td colspan="4">2.5</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>T</td></tr>
<tr><td>30</td><td>0</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">0%</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">Successful completion of the 3rd year of the Program.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">Describe and explain the principles of pharmaceutical legislation in Croatia and EU

Distinguish the part of pharmaceutical legislation that is harmonized on the EU level from the part that is regulated on a national level

List and desribe the processes od drug licence approvement in EU and Croatia

List and describe the processes of reviewing the drug documentation

List and describe different drug information

Describe and classify medicinal products

Describe and explain the legislation of food supplement products

Describe and explain the role of the Croatian Pharmaceutical Chamber</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="6">*Ignorantia iuris nocet*. The protection of health and life. Legal responsibility of pharmacists, unconsciencious behaviour, felonies and abuse of narcotics. The law on drugs, The law on medical products, medications that may be acquired without prescription and other means of health protection. Drug assessment, presumptions. Proof, apodictic proof, indirect proof, burden of proof, necessary measure of proof, threshold of proof and standard of proof. The power of the analytical procedure, certitude and probability. *Non omne licitum est honestum*. Research ethics, clinical trial, ethical committees and good clinical practice. Production licence, *evidentia rei*, trade in human and veterinary drugs and medical products. Supply of drugs and wholesale. Methods of prescription, production and issue of medications. Narcotics and psychotropic substances. Controlled substances, maximal dose, toxic and lethal dose. Side-effects follow-up. The position of a new drug, decisions on the validity and harmfulness, quality assessment and pharmacopeia. Placement of a drug on the market. Croatian pharmacopeia as a sub-legal act.</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒ lectures
☐ seminars and workshops
☐exercises
☐ *on line* in entirety</td><td colspan="3">☐ independent assignments
☐ multimedia
☐ laboratory
☐ work with mentor</td></tr>
</table>

	☒ partial e-learning ☐ field work		☐ (other)			
Student responsibilities	In accordance to Rules of studying and Deontological code for USSM students.					
Screening student work *(name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)*	Class attendance	0.5	Research		Practical training	
	Experimental work		Report		Homework	0.5
	Essay	0.5	Seminar essay		(Other)	
	Tests		Oral exam		(Other)	
	Written exam	1	Project		(Other)	
Grading and evaluating student work in class and at the final exam	Final written test.					

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Zakon o lijekovima		Yes
	Pravilnik o farmakovigilanciji		Yes
	Zakon o medicinskim proizvodima		Yes
	Zakon o ljekarništvu		Yes
	Zakon o zdravstvenoj zaštiti		Yes
	Zakon o sanitarnoj inspekciji		Yes
	Zakon o suzbijanju zlouporabe opojnih droga		Yes
	Zakon o hrani		Yes

Optional literature (at the time of submission of study programme proposal)	
Quality assurance methods that ensure the acquisition of exit competences	▪ Teaching quality analysis by students and teachers ▪ Exam passing rate analysis ▪ Committee for control of teaching reports ▪ External evaluation
Other (as the proposer wishes to add)	

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="6">Pharmaceutical Formulations</td></tr>
<tr><td>Code</td><td>KM 406</td><td>Year of study</td><td colspan="5">4</td></tr>
<tr><td>Course teacher</td><td>Prof.dr.sc. Mira Bečirević Laćan</td><td>Credits (ECTS)</td><td colspan="5">4,0</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Mr.sc.Ina Topić,mag.pharm.</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>T</td></tr>
<tr><td>30</td><td>15</td><td>15</td><td></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="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">Successful completion of the 3rd year of the Program.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">1. Describe and explain the general and specific properties of specific drug formulations

2. List and define auxiliary substances used for different drug formulations

3. Describe and explain the technological processes of manufacturing different drug formulations

4.List and explain the required quality standard for specific drug formulations</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="6">Drugs forms. Pharmaceutical dosage forms as systems for drug application: digestive system and metabolism (A), preparations with effect on skin (D), system of reproductive and urinary organs (G), respiratory system (R), senses (S). Auxiliary substances: fillers, lubricants, solubilisators, thickeners, emulsifiers, substances for dissolving, improvement of dissolving, isotonisation, bounding, decomposition, taste improvement, basis for unguents and suppositories. E-numbers. Possible sources of side effects of auxiliary substances. Classification of pharmaceutical dosage forms: liqiud, semi-solid, solid. Capsules: hard, soft, acidoresistant, starch capsule. Medicated chewing gums. Ear preparations: drops and spray, semi-solid preparations, powders, ear wash, tampons. Eye preparations: drops and sprays, powders for drops and lotions, semi-solids, inserts for eyes. Medicated foams. Granules: effervescent, coated, with modificated release, acidoresistant. Liqiud cutaneous preparations: shampoos, foams. Liquid oral preparations: powders and granules for solutions and suspensions, drops, powders for drops, syrups, powders and granules for syrups. Nasal preparations: drops and liquid sprays, powders, semi-solid, nasal wash, nasal sticks. Parenteral preparations: injections, infusions, powders for injections and infusions, implants. Transdermal patch. Powders for cutaneous and peroral application. Preparations for inhalation: liquid, powders. Preparations for rinsing. Aerosol preparations. Rectal preparations: suppositories,</td></tr>
</table>

<table>
<tr><td></td><td colspan="6">capsules, solutions and suspensions, powders and tablets for rectal solutions and suspensions, semi-rigid, foams, tampons. Semi-solid preparations for local applications: unguents, ointments, gels, pastes, poultices, plasters. Sticks. Tablets: uncoated, coated, effervescent, soluble, dispersible, with modificated release, acidoresistant, oromucosal. Vaginal preparations: pessaries, tablets, capsules, solutions, emulsions and suspensions, foams, tampons. Sterility, sterilization and preservatives. Production and pharmaceutically-technical procedures for assessment of particular preparations.</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>Student responsibilities</td><td colspan="6">In accordance to Rules of studying and Deontological code for USSM students.</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>1.5</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></td><td>Oral exam</td><td>1.5</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></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">Written and oral exam.</td></tr>
<tr><td rowspan="8">Required literature (available in the library and via other media)</td><td colspan="4">Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td colspan="4">R. Senjković, Osnove oblikovanja lijekova, Školska knjiga, Zagreb, 2003.</td><td></td><td></td></tr>
<tr><td colspan="4">M. Bećirević, M.Jug, Oblikovanje lijekova (praktikum), Zagreb,2007. (vlastita naklada)</td><td></td><td></td></tr>
<tr><td colspan="4">H.C. Ansel, L.V. Allen,, N.G. Popovich, Pharmaceutical dosage forms and drug delivery systems, Lippincott Williams and Wilkins, 7th Ed., 1999.</td><td></td><td></td></tr>
<tr><td colspan="4">Hand-outs</td><td></td><td></td></tr>
<tr><td colspan="4"></td><td></td><td></td></tr>
<tr><td colspan="4"></td><td></td><td></td></tr>
<tr><td colspan="4"></td><td></td><td></td></tr>
</table>

Optional literature (at the time of submission of study programme proposal)	A. H. Kibbe (ed), Handbook of Pharmaceutical Excipients, Third Edition, American Pharmaceutical Association, Washington, 2000;		
Quality assurance methods that ensure the acquisition of exit competences	▪ Teaching quality analysis by students and teachers ▪ Exam passing rate analysis ▪ Committee for control of teaching reports ▪ External evaluation		
Other (as the proposer wishes to add)			

NAME OF THE COURSE	Special Pharmacology II					
Code	KMF407	Year of study	4.			
Course teacher	Prof. dr. Darko Modun	Credits (ECTS)	4,0			
Associate teachers	Prof. dr. sc. Mladen Boban Doc. dr. Ivana Mudnić Iva Jerčić, dr. med.	Type of instruction (number of hours)	L	S	E	T
			30	15	0	0
Status of the course	Mandatory	Percentage of application of e-learning	0%			

COURSE DESCRIPTION

Course enrolment requirements and entry competences required for the course	Successful completion of the 3rd year of the Program.
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	1. List and name the most important drugs that represent individual pharmacotherapeutic class and group them according to the mechanism of action. 2. Describe and explain drug administration routes, main indications, contraindications and side effects of the drugs that are illustrative example of certain pharmacotherapeutic groups and subgroups. 3. Review significant drug interactions and relate them with the drugs pharmacokinetic and pharmacodynamic properties. 4. Utilize relevant national and international drug databases.
Course content broken down in detail by weekly class schedule (syllabus)	Drugs affecting gastrointestinal tract, respiratory system, endocrine glands, haematostasis and haematopoietic system, antibiotics, cancer chemotherapy.
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)
Student responsibilities	In accordance to Rules of studying and Deontological code for USSM students.

Screening student work *(name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)*						
	Class attendance	1	Research		Practical training	
	Experimental work		Report		(Other)	
	Essay		Seminar essay		(Other)	
	Tests		Oral exam	1.5	(Other)	
	Written exam	1.5	Project		(Other)	

Grading and evaluating student work in class and at the final exam	The exam is composed of the written test and oral exam that equally contribute to the final mark.

Required literature (available in the	**Title**	**Number of copies in**	**Availability via other media**

library and via other media)		**the library**	
	Katzung BG, Masters S, Trevor AJ, urednici. "Temeljna i klinička farmakologija", 1. hrvatsko izdanje, Zagreb, Medicinska naklada, 2011. (Basic and Clinical Pharmacology. 11thedition. New York: McGraw-Hill Medical; 2009.)		
Optional literature (at the time of submission of study programme proposal)	- Trevor AJ, Katzung BG, Kruidering-Hall M, Masters SB, editors. Katzung & Trevor's Pharmacology Examination and Board Review.10th edition. New York: McGraw-Hill Medical; 2013 - Rang HP, Dale MM, Ritter JM, Moore PK, urednici. Farmakologija. 1. hrvatsko izdanje, Zagreb: Golden marketing i Tehnička knjiga; 2006.		
Quality assurance methods that ensure the acquisition of exit competences	▪ Teaching quality analysis by students and teachers ▪ Exam passing rate analysis ▪ Committee for control of teaching reports ▪ External evaluation		
Other (as the proposer wishes to add)			

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="6">Biotechnological Processes in Pharmaceutical Industry</td></tr>
<tr><td>Code</td><td>KMF408</td><td>Year of study</td><td colspan="5">4th</td></tr>
<tr><td>Course teacher</td><td>Branka Andričić</td><td>Credits (ECTS)</td><td colspan="5">4.5</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></td><td>30</td><td></td></tr>
<tr><td>Status of the course</td><td>Obligatory</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">Gaining of basic theoretical knowledge in biotechnology as well as the role and application of microorganisms and enzymes in industry related to pharmacy.</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">- 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 the techniques of cell disruption to obtain intracellular products
- explain the alcoholic fermentation
- outline some examples of biotechnological processes (synthesis of antibiotics and vitamins as well as the anti cancer drugs)</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="5">Description and overview of the course. Definitions of biotechnology, interdisciplinary of the field, history development, application areas. Metabolism and control of metabolic processes; primary and secondary metabolism. (2 hours)
Anaerobic and aerobic metabolism. Basic scheme of biotechnological process. Substrate characteristics and preparation. (2 hours)
Bioreactors, photo-bioreactors, design. Oxygen role in bioprocesses. Sterilization. Classification of bioprocesses. (2 hours)
Microbial technology. Microorganisms in biotechnology (bacterial, fungi (yeasts and moulds). Enzyme technology (enzyme characteristics as the biocatalysts, advantages and disadvantages compared to whole cells). (2 hours)
Enzyme sources. Selection, production and immobilization of enzymes. Plant and animal cells culture. (2 hours)
Microbial growth kinetics. Determination of specific growth rate and Monod constant. Enzyme kinetics. (2 hours)
Enzymes and cells immobilization. Examples of the processes with immobilized enzymes. An overview of the previous lecture for the test. (2 hours)
First test. (1 hour)
Extracellular, periplasmic and extracellular products of metabolism. Down-stream processing: separation solid-liquid, isolation of intracellular products. Biosensors. (2 hours)
An overview of biotechnological processes. Yeasts and alcoholic fermentation. Lactic acid fermentation and lactic acid production. (2 hours)
Citric acid production. Synthesis of nisin and amino acids. Synthesis of antibiotics. (2 hours)
Single cell proteins. Production of vitamin B_{12}. (2 hours)</td></tr>
</table>

<table>
<tr><td></td><td colspan="6">Biotechnological production of beta carotene and astaxanthin. Taxol production with plant cell culture. (2 hours)
New biotechnology (discoveries, risks). Recombinant proteins of high value. Therapeutic proteins (insulin, interferon, G-CFS, monoclonal antibodies). An overview of the previous lecture for the test. (4 hours)
Second test. (1 hour)

Laboratory exercises:
1. Fermentation of Saccharomyces Cerevisiae
2. Immobilization of baker's yeast on alginate
3. Immobilization of lactase on alginate
4. DNA extraction from plant and animal tissue</td></tr>
<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
X laboratory
☐ work with mentor
☐ (other)</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></td><td>Practical training (report on exp. work)</td><td>0.2</td></tr>
<tr><td>Experimental work</td><td>1.0</td><td>Report</td><td></td><td>Tests before experimental work</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>0.8</td><td>Oral exam</td><td>0.6</td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td>0.7</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 complete exam can be passed through two tests during semester. The passing score is 60 % and the fraction of each test is 35%. In the final grade laboratory exercises has fraction of 30%.In the exam period the student has to attend to written and oral exam (passing score is 60%). Written exam is 35% and oral exam is 35%.
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">1. 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</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>
</table>

competences	
Other (as the proposer wishes to add)	

NAME OF THE COURSE	Pharmaceutical Toxicology					
Code	KMF409	Year of study	4.			
Course teacher	Prof. dr. Davorka Sutlović,	Credits (ECTS)	4,5			
Associate teachers	Angela Stipišić, dipl.ing. kem. Zlatka Knezović, dipl.ing. kem. Maja Veršić, dipl.ing kem.	Type of instruction (number of hours)	L	S	E	T
			30	15	15	
Status of the course	Mandatory	Percentage of application of e-learning	0%			

COURSE DESCRIPTION

Course enrolment requirements and entry competences required for the course	Successful completion of the 3rd year of the Program.
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	1. Decribe the basic terms from toxicology 2. Differentiate between skin, respiratory system and digestive system as the entrance route for toxins. 3. Recognize group of toxic products that could be dangerous to human health 4. Select the appropriate method and analytical technique for determination of toxins in biological samples 5. Interprete the toxicological report
Course content broken down in detail by weekly class schedule (syllabus)	Principles of toxicology – introduction, dose-response, hazard and risk. Routes of exposure and absorption, metabolism, distribution and excretion. Regulatory toxicology. Toxic agents: gas agents, industrial organic compounds, inorganic compounds, drags and drags abuse, pesticides, animal and plant toxins. Toxicological samples: human, biological and other samples. Extraction of target compounds from different samples- isolation and identification. Solid phase extraction and liquid – liquid extraction methods. Toxicological analysis. Chemical hazards with acute and chronic exposure. Military toxicology.
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)
Student responsibilities	In accordance to Rules of studying and Deontological code for USSM students.

Screening student work *(name the proportion of ECTS credits for each activity so that the total number of*						
	Class attendance	0.5	Research		Practical training	
	Experimental work	0.5	Report		(Other)	
	Essay		Seminar	0.5	(Other)	

ECTS credits is equal to the ECTS value of the course)			essay			
	Tests	1.0	Oral exam	1.0	(Other)	
	Written exam	1.0	Project		(Other)	
Grading and evaluating student work in class and at the final exam	Written and oral exam.					

	Title	Number of copies in the library	Availability via other media
Required literature (available in the library and via other media)	1. Sutlović D, i sur. Osnove forenzične toksikologije		
	2. Plavšić F, Žuntar I. Uvod u analitičku toksikologiju		
	3. Z. Duraković i sur. Klinička toksikologija, Zagreb, Grafos, 2000.		

Optional literature (at the time of submission of study programme proposal)	1. Plavšić F, Wolf-Čoporda A, Lovrić Z, Čepelak D. Siguran rad s kemikalijama. 2. Sutlović D, i sur. Toksikologija hrane. 3. A. C. Moffat, M. D. Osselton, B. Widdop, Clarke's Analysis of Drugs and Poisons, 3rd ed. London: Pharmaceutical Press, 2004.; F. P. Smith, Handbook of Forensic drug Analysis. Elseiver Academic Press, 2005.; P. Gerhards, U. Bons, J. Sawazki, J. Szigan, A. Wertmann, GC/MS in Clinical Chemistry. WILEY-VCH Verlag GmbH. Weinheim; 1999.
Quality assurance methods that ensure the acquisition of exit competences	▪ Teaching quality analysis by students and teachers ▪ Exam passing rate analysis ▪ Committee for control of teaching reports ▪ External evaluation
Other (as the proposer wishes to add)	

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">Immunology and Vaccines</td></tr>
<tr><td>Code</td><td>KMF410</td><td>Year of study</td><td colspan="4">4</td></tr>
<tr><td>Course teacher</td><td>Prof. dr. Janoš Terzić</td><td>Credits (ECTS)</td><td colspan="4">4,5</td></tr>
<tr><td>Associate teachers</td><td>Prof. dr. Ivana Marinović Terzić
Doc. dr. Ivana Novak Nakir
Dr. sc. Jelena Korać Prlić
Dr. sc. Boris Mihaljević
Mr. sc. Mija Marinković
Marina Degoricija, dipl. ing.</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>T</td></tr>
<tr><td></td><td></td><td>30</td><td>15</td><td>15</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">0%</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">Passed exams from the 3rd year of the Program.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">Explain how innate and adaptive immunity function and integrate their join functioning in the defense of human organism. Correctly usage of immunologic terminology. Name immune cells and antibody classes; describe their action mechanism. Explain antibody and T cell receptor diversity. Describe the most important cytokines and their main functions. Differentiate main immune disorders (hypersensitivity, autoimmunity and immunodeficiency) and explain mechanism of their development. Explain functional roles of MHC molecules. Critically evaluate blood leukocytes count. List examples of research techniques used to analyze proteins and immune cells. Differentiate main types of vaccines. Name the basic vaccines and explain their properties..</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="6"><u>Basic immunology</u> will cover: innate immunity; immune cells and organs; production, function and effector mechanisms of antibodies and antigenic lymphocyte receptor (TLR); as well as maturation and activation of T cells and B cells. Tolerance of self-antigens, major histocompatibility complex, antigen presentation and cytokines will be covered.

<u>Clinical immunology</u> will cover: immunity to microbes, tumor cells and transplants; autoimmunity, hypersensitivity and immunodeficiency. Clinical cases involving important immunological aspects of immune system will be introduced into the course.

<u>Laboratory immunology</u> will cover: Laboratory practical will be organized in a way that emphasizes basic immunology principals. Practical exercises will include: immunoblot, IP, immuno-histochemistry, ELISA assay and flow cytometry.</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>
</table>

<table>
<tr><td>Student responsibilities</td><td colspan="6">In accordance to Rules of studying and Deontological code for USSM students.</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></td><td>Practical training</td><td>0.5</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>1.0</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>1.5</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">Written examination at the end of the course.</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. Imunologija. Andreis I. i sur. 7. izd. Zagreb: Medicinska naklada; 2010.</td><td>20</td><td colspan="2"></td></tr>
<tr><td colspan="3">2. Epidemiology and Prevention of Vaccine-Preventable Diseases. The Pink Book: Course Textbook. 12. izd. Altlanta: CDC; 2012.</td><td></td><td colspan="2">Yes</td></tr>
<tr><td colspan="3">Materijali s vježbi i studentski referati</td><td></td><td colspan="2">Yes</td></tr>
<tr><td colspan="3"></td><td></td><td colspan="2"></td></tr>
<tr><td>Optional literature (at the time of submission of study program proposal)</td><td colspan="6"></td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="6">▪ Teaching quality analysis by students and teachers
▪ Exam passing rate analysis
▪ Committee for control of teaching reports
▪ External evaluation</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="6"></td></tr>
</table>

NAME OF THE COURSE	Pharmaceutical Quality Control				
Code	KMF411	Year of study	4		
Course teacher	prof. dr sc. Miroslav Šober	Credits (ECTS)	4,5		
Associate teachers		Type of instruction (number of hours)	L	S	E	T
			30	15	0	0
Status of the course	Mandatory	Percentage of application of e-learning	0%			

COURSE DESCRIPTION

Course enrolment requirements and entry competences required for the course	Passed exams from the 3rd year of the Program.
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	1. Describe and explain the terms of quality and pharmaceutical quality, and classify the quality control systems: GMP, GcLP, 6 Sigma, HCCP. 2. List and explain the elements for quality assurance in accordance to the norms ISO 9000, ISO 17025 and GMP – compare therse systems in relation to pharmaceutical quality control 3. Decribe and explain the basic documentation of a system for quality control and pharmaceutical quality control: Quality manual, SOP, Site Master File 4. Create a (part of a) document for the a system for pharmaceutical quality control 5. Decribe and explain the ICH guidelines, Q series – relating quality 6. Apply the ICH Q2(R1) on a validation of an analytical method 7. Decribe and explain the System suitability test, in relation to USP and PhEur
Course content broken down in detail by weekly class schedule (syllabus)	Quality and pharmaceutical quality. Quality control systems. Quality manual, SOP, Site Master File. ICH guidelines. Validation of an analytical method. System suitability test, USP and PhEur.
Format of instruction	☒ lectures ☒ seminars and workshops ☐ exercises ☐ *on line* in entirety ☐ partial e-learning ☐ field work ☐ independent assignments ☐ multimedia ☐ laboratory ☐ work with mentor ☒ consultations
Student responsibilities	In accordance to Rules of studying and Deontological code for USSM students.

Screening student work *(name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)*						
	Class attendance		Research		Practical training	
	Experimental work		Report		(Other)	
	Essay		Seminar essay	1.0	Activitiy during lectures	0.4
	Tests		Oral exam		(Other)	
	Written exam	3.1	Project		(Other)	

<table>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="3">Final written exam.</td></tr>
<tr><td rowspan="4">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>Hand-outs</td><td></td><td></td></tr>
<tr><td>ICH Quality guideliens</td><td></td><td>Yes</td></tr>
<tr><td>EudraLex The Rules Governing Medicinal Products in the European Union Volume 4

Good Manufacturing Practice</td><td></td><td>Yes</td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="3">1. 1 Kenkel J. A Primer of Quality in teh Analytical Laboratory. CRC Press LLC 2000
2. Ermer J, Miller JJH eds. Method Validation in Pharmaceutical Analysis: A Guide to Best Practice. Wiley, New York, 2005
3. Swartz ME, Krull IS. Handbook of Analytical Validation. Taylor and Francis Group LLC 2012
Wenclaviak BW, Koch M, Hadjicostas E eds. Quality Assuranc in Analytical Chemistry – Training and Teaching, second edition. Springer 2010</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="3">▪ Teaching quality analysis by students and teachers
▪ Exam passing rate analysis
▪ Committee for control of teaching reports
▪ External evaluation</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="3"></td></tr>
</table>

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="6">Scientific Methodology in Pharmacy</td></tr>
<tr><td>Code</td><td>KMF412</td><td>Year of study</td><td colspan="5">4.</td></tr>
<tr><td>Course teacher</td><td>Prof. dr. Matko Marušić</td><td>Credits (ECTS)</td><td colspan="5">4</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Mario Malički, dr. med.</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>T</td></tr>
<tr><td>15</td><td>15</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="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">Passed exams from the 3rd year of the Program.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">Understand the origin and mechanisms of acquisition of genuine knowledge;

Learn types of clinical studies and phases of clinical trials;

Understand the principles of research of new pharmaceutical compounds in humans;

Articulate the advantages and disadvantages of various clinical study designs in testing pharmaceutical compounds;

Critically assess data presentation and analysis in articles presenting pharmacological research;

Understand rules and acquire basics of transfer of scientific information (scientific publishing);

Learn about responsible conduct of research and public access to information about clinical trials.</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="6">*Lectures*:

Science, knowledge, and research. Types of clinical studies, phases of clinical trials. Scientific information and communication – publishing, journals, articles. Pharmacoepidemiology, pharmacovigilance, and drug safety. Research and publication ethics, legal regulation of clinical trials (Bill on drugs, Guidelines for clinical trials and good clinical practice, Guidelines on adverse effects of drugs and medical products).

Seminars:

Formulation of hypothesis of own research. Planning of own research. Reporting research results (abstract, IMRaD, references). ICH Guidelines for good clinical practice.</td></tr>
</table>

	Practicals: Presentation of research data. Critical analysis of a research report. CONSORT statement. STROBE and STARD statements.
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)
Student responsibilities	In accordance to Rules of studying and Deontological code for USSM students.

Screening student work *(name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)*						
	Class attendance		Research		Practical training	
	Experimental work		Report	1.6	(Other)	
	Essay		Seminar essay		(Other)	
	Tests		Oral exam		(Other)	
	Written exam	2.4	Project		(Other)	

Grading and evaluating student work in class and at the final exam	Final written test.

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Marušić M, urednik. Uvod u znanstveni rad u medicini. 5. izd. Zagreb: Medicinska naklada; 2013.	20	
	Ferenczi E, Muirhead N. Statistika i epidemiologija u jednom potezu. Zagreb: Medicinska naklada; 2011.	20	
	Hand-outs.	-	Yes

Optional literature (at the time of submission of study programme proposal)	Canadian Institute for Health Information. "HL7 Canada." CIHI Home Page. http://www.cihi.ca.; Duke UniversityHealth System. "Health Level-7 Stantdards Page." MCIS: Medical Center Information Systems. http://www.mcis.duke.edu/standards/HL7/pubs/version2.3/html/httoc.htm
Quality assurance methods that ensure the acquisition of exit competences	▪ Teaching quality analysis by students and teachers ▪ Exam passing rate analysis ▪ Committee for control of teaching reports ▪ External evaluation
Other (as the proposer wishes to add)	

Course title	Mechanisms of cancerogenesis		
Course code	KMFI18		
Type of course	Lectures, seminars, exercises (30+0+0)		
Level of course	Basic		
Year of study	4th year	**Semester:**	VII. or VIII.
ECTS (Number of credits allocated)	3.0		
Name of lecturer	Dr. Merica Glavina Durdov, associate professor, Dr. Snježana Tomić, full professor,		
Learning outcomes and competences	During this course students will learn about chemical carcinogens, radiation carcinogenesis and viral and microbial oncogenesis. They will learn about essential genetic alterations included in malignant transformation of cells and tumor progression.		
Prerequisites	Passed exams from previous year of study.		
Course contents	Characteristics of benign and malignant neoplasms. Epidemiology. Etiology of the cancer: cancerogenic agens. Changes in cell phisiology that determine malignant phenotype. Disturbances in cell cycle regulation: activation of protoncogenes, inactivation of tumor supressor genes. Mutations in the genes that regulate apoptosis. DNA repair defects and genomic instability in cancer cells. Role of the telomerase activity in cancerogenesis. Molecular basis of angiogenesis, invasion and metastasis. Dysregulation of cancer associated genes: chromosomal changes, gene amplification, epigenetic changes, molecular profiles of cancer cells. Molecular basis of multistep carcinogenesis.		
Recommended reading	Kumar V., Neoplasia. In Robbins and Cotran Pathologic Basis of the Disease, 7th edition, Kumar V, Abbas A, Fausto N (Ed.), Elsevier Saunders, Philadelphia, USA, 2005.		
Supplementary reading	Jaffer FA, Weissleder R., Molecular imaging in the clinical arena, JAMA, 2005, 293(7):855-62; Hiyama E, Hyama K., Telomerase as tumour marker, Cancer Lett., 2003, 194:221-225; Bergers G, Benjamin LE., Angiogenesis: tumorigenesis and the angiogenic switch, Nat Rev Cancer 2003, 3: 401-415; Kim WJ, Quan C., Genetic and epigenetic aspects of bladder cancer, J Cell Biochem., 2005, 9: 212-35		
Teaching methods	Lectures.		

