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Faculty: Faculty of Science

Course ID: ÚCHV/	<b>Course name:</b> 1D & 2D NMR Spectroscopy
NMR1/00	

### Course type, scope and the method: Course type: Lecture / Practice

**Recommended course-load (hours): Per week:** 2 / 3 **Per study period:** 28 / 42

Course method: present

#### **Number of ECTS credits:** 6

#### **Recommended semester/trimester of the course:**

Course level: II.

Prerequisities:

#### **Conditions for course completion:**

Active student's work at seminars and individual homework, written examinations in 7th and 14th semestral week.

Terminal examination in written form (4 exercises from combined applications of 1D a 2D NMR and other spectral methods) and oral form (3 themes) joining theoretical knowledge with a practical solution of selected NMR problems and exercises.

#### Learning outcomes:

Students will learn how to analyze structure and properties of organic, inorganic and biomolecular compounds by 1D and 2D proton and carbon NMR spectra, quantitative NMR analysis, and practical applications in various fields of science and technology.

#### **Brief outline of the course:**

Theoretical principles of nuclear magnetic resonance (NMR), basic NMR pulse techniques and Fourier transformation, NMR spectrometers, description of NMR by vector models. Parameters of one- (1D) and two-dimensional (2D) NMR spectra, practical application of 1H and 13C NMR spectra and basic correlated 2D spectra for structure and stereochemical arrangement, elucidation of reaction mechanisms, molecular dynamics, physico-chemical properties and quantitative analysis of chemical compounds.

#### **Recommended literature:**

1. Friebolin H.: Basic One- and Two-Dimensional NMR Spectrocopy, 5. Ed., Wiley, 2010.

2. T. D. W. Claridge: High-Resolution NMR Techniques in Organic Chemistry, Elsevier, 1999.

3. Atta-ur-Rahman, M. I. Choudhary: Solving Problems with NMR spectroscopy, Academic Press 1996.

4. H.-O. Kalinowski, S. Berger, S. Braun: Carbon-13 NMR Spectroscopy. Wiley, New York 1988.

5. A. E. Derome: Modern NMR Techniques for Chemistry Research. Pergamon Press, Oxford 1987.

6. E. Pretsch, B. Buhlmann, C. Affolter: Structure Determination of Organic Compounds. Tables of Spectral Data. Springer Verlag, Berlin 2000.

7. E. Breitmaier: Structure Elucidation by NMR in Organic Chemistry: A Practical Guide, 3rd Ed., Wiley, 2002.

8. E. Breitmaier, W. Voelter: Carbon-13 NMR Spectroscopy. VCH Weinheim, 1990.

8. E. Breitmaie	r, W. Voelter: Car	bon-13 NMR Sp	ectroscopy. VCH	I Weinheim, 199	0.				
Course langua	ge:								
Notes:									
<b>Course assessn</b> Total number o	nent f assessed studen	ts: 160							
А	A B C D E FX								
38.75	38.75 25.0 23.75 10.63 1.88 0.0								
Provides: doc.	RNDr. Ján Imrich	n, CSc.							
Date of last mo	dification: 03.05	5.2015							
Approved: pro:	f. RNDr. Jozef Go	onda, DrSc.							

University: P. J.	. Safárik Univers	ity in Košice						
Faculty: Faculty	y of Science							
<b>Course ID:</b> KFa AFS/05	Course ID: KFaDF/ Course name: Ancient Philosophy and Present Times AFS/05							
Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 2 Per study period: 28 Course method: present								
Number of EC	<b>FS credits:</b> 2							
Recommended	semester/trimes	ster of the cours	e: 2.					
Course level: II	•							
Prerequisities:								
Conditions for	course completi	on:						
Learning outco	mes:							
Brief outline of	the course:							
Recommended	literature:							
Course languag	ge:							
Notes:								
Course assessment Total number of assessed students: 31								
А	В	С	D	Е	FX			
80.65	6.45	6.45	0.0	6.45	0.0			
Provides: Doc.	Provides: Doc. PhDr. Peter Nezník, CSc.							
Date of last mo	dification: 12.02	2.2020						
Approved: prof	. RNDr. Jozef G	onda, DrSc.						

University: P. J.	Šafárik Univers	ity in Košice						
Faculty: Faculty	of Science							
Course ID: ÚCHV/ Course name: Asymmetric synthesis AS1/03								
Course type, scope and the method: Course type: Lecture / Practice Recommended course-load (hours): Per week: 2 / 1 Per study period: 28 