Assessment methods	Writen exam.
Language of instruction	Croatian (optional – English)
Quality assurance methods	Quality assurance will be performed at three levels: (1) University Level, (2) Faculty Level by Quality Control Committee, (3) Lecturer's Level

Course title	Economic principles of pharmaceutical industry		
Course code	KMFI19		
Type of course	Lectures, seminars, exercises (30+0+0)		
Level of course	Basic level course		
Year of study	4th year	**Semester**	VII. or VIII.
ECTS (Number of credits allocated)	3.0		
Name of lecturers	Dr. Ivan Pavić, full professor, Dr. Maja Pervan, assistant professor		
Learning outcomes and competences	Qualifications for analyzing and understanding the global environment and development trends in the pharmaceutical industry. Understanding the way the pharmaceutical industry is organized and how it functions. Adoption of the basic terms and concepts related to the pharmaceutical industry. Competence to identify and analyze the influence of changes in supply/demand and production/cost to the business of pharmaceutical companies.		
Prerequisites	-		
Course contents	Pharmaceutical industry: the global environment and trends, drugs in the world, characteristics of the pharmaceutical industry, the share in GDP, the organizational structure of the market (oligopoly vs. industry with the dominant company). Companies in the pharmaceutical industry: the world market leaders, the pharmaceutical companies in Croatia (presence in other markets - the world level, European level, the strategic focus: generics business...), the profitability of pharmaceutical companies. Supply and demand of pharmaceutical products: concept and demand curve, determinants of demand; concept and supply curve, determinants of supply; supply and demand in the short period in relation to long period. Elasticity of demand and the supply of pharmaceutical products: The concept of elasticity as measure of changes in supply and demand; price, income and cross elasticity; research studies of elasticity in pharmaceutical industry. Production and costs of production of pharmaceutical products: analysis of production and the cost of production (short vs. long period), research and development, the cost of innovation, mergers of pharmaceutical companies as a way of capitalization synergy effects.		
Recommended reading	Ethan N. Parvis, The Pharmaceutical Industry: Issues and Outlook, Nova Science Publishers, 2002.; Ivan Pavić, Đuro Benić, Iraj Hashi, Mikroekonomija, Ekonomski fakultet, Split, 2007.		
Supplementary	John J. Campbell, Understanding Pharma: The First, Practical Guide on How		

reading	Pharmaceutical and Biotech Companies Really Work, Pharmaceutical Institute, 2005.; Greenhaven Press, Pharmaceutical Industry, Cengage Gale, 2008.
Teaching methods	Lectures
Assessment methods	Written and oral examination.
Language of instruction	Croatian
Quality assurance methods	Quality assurance will be performed at three levels: (1) University Level, (2) Faculty Level by Quality Control Committee, (3) Lecturer's Level

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="6">Tribunal Pharmacy</td></tr>
<tr><td>Code</td><td>KMFI20</td><td>Year of study</td><td colspan="5">4.</td></tr>
<tr><td>Course teacher</td><td>Prof. dr.sc. Davorka Sutlović</td><td>Credits (ECTS)</td><td colspan="5">3</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Prof. dr.sc. Marija Definis-Gojanović,</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>T</td></tr>
<tr><td>30</td><td></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">0%</td></tr>
<tr><td colspan="8">COURSE DESCRIPTION</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="7">Passed exams from the 3rd year of the Program.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="7">1. Decribe basic terms from forensic toxicology
2. Recognize potentially toxic products that could cause chemical injuries
3. Interprete results of analysis for the expert testimony to the tribunal
4. Calculate blood alcohol concentration for the tribunal</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="7">1. Introduction into forensic toxicology, dose-response, hazard and risk. Identification of toxic compounds, drugs and drugs abuse. Drive under influence.

2. Samples: biological and other samples from crime scene

3. Screening tests: Cozart RapiScan aliva test for speed drug abuse detection and Dräger 7410^{plus} Alcometer for Breath alcohol determination.

4. Toxicological analysis - isolation and identification of drugs. Solid phase extraction and liquid – liquid extraction methods. Gas Chromatography; Gas Chromatography Mass Spectrometry; HP Liquid Chromatography and Atomic Absorption Spectrometry techniques.

5. Analysis of experimental data

6. Forensic expertise</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="4">☒ independent assignments
☐ multimedia
☒ laboratory
☐ work with mentor
☐ (other)</td></tr>
<tr><td>Student responsibilities</td><td colspan="7">In accordance to Rules of studying and Deontological code for USSM students.</td></tr>
<tr><td>Screening student work (name the</td><td>Class attendance</td><td>0.5</td><td>Research</td><td></td><td>Practical training</td><td colspan="2"></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		Report		(Other)	
	Essay		Seminar essay	0.5	(Other)	
	Tests		Oral exam	0.5	(Other)	
	Written exam	1.5	Project		(Other)	
Grading and evaluating student work in class and at the final exam	Written and oral examination at the end of the course.					

	Title	Number of copies in the library	Availability via other media
Required literature (available in the library and via other media)	1. Sutlović D, i sur. Osnove forenzične toksikologije		
	2. Plavšić F, Žuntar I. Uvod u analitičku toksikologiju		

Optional literature (at the time of submission of study program proposal)	1. Plavšić F, Wolf-Čoporda A, Lovrić Z, Čepelak D. Siguran rad s kemikalijama.
Quality assurance methods that ensure the acquisition of exit competences	▪ Teaching quality analysis by students and teachers ▪ Exam passing rate analysis ▪ Committee for control of teaching reports ▪ External evaluation
Other (as the proposer wishes to add)	

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="6">Oncological Pharmacy</td></tr>
<tr><td>Code</td><td>KMFI21</td><td>Year of study</td><td colspan="5">4</td></tr>
<tr><td>Course teacher</td><td>prof dr sc Eduard Vrdoljak</td><td>Credits (ECTS)</td><td colspan="5">3.0</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">doc dr sc Tomislav Omrčlen

doc dr sc marijo Boban</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>T</td></tr>
<tr><td>30</td><td>0</td><td>0</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">0%</td></tr>
<tr><td colspan="8">COURSE DESCRIPTION</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="7">Passed exams from the 3rd year of the Program.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="7">1. Describe and explain the mechanism of action of chemotherapy, immunotherapy, hormone therapy, gene therapy, anti-angiogenic therapyand anti-metastatic therapy
2. Decribe the oncogenesis, tumor transformation and process of metastasis
3. List the indication of a particular therapy for treating malignant tumors.
4. List, describe and explain the adverse effects of of chemotherapy, immunotherapy, hormone therapy, gene therapy, anti-angiogenic therapyand anti-metastatic therapy
5. Plan the process of preparation, ordination and optimal disposal (oncologic waste disposal) of oncologic medicaments</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="7">Basic oncology, tumor transformation, oncogens and their importance, biological base of tumor and process of metastasis. Fundamentals of etiology and tumor epidemiology also oncologic terms-TNM classification. Basic local treatment modalities such as surgical oncology, radiotherapy, hypothermic and photodynamic therapy. Basics of chemotherapy, immunotherapy, hormone therapy, gene therapy, anti-angiogenic therapy, anti-metastatic therapy. Multimodal principles in tumor treatment. The role of a pharmacist in a wide treatment of oncologic patients, in a process of clinical research studies and in a development of oncologic medicaments. Pharmacoeconomics in oncologic treatments and the process of preparation, ordination and optimal disposal (oncologic waste disposal) of oncologic medicaments.</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="4">☐ independent assignments
☐ multimedia
☐ laboratory
☐ work with mentor
☐ (other)</td></tr>
<tr><td>Student responsibilities</td><td colspan="7">In accordance to Rules of studying and Deontological code for USSM students.</td></tr>
<tr><td>Screening student work (name the</td><td>Class attendance</td><td>1.5</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		Report		(Other)	
	Essay		Seminar essay		(Other)	
	Tests		Oral exam		(Other)	
	Written exam	1.5	Project		(Other)	

Grading and evaluating student work in class and at the final exam	Final written test.		
Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Klinička onkologija, Vrdoljak - Šamija - Krajina, Medicinska naklada, 2. izdanje, 2013		
Optional literature (at the time of submission of study programme proposal)	Principles and practice of radiation oncology – Perez/Brady, 8.izdanje Principles and practice of oncology - de Vita/Hellman/Rosenberg, 11.izdanje		
Quality assurance methods that ensure the acquisition of exit competences	▪ Teaching quality analysis by students and teachers ▪ Exam passing rate analysis ▪ Committee for control of teaching reports ▪ External evaluation		
Other (as the proposer wishes to add)			

Course title	Analytical immunochemical methods		
Course code	KMFI22		
Type of course	Lectures, seminars, exercises (30+0+0)		
Level of course	Basic level course		
Year of study	4th year	**Semester**	VII. or VIII.
ECTS (Number of credits allocated)	3.0		
Name of lecturer	Dr. Biserka Pokrić, full professor		
Learning outcomes and competences	Introduction to immunochemical methods and their applications. The immunoassays can provide a cost-effective alternative or can be coupled with traditional techniques. The advantages of immunoassays include sensitivity, selectivity, speed of analysis, adaptability and a possibility of direct quantitative and qualitative identifications of substances in complex systems. Immunochemical methods can be applied in numerous fields of investigations from biomedicine, molecular biology and protein chemistry to chemical technology, including pharmacy. Control of pharmaceutical products, monitoring of drug metabolism, and influence of pharmaceutical products on environment can be carried out by immunochemical methods.		
Prerequisites	A basic knowledge of the mechanism of chemical reactions and the nature of chemical bonds.		
Course contents	Basic principles of immunochemical methods. Preparation of components required for immunochemical analyses. Immunochemical techniques: Immunoprecipitation, agglutination, inhibition of agglutination. Gel precipitation methods under diffusion conditions (single and double, one and two dimensional immunodiffusion). Electrophoresis and immunoelectrophoresis, blotting and immunodetection of blots. Radioimmunochemical methods (RIA). Immunoenzymatic (ELISA) and immunofluorescent methods (FIA). Pharmaceutical application of immunochemical methods.		
Recommended reading	P. Brousseau, M. Beaudet, Manual of immunological methods, CRC Press, Boca Raton, 1998.; J. Daussant, F. X. Desvaux, Introduction to immunochemical techniques for medical diagnosis, food quality control and environmental testing, ITC Press, Prague, 2007.; J. Goers, Immunochemical techniques laboratory manual, Academic Press, San Diego, 1993.; A. Johnstone, R. Thorpe, Immunochemistry in practice, Blackwell Science, Cambridge, MA, 1996.; T. M. Phillips, Analytical		

	techniques in immunochemistry, Dekker, New York, 1992.; B. Pokrić, Precipitation at equivalence and equilibrium: a method for the determination of equilibrium constants of reaction between multideterminant antigen and specific polyclonal antibodies, J Chem Inf Comput Sci 40: 524-529, 2000.; J. D. Pound, Immunochemical protocols, Humana Press., Totowa, NJ, 1998.; C. J. Van Oss, M. H. Van Regenmortel, Immunochemistry, Dekker, New York, 1994.
Supplementary reading	E. A. Padlan, Antibody-antigen complexes. R.G. Landes Co., Austin, Texas, 1994.; M. H. V Van Regenmortel, Structure of antigens. Vol. 3. CRC Press, Boca Raton, FL, 1996.
Teaching methods	Lectures, seminars, practice, multimedia and consultations
Assessment methods	Written and oral examination.
Language of instruction	Croatian, English
Quality assurance methods	Quality assurance will be performed at three levels: (1) University Level, (2) Faculty Level by Quality Control Committee, (3) Lecturer's Level

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">Pharmaceutical Forensics</td></tr>
<tr><td>Code</td><td>KMFI23</td><td>Year of study</td><td colspan="4">4.</td></tr>
<tr><td>Course teacher</td><td>Prof.dr.sc. Marija Definis-Gojanović</td><td>Credits (ECTS)</td><td colspan="4">3.0</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Prof.dr.sc. Davorka Sutlović</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>T</td></tr>
<tr><td>30</td><td></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="4">0%</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">Passed exams from the 3rd year of the Program.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">Apply the obtained knowledge in independent recognition of natural and violent health damage, signs and types of death

Understand the procedure of identification of living and dead persons

Understand the way of participation in legal operations and court trials

Understand the importance of well keeping pharmaceutical documentation and records</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="6">Health damage (relations between illness and injury)

Violent damage of the health – the basics of forensic traumatology (mechanical injuries, asphyxia, physical and psychical injuries; the specificity of injuries of particular body parts); traffic traumatism; suicide and homicide; the violence in the family and wider society

Basic in tanatology (definition and types of death; simulated death, agony; signs of death, post-mortem changes; estimation of the time of death; external examination of dead body, autopsy)

Selected chapters from forensic toxicology (taking samples for chemical-toxicological analysis; importance drugs in forensic toxicology; intoxication with alcohol and illicit drugs)

Medical criminalistic (crime scene, traces, identification)

Expert and expert testimony according to the Criminal Law and Criminal Procedure Law</td></tr>
<tr><td>Format of</td><td colspan="3">☒ lectures</td><td colspan="3">☐ independent assignments</td></tr>
</table>

<table>
<tr><td>instruction</td><td colspan="3">☐ seminars and workshops
☐ exercises
☐ on line in entirety
☐ partial e-learning
☐ field work</td><td colspan="3">☐ multimedia
☐ laboratory
☐ work with mentor
☐ (other)</td></tr>
<tr><td>Student responsibilities</td><td colspan="6">In accordance to Rules of studying and Deontological code for USSM students.</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</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>1</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">Written exam.</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">D. Zečević i sur., Sudska medicina i deontologija, 4.izd. Zagreb, Medicinska naklada, 2004.</td><td>15</td><td colspan="2"></td></tr>
<tr><td colspan="3"></td><td></td><td colspan="2"></td></tr>
<tr><td colspan="3"></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">- F. P. .Smith, Handbook of Forensic drug Analysis. Elseiver Academic Press, 2005.;

- J. Payne-James, A. Busuttil, W. Smock, Forensic Medicine – Clinical and Pathological Aspects. San Francisco: GMM, 2003.;

- T. Babić, S. Roksandić, Osnove zdravstvenog prava, Zagreb: Tipex, 2006.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="6">▪ Teaching quality analysis by students and teachers
▪ Exam passing rate analysis
▪ Committee for control of teaching reports
▪ External evaluation</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="6"></td></tr>
</table>

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="6">Drug Research & Development</td></tr>
<tr><td>Code</td><td>KMFI24</td><td>Year of study</td><td colspan="5">4.</td></tr>
<tr><td>Course teacher</td><td>prof.dr.sc. Siniša Tomić</td><td>Credits (ECTS)</td><td colspan="5">3.0</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>T</td></tr>
<tr><td>30</td><td></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">0%</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">Passed exams from the 3rd year of the Program.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">Decribe and explain the phases o drug development

List and explain the methods used during drug development

Explain the strategic route of innovative and generic pharamaceutical company

Explain the basic principles in drug marketing

Prepare a marketing plan for an OTC drug

Calculate a referent prize for a drug</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="6">- innovative and generic drugs, synthetic and biological drugs
- identification of molecular and physiological targets as action sites of the future drug, information from the sequence of the human genome, bottlenecks in targeted research
- rational drug design
- process of drug discovery corresponding to the sought goal: High-Throughput Screening (HTS), “Hit-to-Lead” strategy
- lead compound optimization
- intellectual property protection and patent rights
- non-clinical studies for the purpose of testing the safety of a future drug (pharmacodynamics, pharmacokinetics, ADME tox testing)
- good laboratory practice (GLP)
- clinical studies, stages I-IV
- pharmaceutical drug development
- drug approval
- The Formulary
- preparations for launching a drug
- drug life-cycle follow-up</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
☒ Homework</td></tr>
</table>

<table>
<tr><td>Student responsibilities</td><td colspan="6">In accordance to Rules of studying and Deontological code for USSM students.</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></td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td></td><td>Report</td><td></td><td>Homework</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></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">Final written exam.</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">Zakon o lijekovima</td><td></td><td colspan="2">Yes</td></tr>
<tr><td colspan="3">Pravilnik o oglašavanju lijekova</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">Shayne Cox Gad (2005), Drug Discovery Handbook, Wiley-Interscience

Madsen U. (2002), Textbook of Drug Design and discovery, CRC</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="6">▪ Teaching quality analysis by students and teachers
▪ Exam passing rate analysis
▪ Committee for control of teaching reports
▪ External evaluation</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="6"></td></tr>
</table>

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">Pharmaceutical Care and Self-Medication</td></tr>
<tr><td>Code</td><td>KMF501</td><td>Year of study</td><td colspan="4">5</td></tr>
<tr><td>Course teacher</td><td>Dr.sc. Arijana Meštrović, mag.pharm., lecturer</td><td>Credits (ECTS)</td><td colspan="4">3,5</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>T</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">0%</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">Passed exams from the 4th year of the Program.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">1. Reviewing the list of medications from patients
2. Assessing priorities in the treatment plan
3. Applying therapeutic guidelines for chronical diseases
4. Assessing patients' compliance
6. Reporting side-effects.
7. Preparing a plan of pharmaceutical care
8. Explaining the processes in self-medication</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="6">The basics of pharmaceutical care. Treatment with drugs. Preparation and execution of the treatment plan, supervision and evaluation of the treatment results. Co-operation in the pharmacy. Caring for one's own health. Pharmaceutical care and vigilance. Two-directional flow of information. Right to confidentiality. Collaboration of pharmacists and physicians. Prevention of medication errors and harmful events related to drug interaction. Decision to issue an over-the-counter medical product and auxiliary therapeutic agents (evaluation, supervision and influence on the quality of use of prescribed medications). The co-operability of patients in their healthcare. Assessing patients' perseverance in taking medications. Reporting side-effects. Responsibility of the drug producer. Pharmaceutical care in undergraduate studies. Specialist education in care and self-medication. Pharmaco-therapeutical manual. Advertising self-care medications. Placebo: a pharmaceutical problem. Service using a pictogram. Preparing a plan of pharmaceutical care for individual patients. Information about drugs. Seminar: problem-based learning, simulation of specific circumstances, practising patient consultation.</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒ lectures
☒ seminars and workshops
☐ exercises
☐ on line in entirety
☐ partial e-learning</td><td colspan="3">☒ independent assignments
☐ multimedia
☐ laboratory
☐ work with mentor
☐ (other)</td></tr>
</table>

<table>
<tr><td></td><td colspan="6">☐ field work</td><td colspan="3"></td></tr>
<tr><td>Student responsibilities</td><td colspan="9">In accordance to Rules of studying and Deontological code for USSM students.</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</td><td>Research</td><td></td><td colspan="2">Practical training</td><td colspan="2"></td></tr>
<tr><td>Experimental work</td><td></td><td>Report</td><td></td><td colspan="2">(Other)</td><td colspan="2"></td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td colspan="2">(Other)</td><td colspan="2"></td></tr>
<tr><td>Tests</td><td></td><td>Oral exam</td><td>1</td><td colspan="2">(Other)</td><td colspan="2"></td></tr>
<tr><td>Written exam</td><td>1.5</td><td>Project</td><td></td><td colspan="2">(Other)</td><td colspan="2"></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="9">Standardized written test and oral exam.</td></tr>
<tr><td>Required literature (available in the library and via other media)</td><td colspan="6">Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td></td><td colspan="6">1. Burke JM, Miller WA, Spencer AP, Crank W, Adkins L, et al. Clinical Pharmacists' Competencies
2. FitzGerald RJ. Medication errors: the importance of an accurate drug history. Br J Clin Pharmacol. 2009;67:671–5
3. Kim Y, Schepers G. Pharmacists' Intervention Documentation in US Health Care Systems. Hosp Pharm. 2003;38 (12):1141–1147
4. Newton D, Boyle M, Catizone AC. The NAPLEX – evolution, purpose, scope and educational implications. Am J Pharm Ed. 2008; 72(2):33
5. Pedersen CA, Schneider PJ, et al. ASHP national survey of pharmacy practice in acute care settings: Monitoring, patient education, and wellnes. Am J Health Syst Pharm. 2000; 57:2171–87
6. Planas GL, Kimberlin CL, Segal R, Brushwood DB, Hepler DC, Schlenker RB. A pharmacist model of perceived responsibility for drug therapy outcomes. Soc Sci Med 2005;60(10):2393-2403
7. Reeder TA, Mutnick A. Pharmacist-versus physician-obtained medication histories. Am J Health Syst Pharm. 2008;65:857–60
8. WHO. The World Health Report 2006 – Working Together for Health. Geneva, WHO; 2006
9. Wiedenmayer K, Summers RS, Mackie AC, et al. Developing pharmacy practice - A focus on patient care. The Hague, International Pharmaceutical Federation and World Health Organization; 2006</td><td></td><td></td></tr>
</table>

	10. World Health Organization and International Pharmaceutical Federation (FIP) *Developing Pharmacy Practice: A focus on patient care*. Handbook. Geneva, FIP, WHO; 2006		
	J. P. Rovers, J. D. Currie, H. P. Hagel, R. P. McDonough, A Practical Guide to Pharmaceutical Care, 2nd Edition, AphA Publications, 2003.		
	J. Vuković, Ljekarnička skrb i samoliječenje, u V. Grdinić, J. Vuković, Farmaceutska etika, deontologija i praksa, Jadran – Galenski laboratorij, Zagreb, 2000., str. 205-214; C.		
	H. Knowlton, R. P. Penna, Pharmaceutical Care, 2nd Edition, American Society of Health-System Pharmacists, 2002.;		
Optional literature (at the time of submission of study programme proposal)	V. Grdinić, Bolesnikova sigurnost: poboljšanje bolesnikove sigurnosti u Europi putem sigurne uporabe lijekova, HLJK, Zagreb, 2009.;		
Quality assurance methods that ensure the acquisition of exit competences	▪ Teaching quality analysis by students and teachers ▪ Exam passing rate analysis ▪ Committee for control of teaching reports ▪ External evaluation		
Other (as the proposer wishes to add)			

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="6">Clinical Pharmacology</td></tr>
<tr><td>Code</td><td>KMF502</td><td>Year of study</td><td colspan="5">5</td></tr>
<tr><td>Course teacher</td><td>prof. dr.sc.Jugoslav Bagatin</td><td>Credits (ECTS)</td><td colspan="5">5.5</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">doc.dr.sc. Nediljko Pivac

mr.sc. Vedran Carevič

dr.Jurica Nazlić</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>T</td></tr>
<tr><td>45</td><td>0</td><td>15</td><td></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="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">Passed exams from the 4th year of the Program.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">1. Describe and explain basics of PK and PD

2. Describe all the clinical phases in drug development

3. List and name all the documentation required before, during and after a clinical trial

4. Design a double blind RCT.

5. Explain the rational approach for the use of antiobiotics

6. Explain the importance of pharmacoeconomics</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="6">General principles of clinical pharmacology - bases of clinical pharmacokineticses, discovering and development of drugs pharmacoeconomic, pharmacoepidemiology, adverse reactions to marketed drugs and adverse reactions to drugs used in clinical trials (significance, differences and similarities), drug interactions (pharmacokinetic and pharmacodynamic), drugs in pregnancy – teratogenic effect of drugs, specific quality of clinic uses of drugs in the determined groups of patients, and determined damages of target organs, clinical testing of drugs, good clinic practice (GCP).

Rational pharmacotherapies of chosen clinic entities - in this part of course the use of medicines in the medical treatment of most frequent illnesses and states will be covered, and which has been characterized with the large consumption and significant share in the financial consumption (for example: antibacterail drugs, antihypertensives, hypolipemics drugs, benzodiazepines, antiulcer drugs, treatment of pain, oncologic medicines, especially expensive medicines, uses of medicines which are not in valid lists of drugs or which has not been registered in the Croatia and similarly.).</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒ lectures
☐ seminars and workshops
☒ exercises</td><td colspan="3">☒ independent assignments
☐ multimedia
☐ laboratory</td></tr>
</table>

<table>
<tr><td></td><td colspan="6">☐ on line in entirety
☐ partial e-learning
☐ field work</td><td colspan="2">☐ work with mentor
☐ (other)</td></tr>
<tr><td>Student responsibilities</td><td colspan="8">In accordance to Rules of studying and Deontological code for USSM students.</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></td><td>Research</td><td></td><td>Practical training</td><td></td><td></td><td></td></tr>
<tr><td>Experimental work</td><td></td><td>Report</td><td></td><td colspan="2">(Other)</td><td></td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td colspan="2">(Other)</td><td></td></tr>
<tr><td>Tests</td><td></td><td>Oral exam</td><td></td><td colspan="2">(Other)</td><td></td></tr>
<tr><td>Written exam</td><td></td><td>Project</td><td></td><td colspan="2">(Other)</td><td></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="8">Final 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">-Katzung BG, Masters S, Trevor AJ, urednici. „Temeljna i klinička farmakologija“,1. Hrvatsko izdanje, Zagreb, Medicinska naklada, 2011.</td><td></td><td></td></tr>
<tr><td colspan="5">-Francetić I, Vitezić D, urednici. „Klinička farmakologija „, 2. Hrvatsko izdanje, Zagreb, Medicinska naklada, 2014.</td><td></td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="8"></td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="8">▪ Teaching quality analysis by students and teachers
▪ Exam passing rate analysis
▪ Committee for control of teaching reports
▪ External evaluation</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="8"></td></tr>
</table>

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="6">Clinical Pharmacy</td></tr>
<tr><td>Code</td><td>KMF503</td><td>Year of study</td><td colspan="5">5.</td></tr>
<tr><td>Course teacher</td><td>assist. prof. dr. sc. Selma Škrbo</td><td>Credits (ECTS)</td><td colspan="5">4.0</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Jelena Kačić, mag. pharm., Marina Cokarić, mag. pharm., Antonija Šarić, mag.pharm.</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>T</td></tr>
<tr><td>15</td><td>15</td><td>15</td><td></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="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">Passed exams from the 4th year of the Program.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">1. Explain the activity of the clinical pharmacist
2. Describe the concept of evidence based medicine/pharmacy
3. Select the appropriate source of drug information
4. Calculate safe and efficient drug dose in special population, and after kidney/liver disease
5. Plan a therapeutic drug monitoring intervention in a patient
6. Explain interactions and adverse effects for different group of drugs
7. Describe and explain the critical lab results for assessment of drug efficacy and safety, for specific drugs
8. Explain the basic principle of parenteral nutrition.</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="6">Lectures:

General part

Practical pharmacokinetics and pharmacodynamics. Basic clinical and laboratory data in monitoring drug response. Pharmacotherapy of specific drug groups. Dose adjustment in patients with impaired liver or kidney function - nomograms, e.g., of gentamicin. Preparation of citotoxic therapy. Parenteral nutrition. Generic drugs, very expensive drugs, orphan drugs

Clinical pharmacy in the treatment of certain disorders

(some of these topics to be dealt with at seminars)

Gastrointestinal disorders (inflammatory intestinal diseases). Cardiovascular disorders. Respiratory disorders. Neurological and psychological disorders. Infections. Endocrine disorders. Gynecological disorders. Urological disorders. Hematological disorders. Malignant diseases and drug administration. Rheumatic disorders. Disorders of the eye and ear. Skin disorders.

Exercises</td></tr>
</table>

	Therapeutic monitoring of drugs having a narrow therapeutic index: warfarin, teophilin, digoxin, antiepileptics, aminoglycosides, antiarrhythmics. Dose adjustment in patients with impaired kidney or liver function. Problem base learning – Practical examples.					
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)			
Student responsibilities	In accordance to Rules of studying and Deontological code for USSM students.					
Screening student work *(name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)*	Class attendance		Research		Practical training	
	Experimental work		Report		(Other)	
	Essay		Seminar essay		(Other)	
	Tests		Oral exam		(Other)	
	Written exam	4.0	Project		(Other)	
Grading and evaluating student work in class and at the final exam	Final written exam.					

	Title	Number of copies in the library	Availability via other media
Required literature (available in the library and via other media)	-Katzung BG, Masters S, Trevor AJ, urednici. „Temeljna i klinička farmakologija“,1. Hrvatsko izdanje, Zagreb, Medicinska naklada, 2011.		
	Walker R., Edwards C. (eds.): Klinička farmacija i terapija (prevod udžbenika Clinical Pharmacy and Therapeutics (Clinical Pharmacy and Therapeutics, 2nd ed., Churchill Livingstone, Edinburgh, 2000), 2nd ed., Školska knjiga, Zagreb, 2004		
	Hand-outs		
Optional literature (at the time of submission of study programme proposal)	1. Russell J Greene and Norman D Harris. Pathology and Therapeutics for Pharmacists. A basis for clinical practice. Third edition, RPS Publishing, 2008 2. John E. Murphy. Clinical Pharmacokinetics, Fifth edition. ASHP, Bethesda, Maryland, 2011 3. Michael E. Winter. Basic Clinical Pharmacokinetics, Fourth edition. Lippincot Williams & Wilkins, 2004		

Quality assurance methods that ensure the acquisition of exit competences	▪ Teaching quality analysis by students and teachers ▪ Exam passing rate analysis ▪ Committee for control of teaching reports ▪ External evaluation
Other (as the proposer wishes to add)	

NAME OF THE COURSE	Clinical Laboratory Diagnostics					
Code	KMF504	Year of study	5.			
Course teacher	Assist. prof. dr. sc. Ilza Salamunić	Credits (ECTS)	5.0			
Associate teachers	Leida Tandara, mag. med. biok. spec., lecturer, Nada Bilopavlović, mag. med. biok., spec., lecturer, Daniela Šupe-Domić, mag. med. biok., spec., lecturer.	Type of instruction (number of hours)	L	S	E	T
			30	15	30	
Status of the course	Mandatory	Percentage of application of e-learning	0%			

COURSE DESCRIPTION		
Course enrolment requirements and entry competences required for the course	Passed exams from the 4th year of the Program.	
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	1. Explain the potential of laboratory diagnostics for assessing the correct diagnosis, therapeutic monitoring, disease progresion and efficacy to treatment 2. Diferentiate analytical and biological influence on the result of laboratory tests 3. Explain the significance of laboratory diagnostics for specific, frequent diseases 4. Recognize the effect of drugs on the results of laboratory tests 5. Decribe and explain the basics of *evidence based laboratory medicine*	
Course content broken down in detail by weekly class schedule (syllabus)	Human biochemistry and physiology, specific biochemical alterartion and laboratory tests. Principles of analysis and techniques used in clinical biochemistry laboratory. Understand the roles (screening, diagnosis, monitoring) and limitations for laboratory testing in clinical practice for the following: Physiology and disorders of water, electrolyte and acid-base metabolism; kidney and urinary tract diseases, cardiovascular diseases, hepatobiliary diseases, gastro-intestinal and exocrine pancreatic disease, endocrine disorders, lipid and lipoprotein disorders, biochemistry of calcium, phosphorus and vitamin D metabolism, genetic diseases, immune system disorders. Hematology/coagulation: Principles of blood homeostasis and morphology and function of cellular elements of blood. Recomended laboratory tests for diagnosis and management of hematologic diseases and disordered hemostasis with biochemical implications. Therapeutic drug monitoring	
Format of instruction	☒ lectures ☒ seminars and workshops ☒ exercises ☐ *on line* in entirety	☐ independent assignments ☐ multimedia ☒ laboratory ☐ work with mentor

<table>
<tr><td></td><td colspan="6">☐ partial e-learning
☐ field work</td><td colspan="2">☒ consultations</td></tr>
<tr><td>Student responsibilities</td><td colspan="8">In accordance to Rules of studying and Deontological code for USSM students.</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>2</td><td>Research</td><td></td><td>Practical training</td><td>0.5</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>0.5</td><td>Oral exam</td><td></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 colspan="6"></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="8">Final written exam.</td></tr>
<tr><td rowspan="5">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">1. Čvorišček D, Čepelak I. (ur.). Štrausova medicinska biokemija. Zagreb: Medicinska naklada; 2009.</td><td></td><td></td></tr>
<tr><td colspan="5">2. Sertić J. i sur. Klinička kemija i molekularna dijagnostika. Zagreb: Medicinska naklada; 2008.</td><td></td><td></td></tr>
<tr><td colspan="5">3. Topić E, Primorac D, Janković S, urednici. Medicinskobiokemijska dijagnostika u kliničkoj praksi. Zagreb: Medicinska naklada; 2004.</td><td></td><td></td></tr>
<tr><td colspan="5"></td><td></td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="8">1. Thomas L. Clinical laboratory diagnostics (Use and assessment of clinical laboratory results). Frankfurt/Main: TH Books Verlagsgesellschalf mbH; 1999.

2. Burtis CA, Ashwood ER, editors. Tietz fundamentals of clinical chemistryb and Molecular Diagnostics. 7 e. Philadelphia (PA): Saunders; 2014.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="8">▪ Teaching quality analysis by students and teachers
▪ Exam passing rate analysis
▪ Committee for control of teaching reports
▪ External evaluation</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="8"></td></tr>
</table>

NAME OF THE COURSE	Pharmaceutical Ethics and Deontology					
Code	KMF505	Year of study	5			
Course teacher	Prof. dr. Darko Duplančić	Credits (ECTS)	2.0			
Associate teachers	Prof. dr. Marija Definis-Gojanović Doc. dr. sc. Slavica Kozina, mr. Mate Portolan, lecturer	Type of instruction (number of hours)	L	S	E	T
			30	0	0	
Status of the course	Mandatory	Percentage of application of e-learning	0%			

COURSE DESCRIPTION

Course enrolment requirements and entry competences required for the course	Passed exams from the 4th year of the Program.
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	1. Describe and explain the ethical conflicts in drug administration 2. Describe and explain moral dilemmas in drug information 3. Explain the conflicts of interest (e.g. in drug promotion) 4. Explain the dynamics of pharmacist-patient-physician relationship. 5. Support patient's rights to confidentiality
Course content broken down in detail by weekly class schedule (syllabus)	Phylosophical, theological, psychological, sociological aspects of pharmaceutical/medical ethics. Bioethics. Equitiy & human rights. Pharmacist-patient-physician relationship. Pharmaceutical deontology. Legal issues. Ethical committees. Medical interventions. Clinical trials. Informed consent. Moral dilemmas in drug information. Conflicts of interest (e.g. in drug promotion). Patients' attitudes. Ethical problems at the beginning & end of life (e.g. contraception, IVF, gene therapy, assited suicide). Drug registration, drug lists, cost containment, complementary/alternative medicines. Ethical analysis of a promotional lecture/article/drug insert.
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)
Student responsibilities	In accordance to Rules of studying and Deontological code for USSM students.

Screening student work *(name the proportion of ECTS credits for each activity so that the total number of*						
	Class attendance		Research		Practical training	
	Experimental work		Report		(Other)	
	Essay		Seminar essay		(Other)	

ECTS credits is equal to the ECTS value of the course)	Tests		Oral exam		(Other)	
	Written exam		Project		(Other)	
Grading and evaluating student work in class and at the final exam	Final written exam.					

	Title	**Number of copies in the library**	**Availability via other media**
Required literature (available in the library and via other media)	Buerki RA, Vottero LD. Ethical Responsibility in Pharmacy Practice. Madison: American Institute of the History of Pharmacy, 2002.		
	Craig RP, Middleton CL, O'Connell Lj. Etički komiteti, Praktični pristup, Zagreb, Pergamena, 1998.		
	Matulić T, Bioetika, Zagreb, GK, 2001.		
Optional literature (at the time of submission of study programme proposal)			
Quality assurance methods that ensure the acquisition of exit competences	▪ Teaching quality analysis by students and teachers ▪ Exam passing rate analysis ▪ Committee for control of teaching reports ▪ External evaluation		
Other (as the proposer wishes to add)			

NAME OF THE COURSE	Pharmacotherapy				
Code	KMF 506	Year of study	5.		
Course teacher	Prof. dr. Jugoslav Bagatin	Credits (ECTS)	4.0		
Associate teachers	Doc.dr.sc.Nediljko Pivac Mr.sc.dr.Vedran Carević Dr.Jurica Nazlić	Type of instruction (number of hours)	L	S	E	T
			30	15	0	0
Status of the course	Mandatory	Percentage of application of e-learning	0%			

COURSE DESCRIPTION

Course enrolment requirements and entry competences required for the course	Successful completion of the 4th year of the Program.
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	1. Describe and anticipate adverse effects and interactions during simultaneous administration of 5+ drugs 2. Assess the lack of drug efficacy, related to the dose, way of administration and treatmen duration – explain the term: right drug at right time by right way in right dose. 3. Review the rational use of cardiovascular drugs in selected group of patients 4. Review the therapeutic approach to a patient with diarrhea 5. Review the significance of drug side effects manifested on skin
Course content broken down in detail by weekly class schedule (syllabus)	Rational pharmacotherapies of chosen clinic entities - Clinical cases on which students practise to identify problems (side effects, interactions, inefficient treatment, patient's lack of cooperation).
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)
Student responsibilities	In accordance to Rules of studying and Deontological code for USSM students.

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

equal to the ECTS value of the course)	Written exam		Project		(Other)	
Grading and evaluating student work in class and at the final exam	The exam is composed of the written test and oral exam that equally contribute to the final mark.					
Required literature (available in the library and via other media)	**Title**				**Number of copies in the library**	**Availability via other media**
	-Francetić I, Vitezić D, urednici. „Klinička farmakologija „, 2. Hrvatsko izdanje, Zagreb, Medicinska naklada, 2014.					
	hand-outs					
Optional literature (at the time of submission of study programme proposal)						
Quality assurance methods that ensure the acquisition of exit competences	▪ Teaching quality analysis by students and teachers ▪ Exam passing rate analysis ▪ Committee for control of teaching reports ▪ External evaluation					
Other (as the proposer wishes to add)						

Professional traineeship program

(in collaboration with the Croatian Pharmaceutical Chamber)

	1.month			
	1.week	2.week	3.week	4.week
Students	Learning about • Competency evaluation and compleeting the assignments of the proposed programme • Organization and management of pharmacy practice (responsibilities of pharmacists, equipment and facilities in community pharmacy) • Organizational structure, hierarchy, workplace management in the pharmacy, interpersonal communication • Dress code of pharmacist • Literature and handbooks (evidence based pharmacy) + information sources • Administration in pharmacy • Check the expiration dates of medicines and other products • Pharmacy waste disposal	Learning about • Dispensing • Procurement • Safe storage of drugs and medicinal substances (medicines, lightly volatile and flammable substances, poisons, chemicals, drugs that are kept at certain temperatures,...) • Merchandising • Pharmacists safety	Learning about • Drug classification (R, BR i BRX) • Administration and documentation important for dispensing • Counselling role of pharmacist (individual consultation) • Administration in pharmacy • Pricing • Tracking stock (shortages, seasonal assortment ...	Learning about Health insurance (HI) • Dispensing rules and classification • Administration of dispensing • Prescription - pharmacotherapy • Consultation during dispensing • Invoicing to the HI • Documentation in pharmacy • Importing the medicines
Students - assignments	• Study herbal products and supplements available in pharmacy – made a classification (indication list products) • Study dermocosmetics– made a classification (list products)	• Study herbal products and supplements available in pharmacy – made a classification (indication list products) • Study dermocosmetics– made a classification (list products)	• Select specific indication and prepare a short presentation on the OTC (indications, dosage, ADR, contraindications, application restrictions, interactions) • Special warnings -> product comparison Study ISKRA guidelines	• Select specific indication and prepare a short presentation on the OTC (indications, dosage, ADR, contraindications, application restrictions, interactions • Special warnings -> Product comparison

<table>
<tr><td></td><td colspan="4">2. month</td></tr>
<tr><td></td><td>5.week</td><td>6.week</td><td>7.week</td><td>8.week</td></tr>
<tr><td rowspan="2">Students</td><td>• Patient counselling under mentor's supervision
• Safe use of medicines (inhalers, eye drops..)
• ADR reporting (medicines, medicine devices, supplements and herbal products)
• Quality of medicines</td><td>Learning about

• Safe use of medicine devices p (screening devices, inhalers etc.)*</td><td>• Compounding (dosage, identification, device selection, labelling, dispensing)
• Laboratory diary
• Compounding and dispensing products with strong effects</td><td>Application of knowledge and skills learned in first 7 weeks under mentor's supervision

- Compounding and dispensing products

- Procurement and storage

- Invoicing</td></tr>
<tr><td colspan="4">• learning about pharmacotherapy, biosimmilars, generics, medicine forms
• learning about therapeutical guidelines in chronically ill patients
• identification and prevention of ADRs
• identification and prevention of clinically significant drug-drug, drug-food, drug-disease interactions
• dosage individualisation (paediatric doses, elderly, pregnancy, special patients)</td></tr>
<tr><td>Students - assignments</td><td colspan="4">• study instructions for medical devices
• Case studies – dosage individualisation
• Reporting ADRs
• 1x weekly present one simple case (prescription example) - mentor will help with case selection (warfarin, amiodaron, etc.)</td></tr>
</table>

<table>
<tr><td></td><td colspan="4">3. month</td></tr>
<tr><td></td><td>9.week – compounding</td><td>10.week – compounding</td><td>11.week – quality assessment</td><td>12.week – quality assessment</td></tr>
<tr><td>Students</td><td>Learning about
• GMP (Good Manufacturing Practice)
• Workplace management and organisation in laboratory
• Equipment, methodologies and technique in technology processes
• Devices selection
• Safe storage of compound medicines and products</td><td>• Learning about laboratory administration and documentation
• Pharmaceutical technology literature usage</td><td>Learning about
• GLP (Good Laboratory Practice),
• Workplace management and organisation in analytical laboratory
• methods used for quality control in the analytical laboratory</td><td>• Literature
• Learning about certificates and identification
• Learning about chemicals in analysis procedures
• Learning about expiration dates of medicines</td></tr>
<tr><td></td><td colspan="2">• Compounding – using pharmacopeia
• Documentations, prescriptions, administration</td><td colspan="2">• handling and storate of chemicals and reagents
• confirmation of quality and identification of a medicine/active compound
• storing of samples</td></tr>
<tr><td>Students - assignments</td><td colspan="2">Compounding examples and case studies (alcohol dilution, solutions, mixtures) counselling patients in usage, dosage, ADRs etc.</td><td colspan="2">• comparison of different monographs (min 10)
• preparation of a short presentation in the field of analytics</td></tr>
</table>

<table>
<tr><td></td><td colspan="4">4. month</td></tr>
<tr><td></td><td>13.week</td><td>14.week</td><td>15.week</td><td>16.week</td></tr>
<tr><td>Students</td><td colspan="4">Appication of knowledge and skills learned in first 12 weeks under mentor’s supervision
- compounding and dispensing products
- procurement and storage
- invoicing</td></tr>
<tr><td>Students - assignments</td><td colspan="4">1x weekly present one simple case (prescription example) - mentor will help in case selection</td></tr>
</table>

<table>
<tr><td></td><td colspan="3">5. month</td></tr>
<tr><td></td><td>17.week</td><td>18.week</td><td>19.week</td></tr>
<tr><td>Students</td><td colspan="3">- Application of knowledge and skills learned in first 16 weeks under mentor’s supervision
- Compounding and dispensing products
- Procurement and storage
- Invoicing</td></tr>
</table>

Students - assignments	• 1x daily present one simple case (prescription example) - mentor will help in case selection • 1 complex case weekly (polypharmacy, complex patient, patients profile and personal record)

<table>
<tr><td></td><td>5.month</td><td colspan="3">6.month</td></tr>
<tr><td></td><td>20.week - hospital pharmacy</td><td>21.week - hospital pharmacy</td><td>22.week – hospital pharmacy</td><td>23.week / 24.week</td></tr>
<tr><td rowspan="2">Students</td><td>Learning about

• work management and organisation in hospital pharmacy
• roles of hospital pharmacist
• pharmacotherapy in hospital setting, laboratory, sanitet
• storage in hospital pharmacy</td><td>• procurement
• distribution on hospital departments
• hospital administration and documentation
• laboratory diary</td><td>• Learning about role of clinical pharmacist
• Visit patients in different hospital departments</td><td>Application of knowledge and skills learned in first 7 weeks under mentor’s supervision

- compounding and dispensing products

- procurement and storage

- invoicing

Feedback and evaluation</td></tr>
<tr><td colspan="2">• compounding hospital products (infusions, solutions, prescriptions)</td><td></td><td>• information about licensure
• education and competency development
• role of national organizations (Chamber, Society, Agency for medicines)</td></tr>
<tr><td>Students - assignments</td><td></td><td></td><td>Patient profile and personal record</td><td>• 1x daily present one simple case (prescription example) - mentor will help in case selection
• 1 complex case weekly - polypharmacy, complex patients</td></tr>
</table>

3. STUDY PERFORMANCE CONDITIONS

3.1. List of teachers and associate teachers

Course	Teachers and associate teachers
Analytical Chemistry I	Doc. dr. sc. Lea Kukoč Modun
Analytical Chemistry II	Doc. dr. sc. Lea Kukoč Modun
Applied Biochemistry	Doc. dr. sc. Vedrana Čikeš Čulić
Biology of Plants and Animals	Doc.dr.sc. Vesna Boraska Perica
Biotechnological Process of the Pharmaceutical Industry	Prof. dr. sc. Branka Andričić
Clinical Laboratory Diagnostics	Doc. dr. sc. Ilza Salamunić
Clinical Pharmacology	Prof. dr. sc. Jugoslav Bagatin
Clinical Pharmacy	Doc. dr. sc. Selma Škrbo
Drug Biochemistry	Prof. dr. sc. Marica Medić-Šarić
Extemporaneous Preparations	Prof.dr.sc. Mira Bečirević Laćan
General and Inorganic Chemistry	Izv. prof. dr. sc. Slobodan Brinić, Prof.dr. sc. Zoran Grubač
General Biochemistry	Izv. prof. dr. sc. Olivera Politeo
General Pharmacology	Izv. prof. dr. sc. Darko Modun
Human Anatomy and Histology	Izv.prof.dr.sc. Katarina Vukojević, Doc.dr.sc. Sandra Kostić
Immunology and Vaccines	Prof. dr. sc. Janoš Terzić
Instrumental Methods of Analysis	Doc. dr. sc. Lea Kukoč Modun
Introduction to Pharmacy	Mate Portolan, mag.pharm., predavač
Mathematics and Statistics for Pharmacists	Mr. sc. pred. Branka Gotovac
Molecular Biology with Genetics	Prof. dr. sc. Janoš Terzić
Operations of Pharmaceutical Technology	Prof. dr. sc. Nenad Kuzmanić
Organic Chemistry I	Prof. dr. sc. Igor Jerković
Organic Chemistry II	Izv. prof. dr. sc. Ani Radonić
Pathology	Prof.dr.sc. Valdi Pešutić-Pisac
Pathophysiology	Izv. prof. dr. sc. Tina Tičinović Kurir
Pharmaceutical Botany	Izv.prof. dr.sc.Valerija Dunkić
Pharmaceutical Care and Self-Medication	Dr.sc. Arijana Meštrović
Pharmaceutical Chemistry I	Prof. dr. sc. Marica Medić-Šarić
Pharmaceutical Chemistry II	Prof. dr. sc. Davorka Završnik
Pharmaceutical Ethics and Deontology	Izv. prof. dr. sc. Darko Duplančić
Pharmaceutical Formulations	Prof.dr.sc. Mira Bečirević Laćan
Pharmaceutical Legislation	Izv.prof.dr.sc. Siniša Tomić
Pharmaceutical Microbiology	Izv. prof. dr. sc. Marija Tonkić

Pharmaceutical Nomenclature	Izv.prof.dr.sc. Siniša Tomić
Pharmaceutical Quality Control	Prof. dr sc. Miroslav Šober
Pharmaceutical Toxicology	Izv. prof. dr.sc. Davorka Sutlović
Pharmacognosy	Prof. dr. sc. Igor Jerković
Pharmacopoeia	Izv.prof.dr.sc. Siniša Tomić
Pharmacotherapy	Prof. dr. sc. Jugoslav Bagatin
Physical Biochemistry	Prof. dr. sc. Mladen Miloš
Physical Chemistry	Izv. prof. dr. sc. Renato Tomaš
Physics for Pharmacists	Izv. prof. dr.sc. Magdi Lučić Lavčević
Physiology	Prof. dr. sc. Zoran Valić
Quality of Natural Medicinal Products	Doc. dr. sc. Aleksandra Marjanović
Scientific Methodology in Pharmacy	Prof. dr. sc. Matko Marušić
Special Pharmacology I	Prof. dr. sc. Mladen Boban
Special Pharmacology II	Izv. prof. dr. sc. Darko Modun
Technology of Synthetic Drugs	Prof. dr. sc. Branka Andričić

3.2. Curriculum vitae of the course teacher

First and last name and title of teacher	**Branka Andričić, PhD, Full Professor**
The course he/she teaches in the proposed study programme	Technology of Synthetic Drugs Biotechnological Processes in Pharmaceutical Industry
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) 2. Catalysis, undergraduate study of Chemical Technology
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	
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 Biotechnological Processes: Av. Grade: > 4.5 (based on four academic years)

First and last name and title of teacher	**Professor Jugoslav Bagatin, MD. Ph.D.**
The course he/she teaches in the proposed study programme	Clinical Pharmacology Pharmacotherapy
GENERAL INFORMATION ON COURSE TEACHER	
Address	Sv. Martin , Magistrala 61, 21312 Podstrana
Telephone number	+385 21 330 318
E-mail address	Jugoslav.bagatin&kbsplit.hr
Personal web page	///
Year of birth	1949.
Scientist ID	61246
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	Professor from 2010
Area and field of election into research or art rank	Biomedicine & Health, clinical medicine (clinical pharmacology, internal medicine, cardiology)
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Clinical hospital centre Split
Date of employment	1.12.1978.
Name of position (professor, researcher, associate teacher, etc.)	Professor
Field of research	Clinical pharmacology, internal medicine, cardiology
Function	
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Ph:D.
Institution	University of Split School of Medicine
Place	Zagreb
Date	1994
INFORMATION ON ADDITIONAL TRAINING	
Year	1983
Place	Zagreb
Institution	Zagreb Medical Facult, Clinical hospital centre Zagreb
Field of training	Base and clinical pharmacology
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
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** (years) of the subjects of internal medicine, clinical pharmacology and cardiology, Split Faculty of medicine. **Leader** of the subject of internal medicine, Split, Faculty of dental medicine. **Leader** of the subject of clinical pharmacology for Split, study of sisters **Leader** of the subject of clinical pharmacology and Pharmacotherapy, Split, Faculty of pharmacy **Chief** of catedra Patient and doctor I Split, Faculty of medicine (from 1997-2005),
Authorship of university/faculty textbooks in the field of the course	**1. Bagatin J.** Nuspojave i interakcije lijekova . U HKD ur.

	Lijekovi i .njihova racionalna primjena.Zagreb, 2005: str.14-25. **2. Bagatin J.** Primjena lijekova u starijih osoba. U Francetić I, Vitezić D, ur. Osnove kliničke farmakologije. Zagreb 2007, Medicinska naklada, 174-182. **3**. Polić S, Lukin A, **Bagatin J.** ur. Odabrana poglavlja iz kardiovaskularnog liječenja. Split. 2004,. Jedinica za znanstveni rad kliničke bolnice Split, 375 strana, i 2008 439 str. 4. Punda-Polić V, **Bagatin J**, Bradarić N: "Antibiotici-racionalna primjena"Jedinica za znanstveni rad, KB Split 1998 (288 str.) i 2001 godine (348 str) **5. Bagatin J.** Primjena lijekova u starijoj dobi . U Francetić I, Vitezić D. Klinička farmakologija, II izdanje. Zagreb 2014. Medicinska naklada. 284-294
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	**1.**Korljan–Babić B, ***Bagatin J***, Kokić S, Barišić-Ostojić S, Carević V, Berović N. Comparison between continous ambulatory arterial blood pressure monitoring and standard blood pressure measurements among patients of younger and older age group. **Coll Antropol 2009;33:65-70** **2.** Škerk V, Andrašević AT, Andrašević S, Sušić E, Džepina AM, Mađarić V, Milutinović S, Krhen I, Perić L, ***Bagatin J***, Corić M, Ferlin D, Cazin I, Tomac G. ISKRA smjernice antimikrobnog liječenja i profilakse infekcija mokraćnog sustava-hrvatske nacionalne smjernice. Liječ Vjesn 2009;131:105-180. **3.** Korljan B, ***Bagatin J,*** Kokić S, Berović-Matulić N, Baršić-Ostojić S, Deković A. The impact of hormon replacement therapy on metabolic syndrome components in perimenopausal women. **Med Hypotheses 2010;74: 162-163.** **4**. Carev M, Karanović N, ***Bagatin J***, Berović Matulić N, Pecotić R, Valić M, Marinović-Terzić I, Karanović S, Đogaš Z. Blood pressure dipping and salivary cortisol as markers of fatigue and sleep deprivation in staff anesthesiologists**. Coll Antropol 2011;35:133-138.** 5. ***Bagatin J.*** Uvodnik. Medicus 2010;19,2:115-116.(indeksiran EMBASE/Excerpta medica).
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	A lifetime Award of Podstrana community for an entire contribution to the society A letter of thanks and a Charter of the Croatian medical association for contribution to science
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	**Professor Mira Bečirević Laćan, PhD**
THE COURSE HE/SHE TEACHES IN THE PROPOSED STUDY PROGRAMME	Pharmaceutical Formulations Extemporaneous Preparations
GENERAL INFORMATION ON COURSE TEACHER	
ADDRESS	Zagreb, Nova ves 53
TELEPHONE NUMBER	01/4666-708
E-MAIL ADDRESS	mira_becirevic@yahoo.com
PERSONAL WEB PAGE	
YEAR OF BIRTH	1947.
SCIENTIST ID	2761
RESEARCH OR ART RANK, AND DATE OF LAST RANK APPOINTMENT	Scientific advisor, june, 1999.
RESEARCH-AND-TEACHING, ART-AND-TEACHING OR TEACHING RANK, AND DATE OF LAST RANK APPOINTMENT	Full professor, may *2000.* Full professor (permanent), july 2005.
AREA AND FIELD OF ELECTION INTO RESEARCH OR ART RANK	Biomedicine & Health, Pharmacy
INFORMATION ON CURRENT EMPLOYMENT	
INSTITUTION WHERE EMPLOYED	Faculty of Pharmacy and Biochemistry, University of Zagreb - retired
DATE OF EMPLOYMENT	1971.
NAME OF POSITION (PROFESSOR, RESEARCHER, ASSOCIATE TEACHER, ETC.)	*Professor*
FIELD OF RESEARCH	PHARMACEUTICAL TECHNOLOGY
FUNCTION	_____
INFORMATION ON EDUCATION – HIGHEST DEGREE EARNED	
DEGREE	Ph:D.
INSTITUTION	Faculty of Pharmacy and Biochemistry, University of Zagreb _____
PLACE	Zagreb
DATE	12.05.1982.
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)	**Graduate study programe** **Drug formulations** - Faculty of Pharmacy and Biochemistry, University of Zagreb **Prescription pharmacy** - Faculty of Pharmacy and Biochemistry, University of Zagreb **Postgraduate study programme** **New drug formulations** – postgraduate study "Drug development" Faculty of Pharmacy and Biochemistry, University of Zagreb **Drug formulations and availability** – postgraduate study "Clinical pharmacy" Faculty of Pharmacy and Biochemistry, University of Zagreb **Drug formulations for dermal application** – postgraduate study "Dermatopharmacy and cosmetics" Faculty of Pharmacy and Biochemistry, University of Zagreb **Drug delivery** – doctoral study Faculty of Pharmacy and Biochemistry, University of Zagreb
AUTHORSHIP OF UNIVERSITY/FACULTY TEXTBOOKS IN THE FIELD OF THE COURSE	**M. Bećirević**, R.Senjković, Oblikovanje lijekova, Liber, Zagreb, 1997 **M. Bećirević Laćan**, M.Jug, Magistralna receptura (praktikum) Zagreb, 2008 **M. Bećirević Laćan** , M.Jug, Oblikovanje lijekova (praktikum), Zagreb,2007.
PROFESSIONAL, SCHOLARLY AND ARTISTIC ARTICLES PUBLISHED IN THE LAST FIVE YEARS IN THE FIELD OF THE COURSE (5 WORKS AT MOST)	M. Jug, **M. Bećirević-Laćan**, Multicomponent complexes of piroxicam with cyclodextrins and hydroxypropyl methylcellulose, ***Drug Dev. Ind. Pharm.* 30 (2004) 1051-1060.** M. Jug, **M. Bećirević-Laćan**, Screening of mucoadhesive microparticles containing hydroxypropyl-beta-cyclodextrin for the nasal delivery of risperidone**, *Comb. Chem. High T. Scr.* 10 (2007) 358-367.** M. Jug, **M. Bećirević-Laćan**, Development of a cyclodextrin based nasal delivery system for lorazepam**, *Drug Dev. Ind. Pharm.* 34 (2008) 817-826**. M. Jug, **M. Bećirević-Laćan**, S. Bengez. Novel cyclodextrin-based film formulation intended for buccal delivery of atenolol, ***Drug Dev. Ind. Pharm.* 35 (2009) 796-807.** M. Jug, I. Kos**, M. Bećirević-Laćan.** The pH-dependent complexation between risperidone and hydroxypropyl-□-cyclodextrine, **J. Incl. Phen. Macrocyc. Chem. 64 (2009) 169-172.**
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)	Drug delivery of biological active substances Nano drug delivery
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 University of Zagreb, Faculty of Pharmacy and Biochemistry, 2012.
RESULTS OF STUDENT EVALUATION TAKEN IN THE LAST FIVE YEARS FOR THE COURSE THAT IS COMPARABLE TO THE COURSE DESCRIBED IN THE FORM (EVALUATION ORGANIZER, AVERAGE GRADE, NOTE ON GRADING SCALE AND COURSE EVALUATED)	____

First and last name and title of teacher	**Ph.D. Tea Bilusic, Full Professor**
The course he/she teaches in the proposed study programme	Dietetics
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	Introduction to Food Science; Milk and Dairy Technology (undergaduate study of Chemical Technology) Hygiene and Sanitation; Fruits and Vegetables Processing

study programme)	(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 works at most)	1. Politeo, O., Botica, I., **Bilusic, T**., Jukic, M., Carev, I., Burcul, F., Milos, M.: Chemical composition and evaluation of acetylcholinesterase inhibition and 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	**Professor, Mladen Boban, M.D., Ph.D.**
The course he/she teaches in the proposed study programme	Special Pharmacology I
GENERAL INFORMATION ON COURSE TEACHER	
Address	Dubrovacka 3, Split
Telephone number	021 531 621
E-mail address	mladen.boban@mefst.hr
Personal web page	
Year of birth	1964
Scientist ID	207836
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 reelected-permanent title, 15.07.2010.
Area and field of election into research or art rank	Biomedicine &health, Basic medical sciences
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	University of Split School of Medicine
Date of employment	1993
Name of position (professor, researcher, associate teacher, etc.)	Professor
Field of research	Pharmacology, Functional foods
Function	Head of the Department
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Ph.D.
Institution	University of Zagreb
Place	Zagreb
Date	21.04.1995
INFORMATION ON ADDITIONAL TRAINING	
Year	1989-1992
Place	Milwaukee, USA
Institution	Medical College of Wisconsin
Field of training	Cardiovascular pharmacology
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)	Pharmacology, at different study programme, Graduate: Medicine, Dental Medicine, Pharmacy Bachelor's ***degree: Nursing, Medical Laboratory Diagnostics, Radiology***

	Postgraduate: Pharmacodynamics, Medical School Zagreb Electrophysiology of antiarrhythmics , Doping, Medical School in Split Visiting professor, Medical School in Mostar, Bosnia and Hercegovina,
Authorship of university/faculty textbooks in the field of the course	1. M Boban. Ishemijsko-reperfuzijska oštećenja miokarda. U: Hitna stanja u kardiologiji i angiologiji. Ur. Polić S, Lukin A. Znanstvena jedinica KB "Split" 1995;155-169. 2. M. Boban. Akutno trovanje i predoziranje lijekova. U: Principi interne medicine. Ur: KJ Isselbacher, E Braunwald, JD Wilson, JB Martin, AS Fauci, DL Kasper, 1. hrvatsko izdanje, Placebo, Split, 1997. (textbook, translation from English,) 3. M Boban. Ishemijsko-reperfuzijska oštećenja miokarda. U: Hitna stanja u kardiologiji i angiologiji (2. promijenjeno izdanje). Ur. Polić S, Lukin A. Jedinica za znanstveni rad, KB "Split" 1999;219-236. (postgraduate professional training handbook) 4. M. Boban. Opći anestetici; Antiaritmici. U: "Medicinska farmakologija". Ur: M Bulat, J Geber, Z Lacković. Medicinska naklada – Zagreb, 2001. (Textbook) 5. M Boban. Srce; Krvožilni sustav; Ateroskleroza i metabolizam lipoproteina; Hemostaza i tromboza; Hematopoezni sustav. U: "Farmakologija". Ur: Rang HP, Dale MM, Ritter JM, Moore PK. Prvo hrvatsko izdanje. Zagreb: Golden marketing- Tehnička knjiga; 2006. (textbook, translation from English,)) 6. M Boban i sur. Utjecaj adrenergičkih i kolinergičkih agonista i antagonista na parametre srčane funkcije na modelu izoliranog srca; Utjecaj lijekova na značajke akcijskog potencijala u izoliranom srcu; Mehanizmi vazodilatacijskog učinka lijekova: model izoliranih vaskularnih prstenova štakorske aorte. U: "Farmakološki priručnik". Ur: Bradamante V, Klarica M, Šalković-Petrišić. Medicinska naklada, Zagreb, 2008. (handbook) 7. M Boban i sur: Vazodilatatori i liječenje angine pektoris; Lijekovi za liječenje zatajenja srca; Lijekovi za liječenje srčanih aritmija; Vazoaktivni peptidi; tetraciklini, makrolidi, klindamicin, kloramfenikol, streptogramini i okszolidinoni. U: „Temeljna i klinička farmakologija“. Ur: Katzung BG, Masters SB, Trevor AJ.

	11.izdanje, Medicinska naklada, Zagreb, 2011. (textbook, translation from English)
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. Tuberoso CIG., **Boban M**., Bifulco E, Budimir D, Pirisi FM. Antioxidant capacity and vasodilatory properties of Mediterranean food: The case of Cannonau wine, myrtle berries liqueur and strawberry-tree honey. *Food Chemistry* 2013;140(4):686-691. 2. Gunjaca G, Jeroncic A, Budimir D, Mudnic I, Kolcic I, Polasek O, Rudan I, **Boban M**. A complex pattern of agreement between oscillometric and tonometric measurement of arterial stiffness in a population-based sample. *J Hypertens 2012*;30(7):1444-1452. 3. Mudnic I, Budimir D, Modun D, Gunjaca G, Generalic I, Skroza D, Katalinic V, Ljubenkov I, **Boban M**. Antioxidant and vasodilatory effects of blackberry and grape wines. *J Med Food* 2012;15(3):315-321. 4. Murabito JM, White CC, Kavousi M, Sun YV, Feitosa MF, Nambi V, Lamina C, ...**Boban M**, .. Kronenberg F. Association between chromosome 9p21 variants and the ankle-brachial index identified by a meta-analysis of 21 genome-wide association studies. *Circ Cardiovasc Genet* 2012;5(1):100-112. 5. Krnic M, Modun D, Budimir D, Gunjaca G, Jajic I, Vukovic J, Salamunic I, Sutlovic D, Kozina B, Boban M. Comparison of acute effects of red wine, beer and vodka against hyperoxia-induced oxidative stress and increase in arterial stiffness in healthy humans. *Atherosclerosis* 2011;218(2):530-535.
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 Ministry of science, education and sports of Republic of Croatia, Scientific program 2160547, "Biological effects of wine and Mediterranean medicinal herbs" (Head of the program) 2007-2013 Ministry of science, education and sports of Republic of Croatia, Scientific project 216-2160547-0537, "Cardiovascular effects of wine and its constituents"(Principal investigator) 2012- 2014 EU Leonardo da Vinci partnership program „VET on Wine, Health and Responsible Drinking – Art de Vivre“ (Croatian partner) 2014-2018 Croatian Science Foundation „Biological effects of wine: the influence of vinification rechnology,dealcoholization and aging of wine“ (Principal investigator)

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?	"Education of educators" Several courses and workshops (1997-2003)
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	1. Faculty award for mentorship to the Ph.D. students (2012) 2. Decoration: „Chevalier de l'Ordre du Merite Agricole" (Order of Agricultural Merit), Ministère de l'Agriculture, de l'Alimentation, de la Pêche, de la Ruralité et de l'Aménagement du territoire, The Republic of France, 2011. 3. National Science Awards of the Republic of Croatia in the field of biomedicine for the year of 2012.
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	

First and last name and title of teacher	**Assistant Professor, Vesna Boraska Perica**
The course he/she teaches in the proposed study programme	Medical Biology (medicine, dental medicine), Biology of plants and animals (farmacy)
GENERAL INFORMATION ON COURSE TEACHER	
Address	Znjanska 6, Split
Telephone number	0915341512
E-mail address	vboraska@mefst.hr
Personal web page	/
Year of birth	1977
Scientist ID	276771
Research or art rank, and date of last rank appointment	Higher scientific collaborator, 20.11.2013.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Assistant Professor, 4.03.2010.
Area and field of election into research or art rank	Natural sciences, Biology
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	University of Split Medical School
Date of employment	1.12.2002.
Name of position (professor, researcher, associate teacher, etc.)	Assistant Professor
Field of research	Human genetics
Function	Teacher, scientist
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	University of Zagreb, Faculty of Mathematics and Natural Sciences
Place	Zagreb
Date	18.07.2008.
INFORMATION ON ADDITIONAL TRAINING	
Year	2007, 2009-2010, 2011
Place	Oxford, Cambridge, Cambridge
Institution	Wellcome Trust Center for Human Genetics, Wellcome Trust Sanger Institute, Wellcome Trust Sanger Institute
Field of training	Statistical genetics
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)	Spanish, 3
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	Italian, 2
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)	Medical Biology (medicine, dental medicine), Biology of plants and animals (farmacy)

Authorship of university/faculty textbooks in the field of the course	Text „Genetic research of complex traits“
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	Boraska, V., Franklin, C.S., Floyd, et al. A genome-wide association study of anorexia nervosa. Mol Psychiatry. 2014 Oct;19(10):1085-94. doi: 10.1038/mp.2013.187. Boraska V, Davis OS, Cherkas LF et al. Genome-wide association analysis of eating disorder-related symptoms, behaviors, and personality traits. Am J Med Genet B Neuropsychiatr Genet. 2012;159B(7):803-11. Boraska V, Jeroncic A, Colonna V et al. Genome-wide meta-analysis of common variant differences between men and women. Hum Mol Genet. 2012;1;21(21):4805-15. Boraska V, Day-Williams A, Franklin CS et al. Genome-wide Association Study to Identify Common Variants Associated with Brachial Circumference: a Meta-analysis of 14 Cohorts. PLoS One. 2012;7(3):e31369. Boraska V, Rayner NW, Groves CJ, Frayling TM, Diakite M, Rockett KA, Kwiatkowski DP, Day-Williams AG, McCarthy MI, Zeggini E. Large-scale association analysis of TNF/LTA gene region polymorphisms in type 2 diabetes. BMC Med Genet. 2010;6;11:69
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)	2014. Croatian Foundation for Knowledge, Installation Grant „Genome-wide association analysis of Hashimoto thyroiditis”, Medical School Split 2011 Unity Through Knowledge Fund CONNECTIVITY PROGRAM (“Gaining Experience” Grant 2A) for postdoctoral research project „Establishing novel genetic loci for eating disorder-related traits, brachial circumference and sex” at the Wellcome Trust Sanger Institute, Wellcome Trust Genome Campus, Hinxton, Cambridge, UK 2009-2010 The National Foundation for Science, Higher Education and Technological Development of the Republic of Croatia, BRAIN GAIN- Postdoc fellowship for postdoctoral research project ”Analysis and interpretation of large-scale association studies: application to the 10,001 Dalmatians data” at the Wellcome Trust Sanger Institute, Wellcome Trust Genome Campus, Hinxton, Cambridge, UK
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?	Bachelor of Science (Biology) and PhD program: (Molecular and Cellular Biology), University of Zagreb, Faculty of Mathematics and Natural Sciences
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	2013 Annual Young Scientist Award – Croatian Society for Biochemistry and Molecular Biology (HDBMB)

	2012 ENGAGE (European Network of Genomic and Genetic Epidemiology) Young Investigator - Summer 2012 based on the publication 'Genome-wide meta-analysis of common variant differences between men and women' (Boraska et al., Hum Mol Genet, August 2012) 2006-2008 Scholarship for the best post degree student from the Split municipality 2006/2007 and 2007/2008 2006 Award for the first authorship for the best scientific article from Medical School, University of Split in the year 2005/2006
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)	4.6, Medical Biology (medicine)

First and last name and title of teacher	**Slobodan Brinić, PhD, Associate 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	021 329 475
E-mail address	brinic@ktf-split.hr
Personal web page	http://www.ktf-split.hr/~brinic/
Year of birth	1956.
Scientist ID	181051
Research or art rank, and date of last rank appointment	Research Scientist; 5. October 2012.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Associate professor, 28. November 2012.
Area and field of election into research or art rank	Natural science; Chemistry
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Chemsitry and Technology, University of Split, Croatia
Date of employment	14. August 1990.
Name of position (professor, researcher, associate teacher, etc.)	professor
Field of research	Electrochemistry
Function	Head of Division for Chemistry
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty of Chemical Engineering and Chemistry
Place	Zagreb, Croatia

Date	19. July 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: 1. General chemistry and Inorganic chemistry, University undergraduate study of Chemistry and study of Chemical Technology at Faculty of Chemistry and Chemical Technology, University undergraduate study of Biology and Ecology at University Department of Marine Studies, University of Split 2. Inorganic chemistry, University undergraduate study of Biology and Chemistry at Faculty of Science, University of Split 3. General and Inorganic chemistry, Integrated University undergraduate and graduate study of Pharmacia at University of Split 4. Inorganic chemistry, University graduate study of Conservation and Restoration at Academy of Arts, University of Split 5. General Chemistry I, University undergraduate study of Biology and Chemistry at Faculty of Science and Education, University of Mostar (Bosnia and Herzegovina)
Authorship of university/faculty textbooks in the field of the course	Brinić, Slobodan. „Recenzirana predavanja iz odabranih poglavlja Opće kemije“. Veljača 2012. KTF-Split. 30.1.2014.http://www.ktf-

	split.hr/~brinic/nastava/nast.html Brinić, Slobodan. „Recenzirana predavanja iz odabranih poglavlja Anorganske kemije“ Veljača 2012. KTF-Split. 30.1.2014.http://www.ktf-split.hr/~brinic/nastava/nast.html
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. **S.** Brinić, N. Vladislavić, M. Buzuk, M. Bralić, M. Šolić, Bismuth film random array carbon fiber micro electrodes for determination of cysteine and N-acetyl cysteine, *Journal of Electroanalytical Chemistry,* 705 (2013) 86 2. S. Brinić, M. Bralić, M. Buzuk, M. Bralić, M. Buljac, D. Jozić, Cu (II) Ion-Selective Electrode Based on Mixed Silver-Copper Sulfide: Phase Structure and Electrochemical Properties, International Journal of Electrochemical Science, 7 (6) (2012) 5217 3. S. Brinic, M. Buzuk, M. Bralić, E. Generalić, Solid-contact Cu(II) ion-selective electrode based on 1,2-di-(o-salicyladiminophenylthio)ethane, Journal of Solid State Electrochemistry, 16 (4) (2012), 1333 4. S. Brinic, M. Buzuk, E. Generalić and M. Bralić, Improving the Response of Copper(II) Selective PVC Membrane Electrode by Modification of N2S2 Donor Ligand, Acta Chimica Slovenica, 57 (2010) 318 5. Buzuk, Marijo; Brinić, Slobodan; Generalić, Eni; Bralić, Marija, Copper(II) ion selective PVC membrane electrode based on S, S' bis(2 aminophenyl)ethanebis(thioate), Croatica chemica acta. 82 (2009) , 4; 801-806 .
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 prize of “Society of Engineers and Technicians” Split for the best innovation in 1987., "Device for short discharge of chemical power sources KIS'87".

First and last name and title of teacher	**Assistant professor Vedrana Čikeš Čulić**
The course he/she teaches in the proposed study programme	Medical Chemistry and Biochemistry, Medical Studies in English
GENERAL INFORMATION ON COURSE TEACHER	
Address	Odeska 9
Telephone number	021 316904
E-mail address	vedrana.cikes.culic@mefst.hr
Personal web page	
Year of birth	1976
Scientist ID	272311
Research or art rank, and date of last rank appointment	Scientific collaborator, 31.3.2010.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Assistant professor, 31.3.2010.
Area and field of election into research or art rank	Area: Biomedicine and health; Field: Pharmacy
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	University of Split School of Medicine
Date of employment	1.9.2004.
Name of position (professor, researcher, associate teacher, etc.)	Assistant professor
Field of research	Medical chemistry and biochemistry
Function	Teacher
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty of Pharmacy and Medical Biochemistry, University of Zagreb
Place	Zagreb
Date	16.7.2009.
INFORMATION ON ADDITIONAL TRAINING	
Year	2000/2001
Place	Split, Croatia
Institution	Clinical hospital Split, Department of Medical Laboratory Diagnostics
Field of training	Medical laboratory diagnostcs
Year	September 2009.
Place	Antwerpen, Belgium
Institution	Antwerpen University Hospital, Laboratory of Cellular and Molecular Cardiology
Field of training	EPC (endothelial progenitor cells) analysis, EMP (endothelial microparticles) analysis, EPC culture
Year	29.8.2012. – 1.4.2013.
Place	Baltimore, USA
Institution	Johns Hopkins University
Field of training	Postdoctoral fellow in molecular biology – cancer research
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	Italian, 3

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)	French, 2
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)	- Biochemistry 2, Medical laboratory diagnostics, University Department of Health Studies, Undergraduate Study - Glycobiology of hematopoiesis, Medical laboratory diagnostics, University Department of Health Studies, Undergraduate Study
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. Devenica D, **Cikes Culic V**, Markotic A, Vuica A. Biochemical, patological and oncological relevance of Gb3Cer receptor. Med Oncol (2011): 28(1): 675-684. 2. Rezic-Muzinic N, **Cikes-Culic V**, Bozic J, Ticinovic-Kurir T, Salamunic I, Markotic A. Hypercalcemia induces a proinflammatory phenotype in rat leukocytes and endothelial cells. J Physiol Biochem (2013): 69(2):199-205. 3. Novak A, Rezic Muzinic N, **Cikes Culic V**, Bozic J, Ticinovic Kurir T, Ferhatovic L, Puljak L, Markotic A. Renal distribution of ganglioside GM3 in rat models of types 1 and 2 diabetes. J Physiol Biochem. (2013): 69(4): 727-35. 4. Markic J, Jeroncic A, Polancec D, Bosnjak N, Markotic A, Mestrovic J, **Cikes Culic V**. CD15s is a potential biomarker of serious bacterial infection in infants admitted to hospital. Eur J Pediatr (2013): 172:1363-1369. 5. **Cikes Culic V**, Van Craenenbroeck E, Rezic Muzinic N, Ljubkovic M, Marinovic J, Conraads V, Dujic Z. Effects of SCUBA diving on vascular repair mechanisms. Undersea Hyperb Med (2014): 41:97-104.
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 scientific research project «Pathobiochemistry of glycosphingolipid antigens» no. 216-2160133-0066, Ministry of Science, , **collaborator**
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?	The course of the continuous medical education "Skill of medical education and scientific work" held at the University of Split School of Medicine, 6.-7.2.2009.
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	Croatian Society of Medical Biochemistry Award „Krešo Lipovac" for the best scientific novice for year 2005
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	Average grade: 4,78 (5 is maximum)

First and last name and title of teacher	**Professor, Marija Definis-Gojanović, M.D., Ph.D.**
The course he/she teaches in the proposed study programme	Forensic Pharmacy
GENERAL INFORMATION ON COURSE TEACHER	
Address	Mažuranićevo šet. 10c, Split, Croatia
Telephone number	00 385 346 506
E-mail address	marija.dg@gmail.com
Personal web page	
Year of birth	1960
Scientist ID	207083
Research or art rank, and date of last rank appointment	Scientific researcher, School of Medicine, University of Split, 2011
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Professor, School of Medicine, University of Split, 2011
Area and field of election into research or art rank	Biomedicine and health care, Forensic medicine
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Clinical hospital centre Split; School of Medicine, University of Split, Croatia
Date of employment	1988; 1993
Name of position (professor, researcher, associate teacher, etc.)	Specialist of forensic medicine; professor
Field of research	Forensic medicine
Function	Head of the department
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Specialist of forensic medicine
Institution	Department of Forensic Medicine and Criminalistics, Zagreb University School of Medicine,
Place	Zagreb, Croatia
Date	1993
INFORMATION ON ADDITIONAL TRAINING	
Year	1996; 2000; 2004; 2008
Place	Connecticut, USA; Montpellier, France; Plitvice Lakes, Croatia; Koločep, Croatia
Institution	Office of Chief Medical Examiner; School of Medicine; Croatian Toxicological Society; Island of Knowledge
Field of training	Forensic Medicine; Forensic Anthropology; Forensic Toxicology; Human rights
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)	Languages of ex-Yugoslavia (2-5)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
COMPETENCES FOR THE COURSE	
Earlier experience as course	Forensic medicine, School of Medicine, Split University,

teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)	Croatia, from 1993 – undergraduate study Forensic medicine, School of Medicine, MostarUniversity, BiH, from 2000 – undergraduate study Postgraduate studies at named faculties Forensic pathology, University Department for Forensic Sciences, Split University, Croatia, from 2011– undergraduate study
Authorship of university/faculty textbooks in the field of the course	1. Definis-Gojanović, Marija. Infekcije u ginekologiji i perinatologiji / Karelović, Deni (ur.). Zagreb: Medicinska naklada, 2012., str. 81-97. 2. Definis-Gojanović, Marija. Osnove forenzične toksikologije / Sutlović, Davorka (ur.).Split: Web knjižara, 2011., str. 311-21, 399-441.
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. Sutlović, Davorka; Ščepanović, Antonija; Bošnjak, Marinko; Veršić-Bratinčević, Maja; Definis-Gojanović, Marija. **The role of alcohol in road traffic accidents with fatal outcome : ten-year period in Croatia Split-Dalmatia County**. // *Traffic injury prevention*. **15** (2014) , 3; 222-227 (članak, znanstveni). 2. Sutlović, Davorka; Veršić Bratinčević, Maja; Definis-Gojanović, Marija. **Blood alcohol stability in post mortem blood samples**. // *American journal of forensic medicine and pathology*. **35** (2014) , 1; 55-58 (članak, znanstveni). 3. Bečić, Kristijan; Jandrić Bečić, Darija; Čengija, Morana; Ćurić, Goran; Alujević, Antonio; Definis-Gojanović, Marija. **Croatia is a safe tourist destination – study of foreign citizen mortality in Splitsko-dalmatinska and Primorsko-goranska County during the period 2001-2010**. // *Croatian medical journal*. **54** (2013) , 3; 291-295 (članak, znanstveni). 4. Bečić, Kristijan; Jandrić Bečić, Darija; Definis-Gojanović, Marija; Zekić Tomaš, Sandra; Anterić, Ivana; Bašić, željana. **Bone porosity and longevity in early medieval Southern Croatia**. // *International journal of food sciences and nutrition*. **65** (2013) ; 172-176 (članak, znanstveni). 5. Duraković, Zijad; Mišigoj-Duraković, Marjeta; Škavić, Josip; Definis-Gojanović, Marija. **Unexpected Sudden Death Due to Recreational Swimming and Diving in Men in Croatia in a 14-Year Period**. // *Collegium antropologicum*. **36** (2012) , 2; 641-645 (članak, 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. "Antropološka analiza kostura srednjovjekovne populacije iz južne Hrvatske", No 216-21608000-0799 (2007.2014, main researcher) 2. I-SEE-Project for strenthening information between Italy and South East Europe neighbouring countries on New Psychoactive Substances. (Grant agreement JUST/2013/ISEC /DRUGS/AG/6426 (2015-2016, beneficiary partner)
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-	„International Symposium on the Occasion of 100 Year Anniversary of Abraham Flexner Report - Scientific Approach to Medical Education", School of Medicine, University of Split, 2010

didactic-pedagogical group of competences	
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	1.1983: Chancellor's Award, University of Zagreb (Keleuva S, **Definis M**, Paladino J, Katić Ž. Neuropsihijatrijsko istraživanje bolesnika s kroničnim subduralnim hematomom) 2. 1996.: Young Investigators' Award, XVIIth Meeting of IAFS, Tokio, Japan (**Definis Gojanović M**, Čapkun V. Homicides and suicides in war period in Croatia) 3. 2003., 2005. i 2008.: Awards for the quallity of education according to students' surveys (third and first place), School of Medicine, Split University, Croatia
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)	4.5-4.9

First and last name and title of teacher	**Valerija Dunkić, PhD degree**
The course he/she teaches in the proposed study programme	Pharmaceutical botany
GENERAL INFORMATION ON COURSE TEACHER	
Address	Split, Trondheimska 4 b
Telephone number	021 469 006
E-mail address	dunkic@pmfst.hr
Personal web page	
Year of birth	1967
Scientist ID	210036
Research or art rank, and date of last rank appointment	Senior Research Associate, 19. 12. 2012.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Associate Professor, 19. 12. 2012.
Area and field of election into research or art rank	Natural Sciences, Biology, Botany
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Natural Science, Split
Date of employment	20. 04. 1995.
Name of position (professor, researcher, associate teacher, etc.)	professor
Field of research	Botany and Plant physiology
Function	professor
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Senior Research Associate
Institution	Faculty of Natural Science, Zagreb
Place	Zagreb

Date	27. 04. 2006
INFORMATION ON ADDITIONAL TRAINING	
Year	2004
Place	Zagreb
Institution	Institute Ruđer Bošković, Zagreb
Field of training	electron microscopy
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)	General Botany, with field work and Plant Physiology to study biology and chemistry and nutrition, undergraduate studies at the Faculty of Science, University of Split. General biology of Chemical Technology, University of Split, at the undergraduate and graduate levels.
Authorship of university/faculty textbooks in the field of the course	Bezić, Nada; Dunkić, Valerija; Vuko Elma. Antiphytoviral Activity of Essential Oils of Some Lamiaceae Species and There Most Important Compounds on CMV and TMV // Microbial pathogens and strategies for combating them: science, technology and education / A. Méndez-Vilas (ur.). Badajoz, Spain : Formatex Research Center, 2013. Str. 982-988.
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	Dunkić, Valerija; Mikrut, Antonija; Bezić, Nada. Anti-Legionella Activity of Essential Oil of Satureja cuneifolia. // Natural product communications. 9 (2014) , 5; 713-714. Kremer, Dario; Dunkić, Valerija; Ruščić, Mirko; Matevski, Vlado; Ballian, Dalibor; Bogunić, Faruk; Eleftheriadou, Eleni; Stešević,

	Danijela; Kosalec, Ivan; Bezić, Nada; Stabentheiner, Edith. Micromorphological traits and essential oil contents of Micromeria kerneri Murb. and M. juliana (L.) Benth. (Lamiaceae). // Phytochemistry. 98 (2014) ; 128-136 Dunkić, Valerija; Vuko, Elma; Bezić, Nada; Kremer, Dario; Ruščić, Mirko. Composition and Antiviral Activity of the Essential Oils of Eryngium alpinum and E. amethystinum. // Chemistry & Biodiversity. 10 (2013) , 10; 1894-1902. 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) , 12; 2825-2842. Bezić, Nada; Vuko, Elma; Dunkić, Valerija; Ruščić, Mirko; Blažević, Ivica; Burčul, Franko. Antiphytoviral Activity of Sesquiterpene-Rich Essential Oils from Four Croatian Teucrium Species. // Molecules. 16 (2011) , 9; 8119-8129
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	Mihanović, Frane; Bezić, Nada; Dunkić, Valerija; Vuko, Elma; Matijević, Jurica. Skulptura raspetoga Krista iz lopudske Crkve Gospe od Šunja. // Dubrovnik : časopis za književnost i znanost. 2 (2010) , -; 201-227 (članak, znanstveni).
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	2007- end of 2013 – Xerophytes and their secondary metabolites (Scientific Program Ministry of Science, Education and Sport, Republic of Croatia 177-1191192-0830) - associated leader; Leader: Nada Bezić
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoške kompetencije?	in graduate school professor of biology and chemistry I got the complete methodical and psycho-didactic pedagogical competition is that I hold courses Methodology of biology, Methodology of chemistry, Didactics, Psychology and Pedagogy
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	**Darko Duplančić PhD, associate professor**
The course he/she teaches in the proposed study programme	Pharmaceutical Ethics and Deontology
GENERAL INFORMATION ON COURSE TEACHER	
Address	Prilaz braće Kaliterna 6
Telephone number	00385912507363
E-mail address	darko.duplancic@mefst.hr
Personal web page	
Year of birth	1962
Scientist ID	181400
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	2012 associate professor
Area and field of election into research or art rank	Internal medicine
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	University hospital Split
Date of employment	2001
Name of position (professor, researcher, associate teacher, etc.)	Associate professor
Field of research	Internal medicine-Cardiology
Function	Head of department
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Univarsity of Split School of medicine
Place	Split
Date	2012
INFORMATION ON ADDITIONAL TRAINING	
Year	2006
Place	Zagreb
Institution	KBC Tagreb ZBSKZŽ
Field of training	Interventional cardiology
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)	
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)	
Authorship of university/faculty textbooks in the field of the course	**Jure Mirat,Vedran Ćorić i suradnici - BOLESTI SRČANIH**

	ZALISTAKA **Zdenko Kovač i suradnici Klinička patofiziologija**
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	**Acute application of antioxidants protects against hyperoxia-induced reduction of plasma nitrite concentration.** Vucinovic Z[1], Duplancic D, Seselja-Perisin A, Kukoc-Modun L, Gunjaca G, Radman M, Vukovic J, Tsikas D, Poljak K, Modun D. **Prognostic value of ophthalmic artery color Doppler sonography for progression to glaucoma in vitiligo patients].** [Article in Croatian] Duplancić D[1], Rogosić V, Puizina-Ivić N, Rogosić LV, Luksić B, Kovacić V, Poljak K, Novak-Laus K. **The influence of selective vitamin D receptor activator paricalcitol on cardiovascular system and cardiorenal protection.** Duplancic D[1], Cesarik M, Poljak NK, Radman M, Kovacic V, Radic J, Rogosic V. **Primary percutaneous coronary intervention (pPCI) in hospital without regional cardiac surgery support, data from Split region].** [Article in Croatian] Giunio L[1], Vuković I, Duplancić D, Mirić D, Marković B, Zanchi J, Kristić I.
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	**Mr. sc. Branka Gotovac, lecturer**
The course he/she teaches in the proposed study programme	Mathematics and Statistics
GENERAL INFORMATION ON COURSE TEACHER	
Address	Gorička 4, 21 000 Split
Telephone number	360-046
E-mail address	gotovac@ktf-split.hr
Personal web page	
Year of birth	1964.
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, 23.12.2010.
Area and field of election into research or art rank	
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Chemistry and Technology, University of Split
Date of employment	1.10.1994.
Name of position (professor, researcher, associate teacher, etc.)	Lecturer
Field of research	Mathematics
Function	Head of Mathematics Unit
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Mr. sc.
Institution	Faculty of Science
Place	Split
Date	23.7.2009.

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 (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)	- Mathematics I (University undergraduate study: Chemical Technology, University undergraduate study: Chemistry) - Mathematics II (University undergraduate study: Chemical Technology, University undergraduate study: Chemistry) - Mathematics (Professional study: Chemical Technology)
Authorship of university/faculty textbooks in the field of the course	The internal script
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	• B. Gotovac, *Putovanje Londonom kroz četiri zadatka*, Poučak, Hrvatsko matematičko društvo, Profil International d.o.o., Zagreb, **14 (54)** (2013) 44-55. • B. Gotovac, *Analiza grafa funkcije bez uporabe matematičkog nazivlja-primjer suradničkog učenja u sveučilišnoj nastavi*, Zbornik radova, Druga međunarodna konferencija gimnazija 3K, Pedagoško društvo Vojvodine, Gimnazija "Isidora Sekulić", Novi Sad (2011) 15-24. • B. Gotovac, *Primjena određenog integrala na računanje površine lika u ravnini - Prema nastavi usmjerenoj na studenta*, Poučak, Hrvatsko

	matematičko društvo, Profil International d.o.o., Zagreb, **12 (47)** (2011) 44-56. • B. Gotovac, *Procjena usvojenosti temeljnih znanja i pristupa rješavanju zadataka u elementarnoj matematici*, Zbornik radova, IV. kongres nastavnika matematike Republike Hrvatske, Hrvatsko matematičko društvo, Ministarstvo znanosti, obrazovanja i športa RH, Zagreb, (2010) 189-201.
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	• B. Gotovac, *Analiza grafa funkcije bez uporabe matematičkog nazivlja - Lice i naličje nastavnog sata*, Zbornik radova, V. kongres nastavnika matematike Republike Hrvatske, Hrvatsko matematičko društvo, Ministarstvo znanosti, obrazovanja i športa RH, Zagreb, (2012) 203-220. • B. Gotovac, *Procjena usvojenosti temeljnih znanja i pristupa rješavanju zadataka u elementarnoj matematici prije i poslije uvođenja državne mature-projekcija na obrazovanje*, Poučak, Hrvatsko matematičko društvo, Profil International d.o.o., Zagreb, **12 (45)** (2011) 39-47. • B. Gotovac, *Analizom rezultata testa iz elementarne matematike prema strategiji konstruktivnog upravljanja pogreškama,* Zbornik radova, Prva međunarodna konferencija gimnazija 3K, Savez pedagoških društava Vojvodine, Gimnazija "Isidora Sekulić", Novi Sad (2010) 71-81. • B. Gotovac, *Kritika pristupa nastavi na razini visokoškolskog obrazovanja,* Školski vjesnik, Split, **58 (02)** (2009) 225-232.
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?	During the graduate and postgraduate study.
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	**Prof. dr. sc. Zoran Grubač**
The course he/she teaches in the proposed study programme	General and 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.unist.hr
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	1. Z. Grubač, Lectures from general chemistry, Faculty of

textbooks in the field of the course	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)	6. 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. 7. 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. 8. 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. 9. 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. 10. 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 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 General Chemistry: Average Grade: 4.3 Inorganic Chemistry: Average Grade: 4.3

First and last name and title of teacher	**PhD, Senka Gudić, Full professor**
The course he/she teaches in the proposed study programme	Electroanalytics in Pharmacy
GENERAL INFORMATION ON COURSE TEACHER	
Address	Teslina 10/V, 21000 Split
Telephone number	++385 21 329 433
E-mail address	senka@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 25, 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)
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)	1. Electrochemical engineering, Direct energy conversion – professional study of Chemical technology (Chemical Technology and Materials) 2. Electrochemistry, Chemical sources of energy – undergraduated study of Chemical technology 3. Electrochemical methods and their application, Direct energy conversion - graduated study of Chemical technology (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)	1. 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.** 2. M. Gojić, L. Vrsalović, S. Kožuh, A.C. Kneissl, I. Anžel, S. Gudić, B. Kosec, M. Kliškić, Electrochemical and microstructural study of Cu-Al-Ni shape memory alloy, J. Alloy. Compd. 506 (2011) **9782-9790.** 3. L. Vrsalović, E.E. Oguzie, M. Kliškić, S. Gudić, Corrosion inhibition of CuNi10Fe alloy with phenolic acids, **Chem. Eng. Comm.** 198 (2011) 1380-1393. 4. S. Gudić, I. Smoljko, M. Kliškić, The effect of small addition of tin and indium on the corrosion behaviour of aluminium in chloride solution, J. Alloy. Compd. 505 (2010) 54-63. 5. S. Gudić, I. Smoljko, M. Kliškić, Electrochemical behaviour of aluminium alloys containing indium and tin in NaCl solution, Mater. Chem. Phys. 121 (2010) 561-566.

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	
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	**Ph.D. Igor Jerković, Full Professor**
The course he/she teaches in the proposed study programme	Organic Chemistry I Pharmacognosy
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)	Organic Chemistry I, Organic Chemistry II (undergraduate study), 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	**Sandra Kostić, PhD, MSc in Biotechnology**
The course he/she teaches in the proposed study programme	Human Anatomy and Histology
GENERAL INFORMATION ON COURSE TEACHER	
Address	Šoltanska 2, Split
Telephone number	021 557-810
E-mail address	sandra.kostic@mefst.hr
Personal web page	http://neuron.mefst.hr/docs/znanost/Zavod_anat_hist/Pain/2014-8-01-CV_S_KOSTIC.pdf
Year of birth	1983
Scientist ID	314431
Research or art rank, and date of last rank appointment	Research associate, July 4, 2013
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Adjunct assistant professor, (Branch cytology, histology and embryology, Department of histology and embryology), October 22, 2013.
Area and field of election into research or art rank	Scientific area – Biomedicine and health; Field – Basic medical sciences
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	University of Split, School of Medicine
Date of employment	April 1, 2013
Name of position (professor, researcher, associate teacher, etc.)	Scientific novice /senior research assistant
Field of research	- Pain research (Neuroscience) - Teaching (undergraduate and gradute)
Function	- Head of the Laboratory for Microscopy - Executive editor – Electronic publishing – Croatian Medical Journal - Deputy head of Department of histology and embryology
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	University of Split School of Medicine
Place	Split, Croatia
Date	March 13, 2013.
INFORMATION ON ADDITIONAL TRAINING	
Year	2011-2013
Place	Milwaukee, Wisconsin, USA
Institution	Medical College of Wisconsin, Department of Anesthesiology
Field of training	Research fellow in Electrophysiology (Pain REsearch)
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
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)	- Undergraduate education in **Histology and Embryology:** • Medicine • Dental Medicine • Pharmacy • Medical Studies in English

	• Health Sciences Elective courses: • How to construct your own organ? • The puzzle of pain • Empathy and Pain • The Cochrane Library and Pain • How safe and effective are treatments used in medicine? - Graduate education: • Laboratory animal science • How to construct your own organ? • The puzzle of pain" • Adventures of pain in the brain • Development of human spinal ganglia • Seeing invisible - the world under microscope
Authorship of university/faculty textbooks in the field of the course	Saraga-Babić M, Puljak L, Mardešić S, **Kostić S,** Sapunar D. Embriologija i histologija čovjeka. Sveučilišni odjel zdravstvenih studija, Sveučilište u Splitu, Redak, 2014.
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. Kostic S, Pan B, Guo Y, Yu H, Sapunar D, Kwok WM, Hudmon A, Wu HE, Hogan QH. Regulation of voltage-gated Ca2+ currents by Ca2+/calmodulin-dependent protein kinase II in resting sensory neurons. Mol Cell Neurosci. 2014 Jul 24. pii: S1044-7431(14)00077-3. 2. **Kostic S**, Puljak L, Sapunar D. Attenuation of pain-related behaviour evoked by carrageenan injection through blockade of neuropeptide Y Y1 and Y2 receptors. Europ J Pain. 2013**;17:**493–504 3. Tang Q, Bangaru ML, **Kostic S**, Pan B, Wu HE, Koopmeiners AS, Yu H, Fischer GJ, McCallum JB, Kwok WM, Hudmon A, Hogan QH. Ca2+-Dependent Regulation of Ca2+ Currents in Rat Primary Afferent Neurons: Role of CaMKII and the Effect of Injury. J Neurosci. 2012;32(34):11737-49. 4 Sapunar D, Vukojevic K, **Kostic S**, Puljak L. Attenuation of injury-evoked pain-related behavior by blockade of neuropeptide Y Y2 receptor. Pain 2011;152; 1173-1181. 5 Fisher GJ, **Kostic S**, Nakai H, Park F, Sapunar D, Yu H, Hogan Q. Direct injection into the dorsal root ganglion: Technical, Behavioral and Histological observations. Journal of Neuroscience Methods 2011; 199(1):43-55.
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	1. Sapunar D, **Kostić S,** Banožić A, Ferhatović L, Puljak L. Pain research in Croatia: Analysis of bibliometric trends. Periodicum Biologorum 2011; 113(2):137-140 2. Sapunar D, **Kostic S**, Banozic A, Puljak L. Dorsal root ganglion – a potential new therapeutic target for neuropathic pain. J of Pain Research. J Pain Res. 2012;5:31-8.
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	- UKF 2A travel grant (amount awarded 60.000 kn) - Participation in MZOS grant "Functional analysis of injured primary afferent neurons" - Participation in MZOS program project grant "Nerve injury and neuropathic pain" Participation in NZZ grant „Molecular Memory in Diabetic Neuropathy"
The name of the programme and the volume in which the main	University of Split, School of Medicine – University Educational Course of Educators (Scientific Approach to Medical Education)

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	- The Award for Excellence in Teaching (Histology and embryology teaching, academic year 2012/2013), 2014 - 3rd place at Symposium of Young Scientists, January 26th 2011
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)	From 2010 (started teaching), the students evaluation grades are among the best in the Department of Histology and embryology (ranging from 4.7 to 5,0) - awarded the best teacher award according to the student's evaluation, academic year 2012/2013

First and last name and title of teacher	**Doc. dr. sc. Lea Kukoč Modun**
The course he/she teaches in the proposed study programme	Analytical chemistry I Analitical chemistry II Instrumental methods of analysis in pharmacy
GENERAL INFORMATION ON COURSE TEACHER	
Address	Hrvatske mornarice 1 K
Telephone number	098706693
E-mail address	kukoc@ktf-split.hr
Personal web page	///
Year of birth	1977.
Scientist ID	250621
Research or art rank, and date of last rank appointment	Research associate, 30.03.2012.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Assistant professor, 30.12.2012.
Area and field of election into research or art rank	Natural sciences, chemistry, analytical chemistry
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of chemistry and technology
Date of employment	01.02.2002.
Name of position (professor, researcher, associate teacher, etc.)	Assistant professor
Field of research	analytical chemistry
Function	///
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Ph:D.
Institution	Faculty of Chemical Engineering and Technology
Place	Zagreb

Date	16.10.2009.
INFORMATION ON ADDITIONAL TRAINING	
Godina	2004.
Mjesto	Monza, Italy
Ustanova	Centar Perkin-Elmer
Područje usavršavanja	Atomic absorption spectrometry
Godina	2005.
Mjesto	Graz, Austria
Ustanova	Karl-Franzens Universitat
Područje usavršavanja	Electroanalytical methoda
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
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)	Analytical chemistry I, Undergraduate Study, Chemistry Analitical chemistry II, Undergraduate Study, Chemistry Instrumental methods of analysis, Undergraduate Study, Chemistry and Graduate study Chemical Technology
Authorship of university/faculty textbooks in the field of the course	1. Radić, Njegomir; Kukoč Modun, Lea; Introduction to Analytical Chemistry Part I ; Split : Redak, 2013 2. Radić, Njegomir; Kukoč Modun, Lea; Kinetic Methods of Analysis with Potentiometric and Spectrophotometric Detectors – Our Laboratory Experiences // Analytical Chemistry / Ira S. Krull (ur.).; Rijeka : InTech, 2012. Str. 73-92.
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. Radić, Njegomir; Kukoc-Modun, Lea; Biočić, Maja; Kinetic Spectrophotometric Determination of N-acetyl-L-cysteine based on the reduction of copper(II)-neocuproine reagent; Croatica chemica acta. 86 (2013) 65-71

	2. Kukoc-Modun, Lea; Biočić, Maja; Radić, Njegomir; Indirect method for spectrophotometric determination of ascorbic acid in pharmaceutical preparations with 2, 4, 6-tripyridyl-s-triazine by flow-injection analysis; Talanta. 96 (2012) 174-179 3. Kukoc-Modun, Lea; Plazibat, Ivana; Radić, Njegomir; Flow-injection spectrophotometric determination of N-Acetyl-L-cysteine based on coupled redox-complexation reaction; Croatica chemica acta. 84 (2011) 81-85 4. Kukoc-Modun, Lea; Radić, Njegomir; Novel Kinetic Spectrophotometric Method for Determination of Tiopronin {N-(2-Mercaptopropionyl)-glycine}; Croatica chimica acta. 83 (2010) 189-195 5. Kukoc-Modun, Lea; Radić, Njegomir; Kinetic Spectrophotometric Determination of N-Acetyl-L-cysteine Based on a Coupled Redox-Complexation Reaction; Analytical Sciences. 26 (2010) , 4; 491-495
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 011-0000000-3217: «Determination of tiol compounds using potentiometric sensors and spectroscopy ». MZOS RH from 2007. collaborator
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 Educational Course of Educators, gained knowledge from the following areas of education: methods of teaching, team learning, PBL, Microteaching, Communication skils, Searching of scientific databases.
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	Award for the Hot article in journal Analytical Sciences: “Kinetic Spectrophotometric Determination of N-acetyl-L-cysteine Based on Coupled Redox-Complexation Reaction”
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	Operations in Pharmaceutical Technology
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, researcher, associate teacher, etc.)	Full Professor
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	**Magdy Lučić Lavčević, PhD**
The course he/she teaches in the proposed study programme	Physics for pharmacists
GENERAL INFORMATION ON COURSE TEACHER	
Address	Teslina 10, 21000 Split
Telephone number	+385-21-329-449
E-mail address	malula@ktf-split.hr
Personal web page	
Year of birth	1957
Scientist ID	118 560
Research or art rank, and date of last rank appointment	Senior Research Associate, 2013
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Associate Professor, 2013
Area and field of election into research or art rank	Natural Sciences – field of Physics
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Chemistry and Technology
Date of employment	1982.
Name of position (professor, researcher, associate teacher, etc.)	Professor
Field of research	Experimental physics of condensed matter, Nanoscience and Nanotechnology
Function	Head of Physics Department
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty of Natural Sciences
Place	Zagreb
Date	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-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)	Physics I and Physics II , Study of Chemistry, Study of Chemical Engineering , Study of Ciivil Engineering, graduate levels.
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)	MZOS Project: Nanostructures of metals and metal oxides: Morphology and Properties, 2007-2013. University of Split Project: MEM-SPLIT, 2014-

The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoške kompetencije?	Elective courses on methodology and didactics (2), wthin the study of Physics at the Faculty of Natural Sciences in Zagreb.
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	**Assist. Prof. Dr Aleksandra Marjanović**
The course he/she teaches in the proposed study programme	Quality of natural Medicinal products
GENERAL INFORMATION ON COURSE TEACHER	
Address	Grbavička 59, Sarajevo, Bosna i Hercegovina
Telephone number	+ 387 61 709 562
E-mail address	aca1902@gmail.com
Personal web page	/
Year of birth	1980.
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	assistant professor, 25.09.2013.
Area and field of election into research or art rank	Biomedicine and Health/Pharmacy/Pharmaceutical analysis
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Pharmacy University of Sarajevo
Date of employment	13.10.2003.
Name of position (professor, researcher, associate teacher, etc.)	assistant professor
Field of research	Pharmacy/Pharmaceutical analysis/Toxicological chemistry
Function	/
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Ph. D.
Institution	Faculyt of Pharmacy University of Sarajevo
Place	Sarajevo
Date	13.04.2013.
INFORMATION ON ADDITIONAL TRAINING	
Year	2014.
Place	Oslo, Norway
Institution	Norwegian Institute for Water Research (NIVA)
Field of training	Preparation of biota samples for PAH analysis
Year	2010.
Place	Brno/Czech Republic
Institution	RECETOX-Research centre for toxic compounds in the environment
Field of training	ecotoxicology and environmental chemistry
Year	2009/2010
Place	Sarajevo, B&H
Institution	Institute for Genetic Engineering and Biotechnology (INGEB)
Field of training	cytogenetic methods (Alamar blue test, cytokinesis-block micronucleus assay)
Year	2005-2008
Place	Sarajevo, B&H
Institution	Federal Ministry of Health
Field of training	Specialist degree in toxicological chemistry
Year	2008.
Place	Oslo, Norway

Institution	Norwegian Institute for Water Research (NIVA)
Field of training	instrumental techniques for analysis of POPs in samples from environment and biota
Year	2007.
Place	Sarajevo, B&H
Institution	Bio-Base/TÜV Adria
Field of training	HACCP manager
Year	2006.
Place	Lipice, Slovenia
Institution	Faculty of Chemistry and Chemical Technology, University of Ljubljana
Field of training	Validation of analitical methods
MOTHER TONGUE AND FOREIGN LANGUAGES	
Mother tongue	Bosnian
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)	French, 2
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)	Quality control of drugs-integrated study of Pharmacy at Faculty of Pharmacy University of Sarajevo-participated in realization of practical courses Toxicological chemistry-integrated study of Pharmacy at Faculty of Pharmacy University of Sarajevo
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. Djedjibegovic J., **Marjanovic A.**, Sober M., Sinanovic K. Cadmium Exposure from Food-Important Factors in Risk Assessment. In: Hasanuzzaman M., Fujita M., editors. Cadmium: Characteristics, Sources of Exposure, Health and Environmental Effects. New York: Nova Publishers, 2013; p. 311-341. 2. C. Harman, M. Grung, J. Djedjibegovic, **A. Marjanovic**, M. Sober, K. Sinanovic, E. Fjeld, S. Rognerud, S. B. Ranneklev. Screening for Stockholm Convention persistent organic pollutants in the Bosna River (Bosnia and Herzegovina). Environmental Monitoring and Assesment, 2012; 185(2): 1671-83. 3. J. Djedjibegovic, T. Larssen, A. Skrbo, A. **Marjanovic**, M. Sober. Contents of cadmium, copper, mercury and lead in fish from the Neretva river (Bosnia and Herzegovina) determined by inductively coupled plasma mass spectrometry (ICP-MS). Food Chemistry, 2012; 131 (2): 469-476 4. J. Đeđibegović, **A. Marjanović**, M. Šober, A. Škrbo, K. Sinanović, T. Larssen, M. Grung, E. Fjeld, S. Rognerud.

	Levels of persistent organic pollutants in the Neretva River (Bosnia and Herzegovina) determined by deployment of semipermeable membrane devices (SPMD). Journal of Environmental Science and Health, part B, 2010; 45 (2): 128-136 5. Djedjibegovic J., **Marjanovic A.**, Sober M., Brcaninovic M., Sinanovic K. Determination of Antioxidant Potential of some Traditional Non-Alcoholic Beverages in Bosnia and Herzegovina. Ann Nutr Metab, 2013; 63(suppl1): 1619.
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	1. Šober M., Đeđibegović J., **Marjanović A.** Perspectives and challenges in education of pharmacists. X Symposium of Intercantonal Pharmaceutical Chamber FB&H, April 19th-21st 2013; Book of Abstracts: 19-25. 2. M. Šober, **A. Marjanović**, J. Đeđibegović. Education of pharmacists in Federation of Bosnia and Herzegovina and the role of professional organizations. Vox Pharmaciae, 2010; 1: 4-7.
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	1. Scientific project: Capacity building for local implementation of the Stockholm Convention in BiH (BiHNoPOP). Financed by Norwegian Ministry of Foreign Affairs (2009-2011)-collaborator 2. Scientific project: Cooperation and capacity building on implementation of the Stockholm convention in BiH. Financed by Norwegian Ministry of Foreign Affairs (2012-2014)-collaborator
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	Professor Matko Marušić, MD, PhD
The course he/she teaches in the proposed study programme	Scientific Methodology in Pharmacy
GENERAL INFORMATION ON COURSE TEACHER	
Address	Šoltanska 22, 21000 Split
Telephone number	+385-21-785-062
E-mail address	matko.marusic@mefst.hr
Personal web page	No.
Year of birth	1946
Scientist ID	029254
Research or art rank, and date of last rank appointment	Tenured professor 1997
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Tenured professor 1997
Area and field of election into research or art rank	Basic medical sciences
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	School of Medicine, University of Split, Split, Croatia
Date of employment	1-11-2008
Name of position (professor, researcher, associate teacher, etc.)	Professor
Field of research	Medical education
Function	teacher, researcher
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	University of Zagreb, School of Medicine
Place	Zagreb
Date	1975
INFORMATION ON ADDITIONAL TRAINING	
Year	1976-1978
Place	Oak Ridge, TV, USA
Institution	Oak Ridge National Laboratory
Field of training	immunology
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)	-
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)	Physiology, Immunology, Introduction to Medical Reseach School of medicine, graduate and postgraduate programs
Authorship of university/faculty textbooks in the field of the course	Marušić M. [Immune recognition]. 2nd ed. Zagreb: Jumena,

	1990. Andreis I, Batinić D, Čulo F, Grčević D, Marušić M, Taradi M, Višnjić D. [Immunology]. 6th ed. Zagreb: Medicinska naklada; 2004. Gamulin S, Marušić M, Kovač Z, urednici. [Patophysiology]. 5th ed. Zagreb: Medicinska naklada; 2005. Marušić M, Grčević D, urednici. [Collection of multiple-choice test questions in physiology and immunology]. 4th ed. Zagreb: Medicinska naklada; 2007. Marušić M, urednik. [Introduction to medical reseach]. 4th ed. Zagreb: Medicinska naklada; 2008. Marušić M, editor. Principles of research in medicine. 1st edition. Zagreb: Medicinska naklada; 2008. (ISBN 978-953-176-358-5) Gamulin S, Marušić M, Kovač Z, editors. Pathophysiology. Basic mechanisms of disease. Zagreb: Medicinska naklada; 2013.
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	Pavličević I, Škrabić S, Malički M, Merćep AM, Marušić M, Marušić A. Decisional conflict and vaccine uptake: cross-sectional study of 2012/2013 influenza season in Croatia. **Arch Med Sci**, in press, 2015. Malički M, Jerončić A, Marušić M, Marušić A. Why do you think you should be the author on this manuscript? Analysis of open-ended responses of authors in a general medical journal. **BMC Medical Research Methodology**. 2012, 12:189. http://www.biomedcentral.com/1471-2288/12/189 Hren D, Sambunjak D, Marušić A, Marušić M. Medical students' decisions about authorship in disputable situations: intervention study. **Sci Eng Ethics**. 2012. DOI 10.1007/s11948-012-9358-7. Hren D, Marusic M, Marusic A. Regression of moral reasoning during medical education: combined design study to evaluate the effect of clinical study years. **PLoS ONE**. 2011;6(3):e17406. doi:10.1371/journal.pone.0017406. Sambunjak D, Marušić M. Between forwarding and mentoring: a qualitative study of recommending medical doctors for postdoctoral research abroad. **BMC Medical Education**. 2011, **11:**31doi:10.1186/1472-6920-11-31.
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	Đogaš V, Jerončić A, Marušić A, Marušić M. Medical students' motivation and their promptness for academic cheating: cross-sectional study in Croatia. **BMC Medical Education**. BMC Medical Education. 2014, 14:1048; DOI: 10.1186/s12909-014-0277-y; URL: http://www.biomedcentral.com/1472-6920/14/1048 Marušić A, Malički M, Sambunjak D, Jerončić, Marušić M. Teaching science throughout the six-year medical curriculum:

	Two-year experience from the University of Split School of Medicine, Split, Croatia. Acta Medica Academica. 2014;43(1):50-62. DOI: 10.5644/ama2006-124.100 Marušić M, Mimica M, Mihanović F, Janković S. Doctoral degree in health professions: Professional needs and legal requirement. Acta Medica Academica. 2013;42(1):61-70. DOI: 10.5644/ama2006-124.72 Mrduljaš-Đuić N, Žitnik E, Pavelin Lj, Bačić D, Boljat M, Vrdoljak D, Pavličević I, Radica Dvornik A, Marušić A, Marušić M. Writing letters to patients as an educational tool for medical students. **BMC Medical Education**. 2013;13:114. DOI: 10.1186/1472-6920-13-114. URL: http://www.biomedcentral.com/1472-6920/13/114. Marušić A, Sambunjak D, Jerončić A, Malički M, Marušić M. No health research without education for research – experience from an integrated course in undergraduate medical curriculum. **Medical Teacher**. 2013;35:609. (doi:10.3109/0142159X.2013.772969).
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	Influence of Croatian Medicil Journal upon Croatian medical community. 2000-2015. Project code 216-1080314-0245. Marušić A, Marušić M. Can small journals provide leadership? **Lancet** 2012;379:1361-3. doi:10.1016/S0140-6736(11)61508-0 Marušić A, Marušić M. When a disaster strikes: two editors in war. **MJA**. 2012:197(2):118-20. Marušić M, Marušić A, King R. 3.3: Establishing a new journal. In: Smart P, Maisonneuve H.', Polderman A, editors. Science Editors' Handbook. 2nd edition. London: European Association of Science Editors (www.ease.org.uk). 2013. p. 103-106. ISBN 978-0-905988-11-5. Marušić M, Marušić A. 3.5: Organizing the editorial board and office. In: Smart P, Maisonneuve H.', Polderman A, editors. Science Editors' Handbook. 2nd edition. London: European Association of Science Editors (www.ease.org.uk). 2013. p. 111-116. ISBN 978-0-905988-11-5. Marušić A, Marušić M. 3.6: Scientific authorship. In: Smart P, Maisonneuve H.', Polderman A, editors. Science Editors' Handbook. 2nd edition. London: European Association of Science Editors (www.ease.org.uk). 2013. p. 117-120. ISBN 978-0-905988-11-5. Marušić M, Marušić A. The *Croatian Medical Journal*: success and consequences. In: Bennet K, editor. The Semi-periphery of academic writing: discourses, communities and practices. 2014, p. 2010-20.
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?	None.

PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	1970 University of Zagreb Student Award for Best Student 1970 Jure Banovic Award for Best Medical Student 1994 Award of the Croatian Council of European Movement, for international cooperation 1998 Croatian National Award for scientific discovery (of the lifetime function of human thymus) 1998 "Josip Juraj Strossmayer" Award of the Croatian Academy of Sciences and Arts, for the "Pathophysiology" textbook 2000 President of Croatia Decoration of *Danica Hrvatska* Order with Rugjer Boskovic for the overall contribution to science 2005 State Award for Promotion of Science
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	**Full Professor Marica Medić-Šarić PhD.**
The course he/she teaches in the proposed study programme	Drug Biochemistry Pharmaceutical Chemistry 1
GENERAL INFORMATION ON COURSE TEACHER	
Address	Koellerova 2, 10000 Zagreb, Croatia
Telephone number	+ 385 98 37 65 22
E-mail address	mmsbeba@gmail.com
Personal web page	
Year of birth	1949
Scientist ID	74265
Research or art rank, and date of last rank appointment	Scientific advisor, 2001.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Full Professor, 2005.
Area and field of election into research or art rank	Biomedicine & Health, Pharmacy
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	
Date of employment	
Name of position (professor, researcher, associate teacher, etc.)	
Field of research	
Function	
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD.
Institution	University of Zagreb, Faculty of Pharmacy and Biochemistry
Place	10000 Zagreb
Date	1986
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)	French, 5
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	German, 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)	1. "Biochemistry of Drugs", graduate study Faculty of Pharmacy and Biochemistry, Department of Medicinal Chemistry, University of Zagreb, Croatia 1989-present

	2. "Pharmaceutical chemistry", graduate study Faculty of Pharmacy and Biochemistry, Department of Medicinal Chemistry, University of Zagreb, Croatia 1989-present 3. "Biochemical basis of toxicity of endobiotic and xenobiotics", graduate study Faculty of Pharmacy and Biochemistry, Department of Medicinal Chemistry, University of Zagreb, Croatia 2007-present 4. "Drug Design", graduate study Faculty of Pharmacy and Biochemistry, Department of Medicinal Chemistry, University of Zagreb, Croatia 2007-present 5. "Preclinical and clinical studies of natural and synthetic drugs", postgraduate doctoral study, Faculty of Pharmacy and Biochemistry, Department of Medicinal Chemistry, University of Zagreb, Croatia 2008-present 6. "Modeling of new drugs" postgraduate doctoral study, Faculty of Pharmacy and Biochemistry, Department of Medicinal Chemistry, University of Zagreb, Croatia 2008-present 7. "Drug metabolism and toxicity", postgraduate specialistic study Clinical Pharmacy, Faculty of Pharmacy and Biochemistry, Department of Medicinal Chemistry, University of Zagreb, Croatia 2010-present 8. "Design of new drugs", postgraduate specialistic study Drug Development, Faculty of Pharmacy and Biochemistry, Department of Medicinal Chemistry, University of Zagreb, Croatia 2010-present 9. "OTC drugs", postgraduate specialistic study Drug Development, Faculty of Pharmacy and Biochemistry, Department of Medicinal Chemistry, University of Zagreb, Croatia

	2010-present 10. "Vitamins and minerals in metabolic reactions" postgraduate specialistic study Phytopharmacy with Dietotherapy, Faculty of Pharmacy and Biochemistry, Department of Medicinal Chemistry, University of Zagreb, Croatia 2010-present 11. "Molecular modeling" postgraduate doctoral study, Faculty of Pharmacy, Department of Pharmaceutical Chemistry, University of Sarajevo, Bosnia and Herzegovina 2005-present 12. "Pharmaceutical chemistry" graduate study Faculty of Pharmacy, University of Split, Croatia 2010 - present 13."Pharmaceutical chemistry" graduate study Faculty of Pharmacy, University of Mostar, Bosnia and Herzegovina 2013-present 14. "Biochemistry of Drugs"" graduate study Faculty of Pharmacy, Department of Pharmaceutical Chemistry, University of Split, Croatia 2014-present 15. "Biochemistry of Drugs"" graduate study Faculty of Pharmacy, University of Mostar, Bosnia and Herzegovina
Authorship of university/faculty textbooks in the field of the course	1. S. Rendić, M. Medić-Šarić, Metabolizam lijekova i odabranih ksenobiotika, M. Medić-Šarić (ur.), Medicinska naklada, Zagreb 2013. (university textbook) 2. M. Medić-Šarić, Farmaceutska kemija 1, Farmaceutsko-biokemijski fakultet Sveučilišta u Zagrebu, 2008. (faculty textbook) - revised edition 2010. - revised edition 2012. - revised edition 2014.

	3. M. Kaštelan-Macan, M. Medić-Šarić, S. Turina, Plošna kromatografija, Farmaceutsko-biokemijski fakultet Sveučilišta u Zagrebu, Zagreb 2003. (university textbook) 4. Medić-Šarić M, Analgetici, antipiretici i protuupalni lijekovi, u: Bol i suzbijanje boli, Farmaceutsko-biokemijski fakultet Sveučilišta u Zagrebu, Zagreb 2002, str. 33-59. ISBN 953-6265-39-8. 5. Medić-Šarić M, Slobodni radikali u metabolizmu lijekova, u: Oksidativni stress I djelotvornost antioksidansa, V. Bradamante, Z. Lacković (ur), Medicinska naklada, Zagreb 2001, str. 66-84. 6. Medić-Šarić M, Važnost vitamina D i kalcija i nastanku i liječenju osteoporoze, u: Osteoporoza, Farmaceutsko-biokemijski fakultet Sveučilišta u Zagrebu, Zagreb 2001, str. 41-50. ISBN 953-6256-34-7 7. Medić-Šarić M, Buhač I, Bradamante V, Vitamini i minerali – istine i predrasude, F. Hoffmann La Roche, Zagreb 2000. [ISBN 953- 98393-0-0]. 8. Medić-Šarić M, Značaj poznavanja interakcija između vitamina i lijekova, u: Interakcije lijekova, Farmaceutsko-biokemijski fakultet Sveučilišta u Zagrebu, Zagreb 1999, str. 23-29. **More information about authors' scientific contributions could be found at:** **http://biblio.irb.hr/lista-radova?autor=74265**
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. Barbarić M, Mišković K, Bojić M, Baus Lončar M, Smolčić-Bubalo A, Debeljak Ž, Medić-Šarić M. (2011) Chemical composition of the ethanolic propolis extracts and its effect on HeLa cells. J Ethnopharmacol 135:772-8. 2. Bojić M, Debeljak Ž, Tomičić M, Medić-Šarić M, Tomić S. (2011) Evaluation of Antiaggregatory Activity of Flavonoid Aglycone Series. Nutr J 10:68-73. 3. Bojić M, Debeljak Ž, Medić-Šarić M, Tomičić M. (2012) „Interference of selected flavonoid aglycons in platelet

	aggregation assays" Clin Chem Lab Med 50:1403-1408. 4. Medić-Šarić M, Bojić M, Rastija V, Cvek J. (2013) Polyphenol Profiling of Croatian Propolis and Wine. Food Technol Biotechnol. 51:159-170. 5. Vinković Vrček I, Vitali Čepo D, Rašić D, Peraica M, Žuntar I, Bojić M, Mendaš G, Medić-Šarić M. (2014) A comparison of the nutritional value and food safety of organically and conventionally produced wheat flours. Food Chem 143:522-529. **More information about authors' scientific contributions could be found at:** **http://biblio.irb.hr/lista-radova?autor=74265**
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 leader 2013-2014 Structural basis of flavonoids responsible for the distribution and metabolic interactions and Antiaggregation effect (SOFIA), project leader, University of Zagreb, Croatia 2006 – present, scientific project "Biologically active compounds, metabolites and QSAR", project leader, Ministry of Science, Education and Sports (MZOS) 2002 – 2005 "Biologically active compounds and QSAR", project leader, Ministry of Science, Education and Sports (MZOS) 2001-2003 Ministry of Science and Technology, Republic of Croatia "Medical Herbs - Biologically active compounds, metabolites and QSAR", project leader, Ministry of

	Science, Education and Sports (MZOS) <u>Consultant on the project</u> 2013 – 2014 "The application of green chemistry in the development and synthesis of biologically active xanthene and biscoumarins", consultant on the project, Federal Ministry of Education and Science of Culture, Bosnia and Herzegovina
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?	Education and exams, 1980.
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	**Dr.sc. Arijana Meštrović, MPharm, lecturer**
The course he/she teaches in the proposed study programme	Pharmaceutical care and self-medication Social pharmacy
GENERAL INFORMATION ON COURSE TEACHER	
Address	Dunjevac 2, Zagreb 10 000
Telephone number	0916307116
E-mail address	arijana.mestrovic@pharmaexpert.hr
Personal web page	www.pharmaexpert.hr
Year of birth	1971.
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, Biomedicine and heatlhcare, Field of pharmacy 13.11.2014.
Area and field of election into research or art rank	Biomedicine and heatlhcare
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Pharma Expert
Date of employment	05/2013
Name of position (professor, researcher, associate teacher, etc.)	Head of Education
Field of research	Pharmacy
Function	Consultant
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	University of Zagreb, Faculty of Pharmacy
Place	10 000 Zagreb
Date	16.03.2012.
INFORMATION ON ADDITIONAL TRAINING	
Year	2015
Place	Chicago
Institution	American College for Clinical Pharmacy
Field of training	Ambulatory Care
Year	2013
Place	Washington DC, SAD
Institution	Accreditation Council of Pharmacy Education
Field of training	Training for On-site evaluation – International certification of Schools of pharmacy
Year	2009
Place	Glasgow, Scotland
Institution	Strahclide University
Field of training	Pharmaceutical care
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

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)	• Pharmaceutical care, Undergraduate programme, Faculty of Pharmacy, University of Zagreb • Patient Care in Clinical Pharmacy, International Pharmacy PhD Programme, Faculty of Pharmacy, Near East University, Northen Cyprus
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. Meštrović A, Staničić Z, Bates I, Ortner M, Mucalo I, Duggan C, Carter S, Bruno A. Evaluation of Croatian Community Pharmacists' Patient Care Competencies Using the General Level Framework. Am J Pharm Educ 2011; 75 (2): 36. 2. Meštrović A, Staničić Z, Bates I, Ortner M, Mucalo I, Duggan C, Carter S, Kosicek M, Bruno A. Individualized Education and Competency Development of Croatian Community Pharmacists Using the General Level Framework. Am J Pharm Educ 2012; 76 (2): 23. 3. Čulig J, Leppe M, Bošković J, Meštrović A. The Impact of Pharmacist on Patient's Adherence to Medication. Pharmacoepidemiology and Drug Safety 2011; 20(1): 365-382. 4. Meštrović A. Are we Competent in Pharmacy Practice? What are Pharmacist Competencies and How can they be Measured and Developed? Adv Pharmacoepidem Drug Safety 2012: 1:116.
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	International Pharmaceutical Federation. Quality Assurance of Pharmacy Education: the FIP Global Framework. 2nd Ed .The Hague, The Netherlands: International Pharmaceutical Federation (FIP); 2014.
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	1. ACPE (Accreditation Council of Pharmacy Education) – International QA standards 2. FIP (Pharmaceutical International Federation) –QA in Pharmacy Education Framework – new Pillars and foundadtions of quality 3. Ask the patient -Department of Pharmacotherapy and Pharmaceutical Care, University of Groningen 4. Pharmaceutical care for patients with intelectual disabilities – Trinity college Dublin 5. Competency list for students – Near East University of Northen Cyprus - Nicosia
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?	Docenture course – Education and research skills, 10.-12.04.2014. Split, Faculty of Medicine
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	2011 Croatian Pharmaceutical Society Award for improvement in pharmacy practice

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	Physical 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	**Assoc. Professor Darko Modun, MD. Ph.D.**
The course he/she teaches in the proposed study programme	General Pharmacology Special Pharmacology II
GENERAL INFORMATION ON COURSE TEACHER	
Address	Hrvatske mornarice 1K, 21000 Split
Telephone number	098892373
E-mail address	darko.modun@mefst.hr
Personal web page	///
Year of birth	1975.
Scientist ID	243656
Research or art rank, and date of last rank appointment	Scientific advisor, 13.11.2013.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Associate Professor, 08.06.2011.
Area and field of election into research or art rank	Biomedicine & Health, Basic medical sciences
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	University of Split School of Medicine
Date of employment	10/1999
Name of position (professor, researcher, associate teacher, etc.)	Associate Professor
Field of research	Pharmacology, Pharmacy
Function	Vice-Dean, Head of Department
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Ph:D.
Institution	University of Split School of Medicine
Place	21000 Split
Date	20.10.2006.
INFORMATION ON ADDITIONAL TRAINING	
Year	2009.
Place	Hannover, Germany
Institution	Hannover Medical Faculty
Field of training	Detection of nitrite (metabolite of NO) in blood and plasma
Year	2007.
Place	Zagreb
Institution	Institute Rudjer Boskovi
Field of training	Methods of detection of oxidative stress
Year	2002.
Place	Ljubljana
Institution	University of Ljubljana School of Medicine
Field of training	Experimental models in cardiovascular pharmacology
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
COMPETENCES FOR THE COURSE	
Earlier experience as course teacher of similar courses (name	General pharmacology, integrated undergraduate and graduate study of Pharmacy in Split

title of course, study programme where it is/was offered, and level of study programme)	
Authorship of university/faculty textbooks in the field of the course	1. Handbook of virtual experiments in Pharmacology (Priručnik o virtualnim pokusima iz farmakologije) (co-editor and co-author). Split : University of Split School of Medicine (ed.), 2013. 2. Basic and Clinical Pharmacology (Temeljna i klinička farmakologija) (translator of a chapter) Zagreb : Medicinska naklada (ed.), 2011. 3. Handbook of Pharmacology (Farmakološki priručnik) (co-author). Zagreb : Medicinska naknada, (ed.), 2008.
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	6. Vucinovic Z, Duplancic D, Seselja-Perisin A, Kukoc-Modun L, Gunjaca G, Radman M, Vukovic J, Tsikas D, Poljak K, **Modun D.** Acute application of antioxidants protects against hyperoxia-induced reduction of plasma nitrite concentration. *Clin Physiol Funct Imaging.* 2015; 35:76-80' 7. **Modun D**, Krnic M, Vukovic J, Kokic V, Kukoc-Modun L, Tsikas D, Dujic Z. Plasma nitrite concentration decrease after hyperoxia-induced oxidative stress in healthy humans. *Clin Physiol Funct Imaging*. 2012; 32:404-8. 8. Tsikas D, Flentje M, Niemann J, Böhmer A, **Modun D**. Antioxidants and Endothelial Dysfunction in Young and Elderly People: Is FMD Useful to Assess Acute Effects? *Hypertension*. 2012; 60:e5. 9. Krnic M, **Modun D**, Budimir D, Gunjaca G, Jajic I, Vukovic J, Salamunic I, Sutlovic D, Kozina B, Boban M. Comparison of acute effects of red wine, beer and vodka against hyperoxia-induced oxidative stress and increase in arterial stiffness in healthy humans. *Atherosclerosis*. 2011; 218:530-5. 10. Boban M, **Modun D**. Uric acid and antioxidant effects of wine. *Croat Med J*. 2010; 51:16-22.
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)	6. Scientific project Cardiovascular effects of wine and its compounds, collaborator 7. Erasmus teacher mobility, professional visit to Ljubljana, Slovenia 8. Erasmus teacher mobility, professional visit to Kuopio, Finland
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	Award of the University of Split School of Medicine for the first

scholarly/artistic work	author of the best scientific article published in acad. year 2005/06.
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 Olivera Politeo, Associate Professor**
The course he/she teaches in the proposed study programme	General Biochemistry
GENERAL INFORMATION ON COURSE TEACHER	
Address	Teslina 10
Telephone number	385 21 329 437
E-mail address	olivera@ktf-splt.hr
Personal web page	
Year of birth	1969
Scientist ID	259103
Research or art rank, and date of last rank appointment	research scientist, 18.12.2013.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Associate Professor 05.02.2014.
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
Date of employment	01.12.2003.
Name of position (professor, researcher, associate teacher, etc.)	Associate Professor, Department of Biochemistry
Field of research	Biochemistry, Natural Product Research
Function	Associate Professor, Department of Biochemistry
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty of Natural Science, Zagreb
Place	Zagreb, Croatia
Date	09.03.2007.

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)	Biochemistry (Graduate Study - Chemical Technology), Biochemistry I (Undergraduated Study - Chemistry), Biochemistry II (UGS - Chemistry), Biochemistry (University Department of Health Studies), Introduction to Molecular Biology (GS - Chemistry)
Authorship of university/faculty textbooks in the field of the course	"Biokemijski praktikum"
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. **Olivera Politeo**, Mirjana Skocibusic, Franko Burcul, Ana Maravic, Ivana Carev, Mirko Ruscic, Mladen Milos. *Campanula portenschlagiana Roem. et Schult.: Chemical and Biological Profile*. Chemistry & biodiversity **10**, 2013, 1072-1080.. 2. Laura Siracusa, Tea Kulisic-Bilusic, **Olivera Politeo**, Ingolf Krause, Branka Dejanovic, Giuseppe Ruberto. *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 **59,** 2011, 12453-12459. 3. Klaudija Carović-Stanko, Zlatko Liber, **Olivera Politeo**, Frane Strikić, Ivan Kolak, Mladen Milos, Zlatko Satovic. *Molecular and chemical characterisation of the most widespread Ocimum species.* Plant Systematics and Evolution **294,** 2011, 253-262. 4. Zlatko Liber, Klaudija Carović-Stanko, **Olivera Politeo**, Frane Strikić, Ivan Kolak, Mladen Milos, Zlatko Satovic. *Chemical*

	Characterisation and Genetic Relationships among Ocimum basilicum L. Cultivars. Chemistry & Biodiversity **8,** 2011, 1978-1989. 5. **Olivera Politeo**, Mirjana Skocibusic, Ana Maravic, Mirko Ruscic, Mladen Milos. *Chemical Composition and Antimicrobial Activity of the Essentail Oil of Endemic Dalmatian Black Pine (Pinus nigra subsp. Dalmatica).*Chemistry & Biodiversity **8,** 2011, 540-547.
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)	Antioxidant compounds and inhibitors of cholinesterase from aromatic plants
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?	Graduate Study, Chemistry and Biology (Faculty of Natural Science, Split, Croatia)
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	**Mate Portolan, MPharm, lecturer**
The course he/she teaches in the proposed study programme	Introduction to pharmacy
GENERAL INFORMATION ON COURSE TEACHER	
Address	Borisa Papandopula 29
Telephone number	0992007905
E-mail address	mate.portolan@st.t-com.hr
Personal web page	///
Year of birth	1957
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	Teaching rank - lecturer, 09/2011.
Area and field of election into research or art rank	Biomedicine & Health, field of Pharmacy,
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Pharmacy of Split-Dalmatia County, Split
Date of employment	06/1982
Name of position (professor, researcher, associate teacher, etc.)	Deputy Director for Proffesional Affairs and Development
Field of research	Pharmacy
Function	Deputy Director
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Master of Pharmacy
Institution	University of Zagreb, Croatia, Faculty of Pharmacy and Biochemistry
Place	Zagreb
Date	04.03.1980.
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)	
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. Mate Portolan, *New contract models in pharmacy practice*, Bilten HLJK, 9:1/2 (2014), 37-48, 2. Mate Portolan, *Review of CHIF´s business in 2013*, Bilten HLJK, 9:1/2 (2014), 49-58, 3. Mate Portolan, *Diagnostic therapeutic procedures in pharmacy practice*, Bilten HLJK, 9:3/4 (2014), 105-121, 4. **Mate Portolan**, Danijela Jonjić, Aleksandra Grundler, *Pharmacy practice: pharmacists in patient care*, HLJK, 6:(2011), 1-92, 5. Mate Portolan, *Prescribing and dispensing of prescription medicines*, Bilten HLJK, 6:1/2 (2011), 70-72,
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	**Prim. prof. Neira Puizina-Ivić, Ph.D, full prof.**
The course he/she teaches in the proposed study programme	Cosmetology
GENERAL INFORMATION ON COURSE TEACHER	
Address	Mihanovićeva 34 c
Telephone number	00 385 21 315 152
E-mail address	neira.puizina@kbsplit.hr; neira@radogost.com
Personal web page	no
Year of birth	1957.
Scientist ID	141982
Research or art rank, and date of last rank appointment	research scientist, ; 5. 2. 2014.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	full professor; 6. 3. 2014.
Area and field of election into research or art rank	area biomedicine and health, field clinical medical science
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	1. University Hospital Center Split 2. University of Split School of Medicine
Date of employment	1. 1986.. 2. 30.5.2005..
Name of position (professor, researcher, associate teacher, etc.)	1. Medical doctor- specialist 2. Professor
Field of research	Dermatovenerology
Function	1. Deputy head of Clinic of dermatovenerology 2. Head of Department of dermatovenerology
INFORMATION ON EDUCATION – Highest degree earned	
Degree	- specialist of dermatovenerology - subspecialist of dermatologic oncology
Institution	Clinic of dermatovenereology Clinical Hospital and School of Medicine University Zagreb
Place	Zagreb
Date	1998-1990.
INFORMATION ON ADDITIONAL TRAINING	
Year	2005.
Place	Graz, Austria
Institution	University Clinic Graz, Clinic of dermatovenerology
Field of training	dermatology dermatologic oncology dermatohistopathology
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)	german (3)
COMPETENCES FOR THE COURSE	

Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)	none
Authorship of university/faculty textbooks in the field of the course	1. **Puizina-Ivić N**. Definicija tumora i karcinogeneza. U: Lipozenčić J, Pašić A i sur. Dermatološka onkologija. Zagreb: Medicinska naklada, 2009:11-26. 2. **Puizina-Ivić N**. Kožne bolesti. U: Čulić V, Čulić S. Sindrom Down. Split: Naklada Bošković, 2009: 167-187. 3. **Puizina-Ivić N**. Hereditarni angioedem. U: Šimić D i Hadžigrahić N: Hitna stanja u dermatologiji. Sarajevo: Bosnalijek, 2011:25-32. 4. **Puizina-Ivić N**. Poremećaji pigmentacije kao posljedica upalnih dermatoza. U: Šitum M: Poremećaji pigmentacije. Zagreb: Naklada Slap, 2011: 37-44. 5. **Puizina-Ivić N**. Učinci kemijskih pilinga na poremećaje pigmentacije. U: Šitum M: Poremećaji pigmentacije. Zagreb: Naklada Slap, 2011: 131-141. 6. **Puizina-Ivić N**. Atopijski dermatitis. U: Pavlov N, Čulić S, Miše K: Alergijske bolesti. Split: KBC Split, 2010: 19-27 7. **Puizina-Ivić N**. Scabies. U: Krelović D. i sur: Infekcije u ginekologiji i perinatologiji. Zagreb: Medicinska naklada, 2012: 591-595. 8. **Puizina–Ivić N**. Bolesti vezivnoga tkiva. U: Šitum M. i sur: Smjernice u dijagnostici i liječenju najčešćih dermatoza i tumora kože. Zagreb: Naklada Slap, 2012: 97-1 9. **Puizina-Ivić N**, Čarija A, Mirić – Kovačević L,

	Vuković D. Drugs and chemical compounds as initiators and promoters of skin tumors. U: Lipozenčić J and co-authors: Update in dermatologic drug therapy. Zagreb: Academy of Medical Sciences of Croatia, 2012: 79 – 89. 10. Kaštelan M, **Puizina-Ivić N**, Čeović R, Jukić Z, Bulat V, Simonić V, Prpić Massari L, Brajac I, Krnjević Pezić G. Smjernice Hrvatskog dermatovenerološkog društva za dijagnostiku i liječenje vulgarne psorijaze. Zagreb: Hrvatsko dermatovenerološko Društvo Hrvatskog liječničkog zbora, 2013: 158.
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. Miše K, Goić-Barišić I, **Puizina-Ivić N**, Barišić I, Tonkić M, Perić I. A rare case of pulmonary tuberculosis with simultaneous pulmonary and skin sarcoidosis: a case report. Cases Journal 2010; 3:24-28. 2. Rogošić V, Bojić L, **Puizina-Ivić N**, Vanjaka-Rogošić L, Titlić M, Kovačević D, Duplančić D, Sapunar D, Đogaš Z. Vitiligo and glaucoma-an association or a coincidence? A pilot study. Acta Dermatovenerol Croat 2010; 18(1):21-26. 3. Kopriva I, Peršin A, **Puizina-Ivić N**, Mirić L. Robust demarcation of basal cell carcinoma by dependent component analysis-based segmentation of multi-spectral fluorescence image, II J Photochem Photobiol B: Biology 2010; 100: 10-18. 4. **Puizina-Ivić N**, Mirić L, Čarija A, Karlica D, Marasović D. Modern approach to topical treatment of aging skin. Coll. Antropol. 2010; 3

	:1145-1153 5. **Puizina-Ivić N**, Murat-Sušić S, Husar K, Kotrulja L, Mirić L. Poremećaji pigmentacije. Paediatr Croat 2011:55 (Supl 1): 270-281 6. Mirić Kovačević L, **Puizina – Ivić N**, Ljutić D, Mardešić- Brakus S, Kalibović Govorko D, Jeličić I, Mirić D, Rešić J, Saraga-Babić M. Differences in epidermal thickness and expression of apoptosis regulatory proteins in the skin of patients with chronic renal failure and pruritus. Acta histochemica 2012; 115:144-150 7. Kaštelan, M, **Puizina-Ivić N**, Čeović R, Jukić Z, Bulat V, Simonić E, Prpić-Massari L, Brajac I, Krnjević-Pezić G. Smjernice za dijagnostiku i liječenje vulgarne psorijaze. Liječnički Vjesn 2013; 135: 195-200. 8. Vanjaka-Rogošić L, **Puizina-Ivić N**, Mirić L, Rogošić V, Kuzmić-Prusac I, Saraga Babić M, Vuković D, Snježana Mardešić-Brakus. Matrix metalloproteinases and E-cadherin immunoreactivity in different basal cell carcinoma histological types. Acta histochemica 2014; 116(5): 688-693.
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	none
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	Project manager (February 2007 - June 2010.) Fotodynamic therapy in dermatologic oncology /project MZOS/project code 141-210056-0481.
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	none

kompetencije?	
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	none
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)	currently data unavailable (should be taken by the Split University)

First and last name and title of teacher	**PhD, Ani Radonić, Associate professor**
The course he/she teaches in the proposed study programme	Organic Chemistry II Pharmacognosy
GENERAL INFORMATION ON COURSE TEACHER	
Address	Teslina 10/V, 21000 Split
Telephone number	++385 21 329 436
E-mail address	radonic@ktf-split.hr
Personal web page	/
Year of birth	1966.
Scientist ID	3119068
Research or art rank, and date of last rank appointment	Research Scientist; March 30th, 2012.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Associate Professor; May 24th, 2012.
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, University of Split
Date of employment	October 1st, 1992.
Name of position (professor, researcher, associate teacher, etc.)	Associate professor
Field of research	- Essential oils-free volatile compounds: monoterpenes, sesquiterpenes, phenylpropanoids; isolation methods; fractionation methods of complex volatile isolates; analysis of volatile isolates by gas chromatography-mass spectrometry (GC-MS) - Glycosidically bound volatile compounds - water-soluble, non-volatile aroma precursors: methods of isolation, purification and hydrolysis (enzymatic, acid); identification of aglycones by GC-MS - Evaluation of antioxidant activity of free volatile compounds (essential oils) using different methods: radical scavenging method (DPPH method), β-carotene bleaching method, thiobarbituric acid method (TBA method) and method for determination of oxidative stability (Rancimat method) - Glucosinolates (thioglucosides) and their degradation

	products from wild-growing *Brassicaceae* plants: methods of isolation and degradation (thermal degradation, enzymatic degradation); analysis of liberated volatile degradation products by GC-MS; research of volatile degradation products biological activity: testing of antioxidant activity by radical scavenging method (DPPH method); evaluation of antimicrobial activity by the disc-diffusion method and microdilution method (MIC method) in cooperation with Department of Biology, Faculty of Natural Science, University of Split
Function	Head of Department of Organic Chemistry
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty of Chemistry and Technology, University of Split
Place	Split
Date	September 14th, 2005.
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	1. Undergraduate study of chemistry: Organic chemistry I, Organic chemistry II, Natural products, Perfumes and cosmetics 2. Graduate study of Chemistry:

study programme)	Synthesis of biologically active compounds 3. Professional study of Chemical technology: Fundamentals of organic chemistry
Authorship of university/faculty textbooks in the field of the course	I. Jerković, A. Radonić, Praktikum iz organske kemije, Udžbenici Sveučilišta u Splitu, Split, 2009.
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. I. Blažević, A. Radonić, M. Skočibušić, G. R. De Nicola, S. Montaut, R. Iori, P. Rollin, J. Mastelić, M. Zekić A. Maravić, Glucosinolate Profiling and Antimicrobial Screening of *Aurinia leucadea (Brassicaceae)*, *Chem. Biodivers.* 8 (2011) 2310-2321. 2. A. Radonić, I. Blažević, J. Mastelić, M. Zekić, M. Skočibušić, A. Maravić, Phytochemical Analysis and Antimicrobial Activity of *Cardaria draba* L. Desv. volatiles, *Chem. Biodivers.* 8 (2011) 1170-1181. 3. I. Blažević, A. Radonić, J. Mastelić, M. Zekić, M. Skočibušić, A. Maravić, Hedge Mustard (*Sisymbrium officinale*): Chemical Diversity of Volatiles, and Their Antimicrobial Activity, *Chem. Biodivers.* 7 (2010) 2023-2034. 4. I. Blažević, A. Radonić, J. Mastelić, M. Zekić, M. Skočibušić, A. Maravić, Glucosinolates, glycosidically bound volatiles and antimicrobial activity of *Aurinia sinuata* (Brassicaceae), *Food chem*. 121 (2010) 1020-1028.
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)	Science project No. 011-0982929-1329: "Essential oils and flavours- biological active compounds and their modifications", Ministry of Science, Education and Sports, Republic of Croatia, 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	
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	Assoc. Professor Ilza Salamunić, spec. Clinical Chemistry and Laboratory medicine
The course he/she teaches in the proposed study programme	Clinical laboratory diagnostics
GENERAL INFORMATION ON COURSE TEACHER	
Address	Jobova 3, 21000 Split
Telephone number	091 5230032
E-mail address	ilza.salamunic@gmail.com
Personal web page	///
Year of birth	1949.
Scientist ID	284860
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	Assoc. Professor, 12.07. 2010.
Area and field of election into research or art rank	Biomedicine & Heaith, Pharmacy, Medical biochemistry
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	retired
Date of employment	1975.
Name of position (professor, researcher, associate teacher, etc.)	Assoc. Professor
Field of research	Medical biochemistry and laboratory medicine
Function	lecturer
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Ph:D.
Institution	University of Zagreb, Faculty of Pharmacy and medical biochemistry
Place	Zagreb
Date	1975.
INFORMATION ON ADDITIONAL TRAINING	
Year	1993.
Place	Budapest, Hungary
Institution	WHO/EMRO
Field of training	Standardization and Qualitay assurance in clinical chemistry, haematology and immunology
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	Laboratory diagnosis, , Medical faculty, Split, Clinical biochemistry, Immunology and immunochemistry Imunologija, Basic Laboratory Tests, University Department of Health Studies, Split, integrated undergraduate and graduate study

study programme)	
Authorship of university/faculty textbooks in the field of the course	1. **Salamunić, Ilza**. Gastric, Pancreatic, and Intestinal diseases// Medicinskobiokemijska dijagnostika u kliničkoj praksi / Topić, Elizabeta ; Primorac, Dragan ; Janković, Stipan (ur). (ur.). Zagreb : Medicinska naklada, 2004. Str. 62-71. 2. **Salamunić, Ilza**. Non-disease factors may affect clinical laboratory tests values // Medicinskobiokemijska dijagnostika u kliničkoj praksi / Topić, Elizabeta ; Primorac, Dragan ; Janković, Stipan (ur.). Zagreb : Medicinska naklada, 2004. Str. 11-15. 3. **Salamunić, Ilza**; Nikolac, Nora. Reference Information for the Clinical Laboratory// Medicinskobiokemijska dijagnostika u kliničkoj praksi / Topić, Elizabeta ; Primorac, Dragan ; Janković, Stipan (ur.). Zagreb : Medicinska naklada, 2004. 4. Topić, Elizabeta; **Salamunić, Ilza**; Margetić, Sandra; Getaldić, Biserka; Čulić, Srđana; Dvornik, Štefica; Šimundić, Ana-Maria; Štefanović, Mario; Janković, Stipan; Staničić, Ante. Modern approach to medical diagnosis in primary medical care,Zagreb : Medicinska naklada, 2006.
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. Utrobičić I, Novak I, Marinović-Terzić I, Matić K, Lessel D, **Salamunić I,** Babić Saraga M, Kunac N, Mešin Koštić A, Kubisch C, Maček B, Terzić J. Carpal tunnel syndrome is associatedwith high fibrinogen and fibrinogen deposits. Neurosurgery. 75 (2014),3;276-285. (članak znanstveni CC) 2. Jurisić Z, Martinović-Kaliterna D, Marasović-Krstulović D, Perković D, Tandara L, **Salamunić I**, Carević V. Relationship between interleukin-6 and cardiac involvement in systemic sclerosis. Rheumatology. 2013;52;1298-1302. (članak, znanstveni, CC) 3. Režić-Mužinić N, Čikeš-Čulić V, Božić J, Tičinović-Kurir T, **Salamunić I**, Markotić A.Hypercalcemia includes a proinflammatory phenotype in rat leukocytes and endothelial cells. Journal of physiology and biochemistry. 69 (2013), 2; 199-205 (članak znanstveni, CC) 4. Bilić I, Petri N, Krstulja M, Vučković M, **Salamunić I,** Kraljević-Šiško K, Čapkun V, Lušić I. Hyperbaric oxygen is effective in early stage of healing of experimental brain abscess in rats. Neurological research. 34 (2012), 10; 931-936. (članak znanstveni, CC) 5. Krnić M, Modun D, Budimir D, Gunjača G, Jajić I, Vuković J, **Salamunić I,** Sutlović D, Kozina B, Boban M. Comparison of acute effects of red wine, beer and vodka against hyperoxia-induced oxidative stress and increase in arterial stiffness in healthy humans. Atherosclerosis (Amsterdam). 218 (2011), 2;

	530-535. (članak, 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)	9. Scientific project Cardiovascular effects of wine and its compounds, collaborator
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	**Ph.D. Vesna Sokol, assistant professor**
The course he/she teaches in the proposed study programme	Selected topics of pharmaceutics
GENERAL INFORMATION ON COURSE TEACHER	
Address	Teslina 10, 21 000 Split
Telephone number	021 – 329– 448
E-mail address	vsokol@ktf-split.hr
Personal web page	
Year of birth	1968.
Scientist ID	212806
Research or art rank, and date of last rank appointment	Senior Research Associate, 2014.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Assistant professor, 2008.
Area and field of election into research or art rank	Area of the natural sciences, field chemistry
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Chemical Technology, University of Split
Date of employment	1996.
Name of position (professor, researcher, associate teacher, etc.)	Assistant professor
Field of research	Physical chemistry
Function	Head of Department
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Ph.D.
Institution	Faculty of Chemical Technology, University of Split
Place	Split
Date	31. 10. 2006.

INFORMATION ON ADDITIONAL TRAINING	
Year	2007
Place	Rijeka, Croatia
Institution	University of Rijeka
Field of training	Chemistry
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)	
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)	Physical Chemistry, Undergraduated study of Chemistry and Chemical Technology
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. Jurić, A. Prkić, J. Giljanović, M. Brkljača, V. Sokol, P. Bošković, T. Vukušić, Determination of Total Fluoride Content in Teas by Using Fluoride Ion-Selective Electrode. *International Journal of Electrochemical Science* 9 (2014) 5409-5415. P. Bošković, V. Sokol, A. Prkić, J. Giljanović, Conductometric Study of Sodium Chloride in Aqueous 2-Methylpropan-2-ol of Mass Fraction 0.10, 0.30, 0.50, 0.70, 0.80 and 0.90. *International Journal of Electrochemical Science* **9** (2014) 3574-3587. P. Bošković, V. Sokol, R. Tomaš, A. Prkić, Conductometric Study of Potassium Chloride in Ethanol - Water Mixtures. *International Journal of Electrochemical Science* **8** (2013) 10961-10975.

	A. Prkić, V. Sokol, P. Bošković, Conductometric Study of Cesium Bromide in Aqueous Butan-2-ol of Lower Mass Fraction. *International Journal of Electrochemical Science* **8** (2013) 4886-4900. V. Sokol, R. Tomaš, P. Bošković, Ion-Association Reaction of Rb^+ and Br^- in 2- Methylpropan-2-ol + Water Mixtures, *Acta Chimica Slovenica* **59** (2012) 920-926.
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)	MSES scientific project 011-0000000-3220: "Electrolytes in mixed solvents", 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?	
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)	Positive student evaluation

First and last name and title of teacher	**PhD, Nataša Stipanelov Vrandečić, Associated Professor**
The course he/she teaches in the proposed study programme	Containers in Pharmacy
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 where it is/was offered, and level of study programme)	Packaging, Professional Study of Chemical Technology; Study Orientations: Food Technology Packaging, Academic Graduate Study of Chemical Technology, Study Orientations: Mediterranean Crops
Authorship of university/faculty textbooks in the field of the course	Packaging, handbook, Faculty of Chemistry and Technology, Split, 2010.
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	M. Jakić, **N. Stipanelov Vrandečić**, 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	**Davorka Sutlovic, Associate Professor**
The course he/she teaches in the proposed study programme	Pharmaceutical Toxicology Tribunal Pharmacy
GENERAL INFORMATION ON COURSE TEACHER	
Address	Kranjčevićeva 28
Telephone number	098/9534934/
E-mail address	dsutlov@kbsplit.hr
Personal web page	/
Year of birth	1961.
Scientist ID	256403
Research or art rank, and date of last rank appointment	Scientific Adviser; 2012.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Associate Professor; 2012.
Area and field of election into research or art rank	Biomedicine and health; Basic medical sciences
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Clinical Hospital Centre Split; Medical School Split
Date of employment	1996.
Name of position (professor, researcher, associate teacher, etc.)	Associate Professor
Field of research	forensic toxicology and DNA analysis
Function	Head of chemistry department I
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Ph.D.; M.Sc.; B.Sc.;
Institution	SPLIT MEDICAL SCHOOL; FACULTY OF SCIENCE; FACULTY OF CHEMISTRY AND TECHNOLOGY
Place	SPLIT; ZAGREB; SPLIT
Date	2005; 2003; 1987;
INFORMATION ON ADDITIONAL TRAINING	
Year	2011. 2007; 2005; 2005; 2005; 2004; 2004; 1998;
Place	*Italy, Pavia and Verona; Greek- Athens; ZAGREB; Germany – Duisburg; ZAGREB; Plitvice; Germany - Darmstadth; PULA ;*
Institution	Clinical Hospital; Medical School; Medical School- Department of forensic science and criminology; Shimadzu; Center for Criminalistic Investigation " Ivan Vučetić"; European Societies of Toxicology; Applied Biosystems; European Societies of Toxicology;
Field of training	Clinical toxicology; Forensic toxicology; Forensic toxicology; Toxicology; Forensic toxicology; Toxicology; Toxicology; Toxicology
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)	**1. UNDERGRADUATE AND GRADUATE**: ON MEDICINE STUDY from 2000. - Forensic science from 2007. - Small dose of toxicology from 2007. - Drugs Abuse in sport 2. **UNDERGRADUATE AND GRADUATE**: STUDY OF PHARMACY from 2011. - Forensic pharmacy from 2011. - Pharmaceutical toxicology 3. **UNDERGRADUATE AND GRADUATE**: STUDY OF MEDICAL LABORATORY DIAGNOSTICS from 2012. - INSTRUMENTAL TECHNIQUES IN MLD from 2012. - Food Toxicology 4. **GRADUATE**: STUDY FOR FORENSIC SCIENCES from 2010. - Forensic chemistry and toxicology I from 2010. - Forensic chemistry and toxicology II from 2010. - Applied forensic toxicology from 2010. - Food Toxicology 5. **POSTGRADUATE STUDY:** 5.1.ON MEDICAL SCHOOL SPLIT from 2007. - Biochemical mechanisms of toxicity 5.2.ON LAW SCHOOL SPLIT - STUDY OF MEDICAL LAW from 2007. - Forensic medicine from 2007. - CSI Split - Medical criminology 5.3. ON PHARMACEUTICAL AND BIOCHEMISTRY SCHOOL OF ZAGREB STUDY OF TOXICOLOGY from 2011. - Forensic toxicology in human medicine
Authorship of university/faculty textbooks in the field of the course	1. SutloviC Davorka, et al. Fundamentals of Forensic Toxicology. Split: Redak; 2011. 2. Sutlovic Davorka, et al. Food Toxicology. Split: Redak; 2011. 3. Sutlović Davorka. Basics of chemistry, forensics manual for students. Split: Redak; 2013.
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. Stipišić, Angela; Veršić-Bratinčević, Maja; Knezović, Zlatka, Sutlović, Davorka. **Metal content in medieval skeletal remains from Southern Croatia**. // *Journal of archaeological science*. **46** (2014) ; 393-400 (članak, znanstveni). 2. Sutlović, Davorka; Ščepanović, Antonija; Bošnjak, Marinko; Veršić-Bratinčević, Maja; Definis-Gojanović, Marija. **The role of alcohol in road traffic accidents with fatal**

	outcome : ten-year period in Croatia Split-Dalmatia County. // *Traffic injury prevention*. **15** (2014) , 3; 222-227 (članak, znanstveni). 3. Sutlović, Davorka; Veršić Bratinčević, Maja; Definis-Gojanović, Marija. **Blood alcohol stability in post mortem blood samples**. // *American journal of forensic medicine and pathology*. **35** (2014) , 1; 55-58 (članak, znanstveni). 4. Nestić, Marina; Babić, Sandra; Mutavdžić Pavlović, Dragana; Sutlović, Davorka. **Molecularly imprinted solid phase extraction for simultaneous determination of Δ9- tetrahydrocannabinol and its main metabolites by gas chromatography-mass spectrometry in urine samples**. // *Forensic science international*. **231** (2013) , 1/3; 317-324 (članak, znanstveni). 5. Borić, Igor; Ljubković, Jelena; Sutlović, Davorka. **Discovering the 60 years old secret: Identification of the World War II mass grave victims from the island of Daksa near Dubrovnik, Croatia**. // *Croatian medical journal*. **52** (2011) , 3; 327-335 (članak, znanstveni). Ostali radovi u CC časopisima 1. Sutlović, Davorka; Nestić, Marina; Kovačić, Zdravko; Gusić, Stjepan; Mlinarek, Tajana; Salamunić, Ilza; Sardelić, Sanda. **Microbial ethanol production in postmortem urine sample**. // *Medicine, science and the law*. **53** (2013) , 4; 240-243 (članak, stručni). 2. Definis-Gojanović, Marija; Gugić, Dijana; Sutlović, Davorka. **Suicide and Emo Youth Subculture – A Case Analysis**. // *Collegium antropologicum*. **33** (2009) , 2; 173-175 (prethodno priopćenje, stručni).
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. - Heavy metals in human remains from Klis and Bribir ancient county; LEADER; FUNDING SOURCE - MINISTRY OF

	SCIENCE, EDUCATION AND SPORTS 2007. - Cardiovascular effects of wine and its constituents; RESEARCHER -FUNDING SOURCE - MINISTRY OF SCIENCE, EDUCATION AND SPORTS
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?	Mandatory education at the Medical Faculty Split Tempus Project Training of Trainers in Vienna (2x), Pécs and Zagreb
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	**Dr sc.Miroslav Šober, full professor**
The course he/she teaches in the proposed study programme	Pharmaceutical Quality Control
GENERAL INFORMATION ON COURSE TEACHER	
Address	Antuna Branka Šimića 21, Sarajevo Bosnia and Herzegovina
Telephone number	++387-61-303-148
E-mail address	miro.sober@gmail.com
Personal web page	///
Year of birth	1958.
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	Quality Control of Drugs, full professor 2010. Toxicological Chemistry, full professor 2008.
Area and field of election into research or art rank	Biomedicine and Health/Pharmacy/Pharmaceutical analysis
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Pharmacy, University of Sarajevo
Date of employment	May,1985.
Name of position (professor, researcher, associate teacher, etc.)	Full professor
Field of research	Pharmacy/Pharmaceutical analysis/Analysis of medicinal products/Toxicological chemistry
Function	Vice dean; Head of the department; Director of doctoral studies
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty of Pharmacy, University of Sarajevo
Place	Sarajevo
Date	1996.
INFORMATION ON ADDITIONAL TRAINING	
Year	2007.
Place	Sarajevo
Institution	Bio-Base/TÜV Adria
Field of training	Implementation of HACCP system
Year	2005.
Place	Ljubljana, Slovenia
Institution	Agency for medicinal products and medical devices
Field of training	Marketing authorisation procedure for medicinal products in EU
Year	1997.
Place	Bratislava, Slovakia
Institution	UNDP
Field of training	Chemical risk assessment
Year	1996.
Place	Vienna, Austria
Institution	Institute for Analytical Chemistry, University of Vienna
Field of training	Chromatographic methods of chemical analysis
Year	1995. – 1998.
Place	Sarajevo B&H
Institution	Federal Ministry of Health
Field of training	Specialist degree in toxicological chemistry
Year	1986.
Place	Philadelphia, PA, USA

Institution	Weed Research Center
Field of training	Application of instrumental methods in the analysis of compounds with allelopathic activity
Year	1985.
Place	Sarajevo
Institution	Faculty of Philosophy, University of Sarajevo
Field of training	Pedagogy and didactics for university teaching
Year	1983.
Place	Manchester, UK
Institution	V.G. Analytical
Field of training	Mass specctrometry
Year	1982.
Place	Zagreb, Croatia
Institution	Faculty of Veterinary Medicine
Field of training	Analysis of organochlorine insecticides by gas chromatography
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)	///
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. Quality Control of Drugs, integrated undergraduate and graduate study of pharmacy, University of Sarajevo 2. Analytics o Drugs, integrated undergraduate and graduate study of pharmacy, University of Mostar 3. Toxicological Chemistry, integrated undergraduate and graduate study of pharmacy, University of Sarajevo 4. Toxicological Chemistry, integrated undergraduate study of laboratory medicine, Faculty oh Health Sciences, University of Sarajevo
Authorship of university/faculty textbooks in the field of the course	B. Nikolin, M. Šober: Analytic of Drugs, second revised edition, Sarajevo publishing 2002 (university textbook)
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. Imamović B, Trifunović S, Bečić E, Dedić M, Šober M. Study of Homosalate Stability in Chlorinated Water and Identification Chalogenated By-Products by Gas Chromatography-Mass Spectrometry. Research Journal of Pharmaceutical, Biological and Chemical Sciences 2015; 6 (1): 990-1000 2. Bečić E, Imamović B, Dedić M, Šober M. SPE extraction and TLC Identification of Tetracycline and Fluoroquinolone in Surface Water. Bulletin of the Chemists and Technologists of Bosnia and Herzegovina 2014; 43: 35-40 3. Djedjibegovic J., Marjanovic A., Šober M., Sinanovic K. Cadmium Exposure from Food-Important Factors in Risk Assessment. In: Hasanuzzaman M., Fujita M., editors. Cadmium: Characteristics, Sources of Exposure, Health and Environmental Effects. New

	York: Nova Publishers, 2013; p. 311-341. 4. C. Harman, M. Grung, J. Djedjibegovic, A. Marjanovic, M. Sober, K. Sinanovic, E. Fjeld, S. Rognerud, S. B. Ranneklev. Screening for Stockholm Convention persistent organic pollutants in the Bosna River (Bosnia and Herzegovina). Environmental Monitoring and Assesment, 2012; 185(2): 1671-83. 5. J. Djedjibegovic, T. Larssen, A. Skrbo, A. Marjanovic, M. Sober. Contents of cadmium, copper, mercury and lead in fish from the Neretva river (Bosnia and Herzegovina) determined by inductively coupled plasma mass spectrometry (ICP-MS). Food Chemistry, 2012; 131 (2): 469-476
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	1. Šober M, Đeđibegović J, Marjanović A. Perspectives and Challenges in Education Pharmacy Professionals. X Symposium of Pharmacists of Federation B&H 2013, Proceedings. 2. M. Šober, A. Marjanović, J. Đeđibegović. Education of pharmacists in Federation of Bosnia and Herzegovina and the role of professional organizations. Vox Pharmaciae, 2010; 1: 4-7.
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	1. Scientific project: Capacity building for local implementation of the Stockholm Convention in BiH (BiHNoPOP). Financed by Norwegian Ministry of Foreign Affairs (2009-2011)-BH team coordinator 2. Scientific project: Cooperation and capacity building on implementation of the Stockholm convention in BiH. Financed by Norwegian Ministry of Foreign Affairs (2012-2014)-BH team coordinator
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 course "Pedagogy and didactics for university teaching" for a period of four months at the Faculty of Philosophy, University of Sarajevo, intended for teachers of the University of Sarajevo, 1985.
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	**Professor Janoš Terzić, MD, PhD**
The course he/she teaches in the proposed study programme	Immunology and Vaccinations Molecular Biology and Genetics
GENERAL INFORMATION ON COURSE TEACHER	
Address	Šoltanska ulica 2, 21000 Split
Telephone number	021557944
E-mail address	janos.terzic@mefst.hr
Personal web page	-
Year of birth	1965.
Scientist ID	209906
Research or art rank, and date of last rank appointment	Scientific advisor, 23.05.2011.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Professor, May 2011.
Area and field of election into research or art rank	Area: Biomedicine and health Field: Basic medical sciences
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Medical Faculty University of Split
Date of employment	October 1993.
Name of position (professor, researcher, associate teacher, etc.)	Professor and researcher
Field of research	Cancer research
Function	Vice Dean for Science, Professor
INFORMATION ON EDUCATION – Highest degree earned	
Degree	MD
Institution	Medical Faculty University of Zagreb
Place	Split
Date	May1991.
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Medical Faculty University of Zagreb
Place	Zagreb
Date	December 1998.
INFORMATION ON ADDITIONAL TRAINING	
Field: **Biomedical researcs** Year, Place, Institution:	1991-1993 *Postdoctoral fellowship*, Health Center-University of Connecticut, USA 1994-1997 *Master of Science* – University of Zagreb, School of Natural Sciences 1995 – *Short term fellowship*, Max Planck Institute Göttingen, Germany 1997-1998 *Ph.. D*. – University of Zagreb, Medical School 1997 – *One month fellowship*, Imperial College of Science, Medicine and Technology, London, UK 1999 – *Six month fellowship*, Max Planck Institute Tübingen, Germany 2002 – *Two months fellowship*, Ludwig Institute, Uppsala, Sweden 2005/2006 – One year *Fullbright fellowship*, University of California San Diego, USA 2008 – *EMBO fellowship*, University of California San Diego, USA

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)	
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)	Physiology – University of Split School of Medicine. Molecular Biology – University of Split School of Medicine.
Authorship of university/faculty textbooks in the field of the course	Emeryjeve osnove medicinske genetike", Turnpenny i Ellard, 14. edition, Medicinska naklada Zagreb, 2011. (One of the translators of exam literature textbook for the course in Medical genetics)
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. Marinovic-Terzic I*, Lessel D*, Vaz B*, Halder S*, Lockhart PJ*, Lopez-Mosqueda J, (**J. Terzić**) et al. Mutations in SPRTN cause early-onset hepatocellular carcinoma, genomic instability and progeroid features. **Nature Genetics** 2014 Nov;46(11):1239-44. doi: 10.1038/ng.3103. IF (*impact factor*) = 29,6 *- equal contribution; **J. Terzić** - corresponding author. 2. Marinović-Terzić I*, Utrobičić I*, Novak I*, Matić K, Lessel D, Salamunić I, Babić MS, Kunac N, Mešin AK, Kubisch C, Maček B, **Terzić J**. Carpal tunnel syndrome is associated with high fibrinogen and fibrinogen deposits. **Neurosurgery**. 2014 Sep;75(3):276-85. IF=3.0 *- equal contribution. **J. Terzić** - corresponding author. 3. **Terzić J,** Grivennikov S, Karin E, Karin M. Inflammation and colon cancer. **Gastroenterology**. 2010 Jun;138(6):2101-2114.e5. doi: 10.1053/j. IF=13, ***over 300 citations***. 4. **Terzić J*,** Palada V*, Mazzulli J, Bwala G, Hagenah J, Peterlin B, Hung AY, Klein C, Krainc D. Histamine N-methyltransferase Thr105Ile polymorphism is associated with Parkinson's disease. **Neurobiology of Aging.** 2012 Apr;33(4):836.e1-3. doi: 10.1016/j. *- equal contribution. IF=6 5. **Terzic J*,** Grivennikov S*, Karin E*, Mucida D, Yu GY, Vallabhapurapu S, Scheller J, Rose-John S, Cheroutre H, Eckmann L, Karin M. IL-6 and Stat3 are required for survival of intestinal epithelial cells and development of colitis-associated cancer. **Cancer Cell**. 2009 Feb 3;15(2):103-13. doi: 10.1016/j.ccr. *- equal contribution. IF=24, ***over 600 citations***.
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)	- "Role of inflammation in cancer development": 2007-2014. Ministry of Science Education and Sport. The most productive national project according to Croatian

	Scientific Landscape - ”Cancer pathogenesis” Goethe University, Collaborative project with Ivan Dikic.
The name of the programme in which the teacher acquired the methodological-psychological-didactic-pedagogical group of competences	„Medical education competences“ course at Medical Faculty University of Split
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	2001 Annual award "Anton Šercer", Croatian medical academia 2000 Annual award, Almae Matris Alumni Croatice – UK 2012. Annual award for science Slobodna Dalmacija 2013. ”The best professor”, Medical students at the finishing year of their studies; generation 2012/2013. 2014. Annual award for science, Republic of Croatia 2014. Award ”Pride of Croatia”
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)	Very good to Excellent

First and last name and title of teacher	**Associate professor Tina Tičinović Kurir, MD, PhD**
The course he/she teaches in the proposed study programme	Pathophysiology
GENERAL INFORMATION ON COURSE TEACHER	
Address	Šoltanska 2
Telephone number	021/557-871
E-mail address	tticinov@mefst.hr
Personal web page	/
Year of birth	1972.
Scientist ID	282292
Research or art rank, and date of last rank appointment	Senior Research Associate, 2013.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Associate professor, 2014.
Area and field of election into research or art rank	Biomedicine and health; Clinical medical sciences
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	School of Medicine Split; University Hospital Split
Date of employment	2003.; 1999.
Name of position (professor, researcher, associate teacher, etc.)	Professor; subspecialist in endocrinology and diabetology
Field of research	Pathophysiology; Clinical endocrinology and diabetology
Function	Head of Department; Head of Department
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	School of Medicine
Place	Split
Date	2007.
INFORMATION ON ADDITIONAL TRAINING	
Year	2013.
Place	Manchester, United Kingdom
Institution	Christie Hospital
Field of training	Endocrinological oncology
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 where it is/was offered, and level of study programme)	Pathophysiology (medicine, dental medicine, medical studies in English, pharmacy, health studies). Pathophysiology of endocrinopathies (medicine, dental medicine).
Authorship of university/faculty textbooks in the field of the course	Tičinović Kurir T i sur. Patofiziologija endokrinopatija-odabrana poglavlja. Split, Naklada Redak, 2013. (university textbook)

Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1) Režić-Mužinić N, Cikeš-Čulić V, Božić J, Tičinović-Kurir T, Salamunić I, Markotić A. Hypercalcemia induces a proinflammatory phenotype in rat leukocytes and endothelial cells. J Physiol Biochem. 2012; 69: 199-205. 2) Ferhatovic L, Banozic A, Kostic S, Kurir TT, Novak A, Vrdoljak L, Heffer M, Sapunar D, Puljak L. Expression of Calcium/Calmodulin-Dependent Protein Kinase II and Pain-Related Behavior in Rat Models of Type 1 and Type 2 Diabetes. Anesth Analg 2013; 116(3): 712-21. 3) Novak A, Muzinic NR, Culic VC, Bozic J, Kurir TT, Ferhatovic L, Puljak L, Markotić A. Renal distribution of ganglioside GM3 in rat models of types 1 and 2 diabetes. J Physiol Biochem 2013; 69:727-35 4) Kurir TT, Bozic J, Markotic A, Novak A. New insights in steroid diabetes. Acta Med Croatica 2012; 66: 303-10. 5) Kurir TT, Bozić J, Dragicević D, Ljutić D. Successful treatment of renal artery embolism even forty-eight hours after event. Acta Clin Croat. 2014;53(2):233-6.
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	1) Valic M, Giaconi J, Bozic J, Breskovic T, Peros K, Ticinovic Kurir Tina, Valic Z. Teaching physiology: blood pressure and heart rate changes in simulated diving.Period biol. 2014;116: 185-190.
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	Pathobiochemistry of glycosphingolipid antigens
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?	Course: Medical Education Skills (University of Split School of Medicine)
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)	Student evaluation: average grade above 4.

First and last name and title of teacher	**PhD, Renato Tomaš, Associate professor**
The course he/she teaches in the proposed study programme	Physical chemistry
GENERAL INFORMATION ON COURSE TEACHER	
Address	Teslina 10/V, 21000 Split
Telephone number	++385 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	Associate professor, May 2014
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.)	Associate professor
Field of research	1. *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). 2. *Supramolecular chemistry:* thermodynamics of calixarene chemistry. 3. *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)	1. Lecturer in Selected Topics in Physical Chemistry of Environmental to Ph.D. students of chemistry. 2. Lecturer in Colloid and Surface Chemistry to Ph. D. students of chemistry and biology. 3. Lecturer in Physical Chemistry to undergraduate and graduate students of chemistry, chemical technology, pharmacy, and biology and chemistry. 4. Seminar teacher to undergraduate and graduate students taking courses in Physical Chemistry. 5. Laboratory teacher in Physical chemistry to undergraduate and graduate students taking courses in Physical Chemistry. 6. Lecturer and seminar in Elements of Physical Chemistry on the professional study of chemical technology. 7. 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. 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	**Associate professor Siniša Tomić, PhD**
The course he/she teaches in the proposed study programme	Pharmaceutical nomenclature Pharmacopoeia Pharmaceutical legislation Drug research & development
GENERAL INFORMATION ON COURSE TEACHER	
Address	Lastovska 4, 10000 Zagreb
Telephone number	098/186 9341
E-mail address	sinisa.tomic@halmed.hr
Personal web page	
Year of birth	1965
Scientist ID	
Research or art rank, and date of last rank appointment	Scientific advisor, 10.10.2012.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Associate Professor, 08.06.2011.
Area and field of election into research or art rank	Biomedicine & Health, Basic medical sciences
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Croatian Agency for Medicinal Products and Medical Devices (HALMED)
Date of employment	01.10.2003.
Name of position (professor, researcher, associate teacher, etc.)	EU Affairs Advisor
Field of research	Regulatory sciences
Function	
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Doctor rerum naturalium
Institution	Friedrich Schiller University
Place	Jena, Germany
Date	June, 2006
INFORMATION ON ADDITIONAL TRAINING	
Year	1996.-1997
Place	Montréal
Institution	Biotechnology Research Institute
Field of training	PTP1E interactions
Year	1997.-1999.
Place	Montréal
Institution	McGill University
Field of training	Prolactin receptor signaling
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)	French (5)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	German (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)	Slovenian (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)	Registration and vigilance of medicines and medical devices (PhD Programme „Biomedicine & Health“, J.J. Strossmayer University, Osijek) Pharmacognosy (Bachelor's Programme „Biotechnology & Drug Research“, Department of Biotechnology, University of Rijeka) Health Legislation (Integrated Bachelor's & Master's Programme „Medical Biochemistry“, Faculty of Pharmacy and Biochemistry, University of Zagreb)
Authorship of university/faculty textbooks in the field of the course	Co-author of two chapters in the book „Clinical Pharmacology, second, supplemented and modified edition“, I. Francetić and D. Vitezić, Medicinska naklada, Zagreb, 2014 Croatian Pharmacopoeia with commentaries 2007 (editor)
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	Zorić N, Horvat I, Kopjar N, Vučemilović A, Kremer D, **Tomić S**, Kosalec I. Hydroxytyrosol Expresses Antifungal Activity in Vitro. *Curr Drug Targets* 2013;14:992-8. Benković G, Sokolić M, Čudina B, Truban Žulj R, **Tomić S**. Analysis of Purity Profiles of Generic Lisinopril Tablets Marketed in Croatia. *Coll Antropol* 2013;2:601-6. Mirošević Skvrce N, Macolić Šarinić V, Mucalo I, Krnić D, Božina N, **Tomić S.** Adverse drug reactions caused by drug-drug interactions reported to Croatian Agency for Medicinal products and Medical devices: a retrospective

	observational study. *Croat Med J* 2011;52:604-14.
	Bojić M, Debeljak Ž, Tomičić M, Medić-Šarić M, **Tomić S.** Evaluation of antiaggregatory activity of flavonoid aglycone series. *Nutr J* 2011; 10:73
	Lovreček D, **Tomić S.** A century of antivenom. *Coll Antropol* 2011;35:249-58.
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)	„Biologic active compounds, metabolites and QSAR“, researcher (No.: 006-0061117-1237; leader: professor Marica Medić-Šarić, PhD) „Excytotoxicity and neuroprotection in epilepsy and brain ischemia“, researcher (No.: 0062049, leader: Professor Gordana Župan, MD, PhD, 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?	
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	Diploma of the Croatian Pharmaceutical Society for dedicated work in the Association, 2009
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	**Associate professor Marija Tonkić, MD PhD**
The course he/she teaches in the proposed study programme	Pharmaceutical Microbiology
GENERAL INFORMATION ON COURSE TEACHER	
Address	Spinčićeva 1, 21 000 Split
Telephone number	021 556 206
E-mail address	mtonkic@kbsplit.hr
Personal web page	-
Year of birth	1960.
Scientist ID	217650
Research or art rank, and date of last rank appointment	Senior research scientist, 10.12. 2014.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Associate professor, 3. 3. 2011.
Area and field of election into research or art rank	Biomedicine and Health, Clinical Medical Sciences
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	University of Split School of Medicine
Date of employment	2008.
Name of position (professor, researcher, associate teacher, etc.)	Associate Professor
Field of research	Medical microbiology and parasitology
Function	Head o the Department
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	University of Split School of Medicine
Place	Split
Date	2006.
INFORMATION ON ADDITIONAL TRAINING	
Year	1989.-1994.; 1996.
Place	Zagreb
Institution	University ***Hospital*** for Infectious Diseases „ Dr. Fran Mihaljević“, Croatian Institute for Public Health, University of Zagreb School of Medicine Numerous workshops and seminars (at home and abroad).
Field of training	Clinical microbiology and parasitology
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)	
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	Course: Medical microbiology and parasitology Study programms: Medical Studies in English Dental Medicine

where it is/was offered, and level of study programme)	Farmacy
Authorship of university/faculty textbooks in the field of the course	1. **Tonkić M.** *Helicobacter.* U: Uzunović-Kamberović S, ur. Medicinska mikrobiologija. Zenica: Štamparija Fojnica; 2009, str. 483-487. 2. **Tonkić M.** Mikrobiološka dijagnostika infekcija u ginekologiji i perinatologiji. U: Karelović D, ur. Infekcije u ginekologiji i perinatologiji. Zagreb: Medicinska naklada: 2012. Str. 118-133. 3. **Tonkić M** i sur. Medicinska mikrobiologija. Praktikum za vježbe za studente Dentalne medicine. Split: Redak:2014.
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. **Tonkic M**, Mohar B, Sisko-Kraljevic K, Mesko-Meglic K, Goic-Barisic I, Novak A, Kovacic A, Punda V. High prevalence and molecular characterization of extended-spectrum beta-lactamase-producing *Proteus mirabilis* strains in southern Croatia. J Med Microbiol 2010;59:1185 – 90. 2. Goić-Barišić I, Bedenić B, **Tonkić M**, Novak A, Katić S, Kalenić S, Punda-Polić V, Towner KJ. Occurrence of OXA-107 and IS*Aba*1 in carbapenem-resistant isolates of *Acinetobacter baumannii* from Croatia. J Clin Microbiol 2009; 47: 3348-3349. 3. Goic-Barisic I, Towner KJ, Kovacic A, Sisko-Kraljevic K, **Tonkic M**, Novak A, Punda-Polic V. Outbreak in Croatia caused by a new carbapenem-resistant clone of *Acinetobacter baumannii* producing OXA-72 carbapenemase. J Hosp Infect 2011; 77: 368-370. 4. Megraud F, Coenen S, Versporten A, Kist M, Lopez-Brea M, Hirschl AM, Andersen LP, Goossens H, Glupczynski Y; Study Group participants. *Helicobacter pylori* resistance to antibiotics in Europe and its relationship to antibiotic consumption. Gut 2013;62:34-42. 5. Tonkic A, **Tonkic M**, Lehours P, Mégraud F. Epidemiology and diagnosis of *Helicobacter pylori* infection. Helicobacter. 2012;17 Suppl 1:1-8.
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)	"Mehanizmi rezistencije na antibiotike u gram-negativnih bakterija" (project number :108-1080114-0015).
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	**Zoran Valić, professor of physiology**
The course he/she teaches in the proposed study programme	Physiology
GENERAL INFORMATION ON COURSE TEACHER	
Address	Šoltanska 2; 21000 Split
Telephone number	021 557-945
E-mail address	zoran.valic@mefst.hr
Personal web page	http://genom.mefst.hr/physiology/cv/zvalic.html
Year of birth	1972
Scientist ID	253185
Research or art rank, and date of last rank appointment	research advisor, 30. 10. 2006.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	full professor – first election, 25. 07.2011.
Area and field of election into research or art rank	biomedicine and health, basic medical sciences
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	University of Split School of Medicine
Date of employment	02.05.2001.
Name of position (professor, researcher, associate teacher, etc.)	professor
Field of research	physiology
Function	vice dean for Medical studies in English program, head of Educational department of physiology
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	University of Split School of Medicine
Place	Split
Date	13. 12. 2002.
INFORMATION ON ADDITIONAL TRAINING	
Year	1998-2001, 2005
Place	Milwaukee, WI, USA
Institution	Medical College of Wisconsin
Field of training	physiology, blood flow regulation
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)	
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)	
Authorship of university/faculty	1. Berović, Nina; Božić, Joško; Bratanić, Andre; Dogas, Zoran;

textbooks in the field of the course	Kokić, Slaven; Korljan Jelaska, Betty; Krnić, Mladen; Kovačić, Vedran; Ljutić, Dragan; Markotić, Antita; Novak, Anela; Pecotic, Renata; Radić, Josipa; Radić, Mislav; Radman, Maja; Škrabić, Veselin; Tičinović Kurir, Tina; Valic, Zoran; Živković, Piero Marin. **Patofiziologija endokrinopatija : odabrana poglavlja** / Tičinović Kurir, Tina (ur.). Split : Redak, 2013. 2. Soldo, Alen; Valic, Zoran; Glavičić, Igor; Jurman, Bojan; Drviš, Ivan. **Ronjenje** / Soldo, Alen ; Glavičić, Igor ; Kolman, Milan (ur.). Samobor : Sveučilšte u Splitu ; Hrvatska olimpijska akademija, 2013.
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1) Clifford, P. S., J. A. Madden, J. J. Hamann, J. B. Buckwalter, and Z. Valic. Absence of flow-mediated vasodilation in the rabbit femoral artery. Physiol. Res. 59: 331-338, 2010. 2) Breskovic, T., Z. Valic, A. Lipp, K. Heusser, V. Ivancev, J. Tank, G. Dzamonja, J. Jordan, J. K. Shoemaker, D. Eterovic, and Z. Dujic. Peripheral chemoreflex regulation of sympathetic vasomotor tone in apnea divers. Clin. Auton. Res. 20: 57-63, 2010. 3) Gordan, Dz., J. Tank, K. Heusser, I. Palada, Z. Valic, D. Bakovic, A. Obad, V. Ivancev, T. Breskovic, A. Diedrich, F. C. Luft, Z. Dujic and J. Jordan. Glossopharyngeal insufflation induces cardioinhibitory syncope in apnea divers. Clin. Auton. Res. 20: 381-384, 2010. 4) Mollerlokken, A., T. Breskovic, I. Palada, Z. Valic, Z. Dujic, A. O. Brubakk. Observation of increased venous gas emboli after wet dives compared to dry dives. Diving Hyperb. Med. 41: 124-128, 2011. 5) Marinov, V., M. Valic, R. Pecotic, N. Karanović, I. Pavlinac Dodig, M. Carev, Z. Valic, and Z. Dogas. Sevoflurane and isoflurane monoanesthesia abolished the phrenic long-term facilitation in rats. Respir. Physiol. Neurobiol. 189: 607-613, 2013.
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	1. Valic, M., J. A. Giaconi, J. Bozic, T. Breskovic, K. Peros, T. Ticinovic Kurir, and Z. Valic. Teaching physiology: blood pressure and heart rate changes in simulated diving. Periodicum Biologorum. 116: 185-190, 2014.
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	1. Apnea diving and cardiovascular system, scientific project (216-2160133-0330)
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	2003. Award from The Academy of Medical Sciences of Croatia «Borislav Nakić» for the most valuable medical publication from the author under 35 years of age 2004. National Science Award – Annual Award for Junior Researchers 2006. Award from The Academy of Medical Sciences of Croatia «Ante Šercer» for the most valuable medical publication
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	**Prof. dr. sc. Eduard Vrdoljak**
The course he/she teaches in the proposed study programme	Oncological Pharmacy
GENERAL INFORMATION ON COURSE TEACHER	
Address	Pazdigradska 46, Split
Telephone number	021 556 129
E-mail address	edo.vrdoljak@gmail.com
Personal web page	-
Year of birth	1964.
Scientist ID	205415
Research or art rank, and date of last rank appointment	2012 Full Professor with Tenure position
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	-
Area and field of election into research or art rank	Clinical oncology
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Clinical Hospital split
Date of employment	1992.
Name of position (professor, researcher, associate teacher, etc.)	Head of the Clinic of oncology and radiotherapy
Field of research	oncology
Function	Head of oncology
INFORMATION ON EDUCATION – Highest degree earned	
Degree	doctor of medicine
Institution	Medical School in Zagreb
Place	Zagreb
Date	1989.
INFORMATION ON ADDITIONAL TRAINING	
Year	1992. – 1995.
Place	Split
Institution	Clinical Hospital Split, Center of oncology and radiotherapy
Field of training	oncology
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)	-
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)	Participation in teaching of Clinical Oncology since 1994. until today
Authorship of university/faculty textbooks in the field of the course	**KLINIČKA ONKOLOGIJA,** Medicinska naklada, Zagreb 2013

Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. L. T. Vahdat, **E Vrdoljak**, H Gómez, R K Li, L Bosserman, J A. Sparano, J Baselga, P Mukhopadhyay, V Valeroi. Efficacy and safety of ixabepilone plus capecitabine in elderly patients with anthracycline- and taxane-pretreated metastatic breast cancer. J Geriatr Oncol. 2013 Oct; 4 (4):346-52. doi: 10.1016/j.jgo.2013.07.006. 2. Miše BP, Telesmanić VD, Tomić S, Sundov D, Capkun V, **Vrdoljak E**. Correlation between E-cadherin Immunoexpression and Efficacy of First Line Platinum-Based Chemotherapy in Advanced High Grade Serous Ovarian Cancer. Pathol Oncol Res. 2014 Aug 11 PMID:25108408 3. von Minckwitz G, Puglisi F, Cortes J, **Vrdoljak** E, Marschner N, Zielinski C, Villanueva C, Romieu G, Lang I, Ciruelos E, De Laurentiis M, Veyret C, de Ducla S, Freudensprung U, Srock S, Gligorov J. Bevacizumab plus chemotherapy versus chemotherapy alone as second-line treatment for patients with HER2-negative locally recurrent or metastatic breast cancer after first-line treatment with bevacizumab plus chemotherapy (TANIA): an open-label, randomised phase 3 trial. Lancet Oncol. 2014 Oct;15(11):1269-78. doi: 10.1016/S1470-2045(14)70439-5. Epub 2014 Sep 28. PMID:25273342 4. Petrić Miše B**,** Boraska Jelavić T, Strikic A, Hrepić D**,** Tomić K, Hamm W, Tomić S, Prskalo T**, Vrdoljak E**. Long follow-up of patients with locally advanced cervical cancer treated with concomitant chemobrachyradiotherapy with cisplatin and ifosfamide followed by consolidation chemotherapy. International Journal of Gynecologycal Cancer, Oct 28, 2014. ISSN: 1048-891X, DOI:10.1097/IGC.0000000000000336 5. Vrdoljak E, Géczi L, Mardiak J, Ciuleanu T, Leyman S, Zhang K, Sajben P, Torday L. Central and Eastern European experience with sunitinib in metastatic renal cell carcinoma: a sub-analysis of the Global Expanded-Access Trial; Pathology & Oncology Research; PORE-D-14-00213R1, in press
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	1. **Vrdoljak** E. Cancer in Croatia; where do we stand and how to move forward? Croat Med J. 2012

at most)	Apr;53(2):91-2. 2. Lindemann K, Christensen RD, Vergote I, Stuart G, Izquierdo MA, Kærn J, Havsteen H, Eisenhauer E, Ridderheim M, Lopez AB, Hirte H, Aavall-Lundquvist E, **Vrdoljak E**, Green J, Kristensen GB. First-line treatment of advanced ovarian cancer with paclitaxel/carboplatin with or without epirubicin (TEC versus TC)--a gynecologic cancer intergroup study of the NSGO, EORTC GCG and NCIC CTG. 2012 Oct;23(10):2613-9. Epub 2012 Apr 26. 3. Valero V, **Vrdoljak E**, Xu B, Thomas E, Gómez H, Manikhas A, Medina C, Li RK, Ro J, Bosserman L, Vahdat L, Mukhopadhyay P, Opatt D, Sparano JA. Maintenance of Clinical Efficacy After Dose Reduction of Ixabepilone Plus Capecitabine in Patients With Anthracycline- and Taxane-Resistant Metastatic Breast Cancer: A Retrospective Analysis of Pooled Data from 2 Phase III Randomized Clinical Trials. 2012 Aug;12(4):240-6. Epub 2012 Jun 2. 4. **Vrdoljak E,** Rini B, Schmidinger M, Omrčen T, Torday L, Szczylik C, Sella A. Bisphosphonates and VEGF-targeted drugs in treatment of patients with renal cell carcinoma metastatic to bone, Anticancer Drugs 2013 Jun;24(5):431-440. 5. **Vrdoljak E**, Torday L, Sella A, Leyman S, Bavbek S, Kharkevich G, Mardiak J, Szczylik C, Znaor A, Wilking N. Insights into cancer surveillance in Central and Eastern Europe, Israel and Turkey. Eur J Cancer Care (Engl). 2013 Nov 8. doi: 10.1111/ecc.12149
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?	Clinical oncology
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	• The best paper acknowledgement, First Croatian Oncology Congress, Plitvice, 2001. • Croatian science and art academy award; Republic of Croatia's greatest scientific accomplishments in the field of medical science – 2008
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	Assoc. Prof. Katarina Vukojevic MD, PH.D.
The course he/she teaches in the proposed study programme	Human Anatomy and Histology
GENERAL INFORMATION ON COURSE TEACHER	
Address	Šoltanska 2, 21000 Split
Telephone number	+385 21 557 810
E-mail address	katarina.vukojevic@mefst.hr
Personal web page	http://www.mefst.unist.hr/default.aspx?id=616
Year of birth	1979
Scientist ID	**287964**
Research or art rank, and date of last rank appointment	Senior research assistant, 2013
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Associate professor, 2014
Area and field of election into research or art rank	Basic medical sciences
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	University of Split
Date of employment	May 1, 2006
Name of position (professor, researcher, associate teacher, etc.)	professor
Field of research	Human development
Function	Head of Laboratory for Early Human Development
INFORMATION ON EDUCATION – Highest degree earned	
Degree	MD. PhD
Institution	University of Split, School of Medicine
Place	Split
Date	February 16, 2009
INFORMATION ON ADDITIONAL TRAINING	
Year	1. 2013-2014; 2. 2009-2010
Place	1. New York 2. Toronto
Institution	1. Columbia University, College of Physicians and Surgeons, Division of Nephrology, New York, NY, USA 2. Dept of Biochemistry, Medical Genetics and Microbiology Terrence Donnelly Centre for Cellular and Biomolecular Research, University of Toronto, Toronto, Canada
Field of training	1. Human genetics 2. Molecular biology
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)
Foreign language and command of	French (excellent)

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)	*Graduate teaching at the University of Split School of Medicine and University of Mostar School of Medicine:* Core curriculum: Anatomy, Histology and Embryology Elective courses: "Development and congenital kidney diseases", "Diseases and Anomaly of head and neck". *Postgraduate teaching: Postgraduate school of the University of Mostar, School of Medicine:* Elective course: "Factors that influence early human development" *Postgraduate teaching: Postgraduate school of the University of Split, School of Medicine:* Elective course: "Human spinal ganglia development"
Authorship of university/faculty textbooks in the field of the course	Saraga-Babić M, Sapunar D, Puljak L, **Vukojević K**, Lovrić Kojundžić S, Carev D. Histology Atlas. Virtual Medical School, 2007. http://www.vms.hr/HistologyAtlas/index.htm Anatomy atlas: Sobotta - Atlas anatomije čovjeka I. + II. + III. hrv. izdanje: Ana Marušić, Dragica Bobinac, Vedran Katavić.
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. Sanna-Cherchi S, Sampogna RV, Papeta N, Burgess KE, Nees SN, Perry BJ, Choi M, Bodria M, Liu Y, Weng PL, Lozanovski VJ, Verbitsky M, Lugani F, Sterken R, Paragas N, Caridi G, Carrea A, Dagnino M, Materna-Kiryluk A, Santamaria G, Murtas C, Ristoska-Bojkovska N, Izzi C, Kacak N, Bianco B, Giberti S, Gigante M, Piaggio G, Gesualdo L, Kosuljandic Vukic D, **Vukojevic K**, Saraga-Babic M, Saraga M, Gucev Z, Allegri L, Latos-Bielenska A, Casu D, State M, Scolari F, Ravazzolo R, Kiryluk K, Al-Awqati Q, D'Agati VD, Drummond IA, Tasic V, Lifton RP, Ghiggeri GM, Gharavi AG. Mutations in DSTYK and dominant urinary tract malformations. **N Engl J Med.** 2013;**369**(7):621-9. doi: 10.1056/NEJMoa1214479. Epub 2013 Jul 17. 2. Kero D, Novakovic J, **Vukojevic K**, Petricevic J, Kalibovic Govorko D, Biocina-Lukenda D, Saraga-Babic M. Expression of Ki-67, Oct-4, γ-tubulin and α-tubulin in human tooth development. **Arch Oral Biol**. 2014 Jul 14;**59**(11):1119-1129. doi: 10.1016/j.archoralbio.2014.05.025. [Epub ahead of print] 3. Caric A, Poljicanin A, Tomic S, Vilovic K, Saraga-Babic M, **Vukojevic K**. Apoptotic pathways in ovarian surface epithelium of human embryos during embryogenesis and carcinogenesis: Close relationship of developmental plasticity and neoplasm. **Acta Histochem.** 2013 Sep 19. doi:pii: S0065-1281(13)00156-6. 10.1016/j.acthis.2013.08.005. [Epub ahead of print]

	4. Agnić I, **Vukojević K**, Saraga-Babić M, Filipović N, Grković I. Isoflurane post-conditioning stimulates the proliferative phase of myocardial recovery in an ischemia-reperfusion model of heart injury in rats. **Histol Histopathol**. 2013 Jul 12. [Epub ahead of print] 5. Bakovic M, Juric Paic M, Zdrilic E, **Vukojevic K**, Ferhatovic L, Marin A, Filipovic N, Grkovic I, Puljak L. Changes in cardiac innervation during maturation in long-term diabetes. **Exp Gerontol.** 2013;**48**(12):1473-1478. doi: 10.1016/j.exger.2013.10.004. [Epub ahead of print]
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	1. Koceic A, Mestrovic A, Vrdoljak L, **Vukojevic K**, Barac-Latas V, Drenjancevic-Peric I, et al. Analysis of the elective curriculum in undergraduate medical education in Croatia. **Medical education**. 2010;**44**(4):387-395. 2. Novak K, Miric D, Jurin A, **Vukojevic K**, Aljinovic J, Caric A, et al. Awareness and use of evidence-based medicine databases and Cochrane Library among physicians in Croatia. **Croatian medical journal**. 2010;**51**(2):157-164. 3. Puljak L, **Vukojevic K**, Lovric Kojundzic S, Sapunar D. Assessing clinical and life sciences performance of research institutions in Split, Croatia, 2000-2006. **Croatian medical journal**. 2008;**49**(2):164-174. 4. Bošnjak I, Puljak L, **Vukojević K**, Marušić A. Analysis of a number and type of publications that editors publish in their own journals: case study of scholarly journals in Croatia. **Scientometrics**. 2011;**86**:227-233.
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	Principal investigator in the project:" Expression of ZAP-70 and proliferative activity of leukemia cells in B-chronic lympfocytic leukemia" (2010-2011) Participation in the project: "Razvoj i bolesti aksijalnih struktura u čovjeka" (MZOŠ No. 0216002. (2006-2007) principal investigator: prof dr. Mirna Saraga-Babić. Participation in the project"Genska ekspresija u ranom razvoju čovjeka" (MZOŠ No. 021-2160528-0507. 2007-2014) principal investigator: prof. dr. Mirna Saraga-Babić. Participation in the project: "Razvoj perifernog živčanog sustava u čovjeka (Ministarstvo nauke i obrazovanja Federacije Bosne i Hercegovine principal investigator: dr. sc. Helena Škobić. (2010) Participation in the project: "Biomarkeri normalnog i abnormalnog razvoja i pridruženi multifaktorijalni poremećaji" (MZOŠ, hrvatsko-slovenski projekt, 2008- 2012) principal investigator: prof. dr. Mirna Saraga-Babić. Principal investigator in FMON project:"The role of Ki-67, a-tubulina and Oct-4 in human spinal cord development" 2012-2013. Participation in the project NZZ-a: "MEMODIN", principal

	investigator prof. dr. sc. Livia Puljak (2011-2013) Participation in the project R01 DK103184-01National Institute of Health, USA "Genetics of Congenital Obstructive Uropathy", principal investigator Dr. Simone Sanna-Cherchi', 2014-
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoške kompetencije?	Anatomy, Histology and Embryology
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	2013 – 2014 The American Association of University Women (AAUW) – International Fellowship winner
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)	4.8

First and last name and title of teacher	**Professor Davorka Završnik**
The course he/she teaches in the proposed study programme	Pharmaceutical Chemistry II
GENERAL INFORMATION ON COURSE TEACHER	
Address	Tuzlanska VI-A; Sarajevo, Bosnia andi Herzegovina
Telephone number	+387 61 241 978
E-mail address	dzavrsnik@yahoo.com
Personal web page	#
Year of birth	1957
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	Professor , 30.3.2011.
Area and field of election into research or art rank	Biomedicine & Health, Pharmacy
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	University of Sarajevo, Faculty of Pharmacy Sarajevo
Date of employment	1.10.1997.
Name of position (professor, researcher, associate teacher, etc.)	Professor
Field of research	Pharmaceutical Chemistry, Drug Design
Function	Dean of Faculty of Pharmacy Sarajevo, Head of Department
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Ph.D
Institution	University of Sarajevo, Faculty of Pharmacy Sarajevo
Place	Sarajevo
Date	28.6.2000.
INFORMATION ON ADDITIONAL TRAINING	
Year	1990.
Place	Clinical Centre Ljubljana
Institution	Pharmacy
Field of training	Preparation of mixtures for total parenteral application
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)	German, 4
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	Russian, 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)	1. Pharmaceutical Chemistry 1, Pharmaceutical Chemistry 2, Drug Design, Faculty of Pharmacy, University of Sarajevo, the integrated first and second cycle studies 2. Selected Topics in Pharmaceutical Chemistry, Faculty of

	Pharmacy, University of Sarajevo, postgraduate studies 3. Molecular basis of pharmaceutical chemistry, QSAR and QSPR application in drug design and The role of bioinformatics in drug design, Faculty of Pharmacy , University of Sarajevo, doctoral study 4. Pharmaceutical Chemistry, Faculty of Pharmacy Tuzla, University of Tuzla, undergraduate and postgraduate studies 5. Pharmaceutical Chemistry 2, Mostar Faculty of Pharmacy, University of Mostar, integrated first and second cycle studies
Authorship of university/faculty textbooks in the field of the course	1. Završnik D, Mehmedagić A, Špirtović S. Antibiotics, Faculty of Pharmacy Sarajevo, 978-9958-870-00-2, 2009.
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. Meščić A, Glavač D, Osmanović A, Završnik D, Cetina M, Makuc D, Plavec J, Ametamey S.M., Raić-Malić S. *N*-alkylated and *O*-alkylated regioisomers of 5-(hydroxyalkyl)pyrimidines: Synthesis and structural study. Journal of Molecular Structure, Volume 1039, 8 May 2013, Pages 160-166 2. Završnik D, Muratović S, Makuc D, Plavce J, Cetina M, Nagl A, De Clercq E, Balzarini J and Mintas M. Benzylidene-bis-(4-Hydroxycoumarin) and Benzopyrano-Coumarin Derivatives: Synthesis, $^{1}H/^{13}C$-NMR Conformational and X-ray Crystal Structure Studies and *In Vitro* Antiviral Activity Evaluations. *Molecules* 2011, *16*(7), 6023-6040. 3. Meščić A, Krištafor, Novaković I, Osmanović A, Müller U, Završnik D, Ametamey S M, Scapozza L, Raić-Malić S. C-5 Hydroxyethyl and Hydroxypropyl Acyclonucleosides as Substrates for Thymidine Kinase of Herpes Simplex Virus Type 1 (HSV-1 TK): Syntheses and Biological Evaluation. *Molecules* 2013, *18*, 5104-5124. 4. *Muratović S, Durić K, Veljović E, Osmanović A, Softić Dž, Završnik D. Synthesis of biscoumarin derivatives as antimicrobial agents. Asian Journal of Pharmaceutical and Clinical Research. 2013, 6; 131-134.* 5. Špirtović-Halilović S, Salihović M, Trifunović S, Roca S, Veljović E, Osmanović A, Vinković M, Završnik D. Density functional theory: ^{1}H- and ^{13}C-NMR spectra of some coumarin Journal of the Serbian Chemical Society, 2014 79(11):1405-1411.
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	1. »Development of novel C-5 fluoroalyl N-acyclic pyrimidine nucleoside analogs as PET tracers for in situ monitoring of

carried out in the last five years (5 at most)	gene and cell-based therapies using HSV1-TK as a reporter gene« SCOPES, Schweizischer Nacionalfonds zur Förderung der wissenschaftlichen Forschung 2009-2012. 2. Testing of bioactive newly synthesized derivatives of 3-substituted-4-hydroxycoumarin " Federal Ministry of Education and Science BiH, (2011), 3. New analogs of acyclic nucleoside - Synthesis, Structure and Biological Activity ", Federal Ministry of Education and Science BiH (2013) 4. Application of Green Chemistry in the development and synthesis of biologically active xanthines and biscoumarins " Federal Ministry of Education and Science BiH (2013), 5. Modeling and docking studies of new potent azomethine derivativesof thymoquinone and their organometallic complexes " Federal Ministry of Education and Science BiH (2014).
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoške kompetencije?	#
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	The most successful teacher of the Faculty of Pharmacy, University of Sarajevo, 2008.
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)	

3.3. Optimal number of students

Optimal number of students per year is 30.

3.4. Estimate costs per student

Annual study costs are around 40000 Kn per student.

3.5. Plan of procedures of study programme quality assurance

In keeping with the European standards and guidelines for internal quality assurance in higher education institutions (according to "Standards and Guidelines of Quality Assurance in the European Higher Education Area") on the basis of which the University of Zagreb defines procedures for quality assurance, the proposer of the study programme is obliged to draw up a plan of procedures of study programme quality assurance.	
Documentation on which the quality assurance system of the constituent part of the University is based:	
• Regulations on the quality assurance system of the constituent part (enclose if existing)	
• Handbook on the quality assurance system of the constituent part (enclose if it exists)	
Description of procedures for evaluation of the quality of study programme implementation: • 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	The process of student evaluation of teaching is conducted by the Centre / Department for quality in cooperation with the Committee for quality improvement of the departments. The procedure consists of: informing students and teachers, student questionnaire surveys, questionnaire analysis and presentation of results and measures for improving quality. The procedure is described in detail in the Guidelines for conducting student evaluation of teaching, University of Split. Survey is conducted on the last day of each teaching cycle. Analysis and delivery of survey results is the responsibility of the Centre / Department for the quality. Summary of the results for each department are presented to the Dean and to the President of the Committee for Quality Improvement. After analyzing the results of student surveys, dean holds informative meetings with the 10% of the worst-rated teachers and informs the Rector. Also, departments that have received lower ratings hold meetings on improving the quality of teaching. Our School, in accordance with the Regulations on rewards and recognition, rewards each year best teachers, associates

	and departments according to the results of student surveys.
Monitoring of grading and harmonization of grading with anticipated learning outcomes	The assessment of students at our School is carried out during classes (continuous evaluation) and during the exams. In student assessment the compliance of literature and teaching, as well as literature and the contents of the exam is particularly important. On the School website, under "Department" the curriculum of each department is specified. All teachers are listed in tables along with teaching schedules and units accompanied by chapters from books that are required reading. For written exams, scoring systems are explained in detail. Everything listed above contributes to the organization and execution of teaching, and to better communication with students. The assessment of the acquired knowledge through written exams has become the standard that is applied to all School programs. Committee for teaching, Committee for supervision of the teaching and Committee for Quality Improvement are all involved in the monitoring of the implementation of these procedures.
Evaluation of availability of resources (spatial, human, IT) in the process of learning and instruction	Evaluation of the availability of resources is partly carried out through a questionnaire for student evaluation of expert and administrative services and partly through the evaluation of the overall study program. Evaluation is conducted by the Department / Centre for Quality in cooperation with the Committee for Quality Improvement. The survey is conducted at the end of each academic year. The data is processed and the results are submitted to the Department for quality.
Availability and evaluation of student support (mentorship, tutorship, advising)	After enrolling in the first year, each student is assigned an advisor. The goal of this feature is providing assistance and guidance to students in order to master curriculum as easy as possible. As instructed by the dean and the vice dean for education, student representatives , analyze and timely inform the Dean's Office and the department if one of the students has encountered the problem with the successful completion of each examination in order to ensure timely response. We do not have formal way to evaluate support to students.
Monitoring of student pass/fail rate by course and study programme as a whole	The process of monitoring student rate of transition is conducted by the Centre / Department for quality using a questionnaire filled out by the School. This activity is carried out once a year at the beginning of the academic year for the previous academic year. Also, our School carries out internal analysis of students for each subject, exam and program after the first exam period, and before the autumn exam period, and the end of the academic year. The procedure is implemented by Student administration, Office for teaching and the departments. The results of rate of

	transition are discussed in the meetings of the Committee for teaching.
Student satisfaction with the programme as a whole	The process of student evaluation of the entire study program is conducted by the Department for quality in cooperation with the Committee for Quality Improvement and Student administration. This procedure is carried out electronically using EVASYS platform after the defense of the final thesis, and the data processing is conducted by the Department for quality. The results are submitted to the Dean and to the President of the Committee for Quality Improvement. The results of the survey are discussed among dean and vice deans, the Committee for teaching and the Committee for Quality Improvement.
Procedures for obtaining feedback from external parties (alums, employers, labour market and other relevant organizations)	Establishment of the alumni association is in progress. The School is in contact with the Croatian Medical Chamber, the Croatian Employment Service (regional office Split) and other stakeholders, and follows the trends and rates of employment of the staff we train.
Evaluation of student practical education (where this applies)	not applicable
Other evaluation procedures carried out by the proposer	/
Description of procedures for informing external parties on the study programme (students, employers, alums)	On the Faculty of Medicine, University of Split website (www.mefst.hr) and Faculty of Chemistry and Technology website (www.ktf.unist.hr) all necessary information on study programs, admission requirements and enrollment quotas are provided. Our opinion is that personal contact with potential students is very important and we attend the "The University Fair" each year. We are broadening the presentation of our School by participating in numerous festivals such as "Summer Science Factory", "Festival of Science", "Brain awareness weak" since such events are often attended by prospective students. A significant contribution to presentation of our School is brought by the Herald published by the staff and the students of the School biannually since 2007. We also published the "First student guide for freshmen." These publications, although intended for students already enrolled, can serve as an excellent source of information for all concerned.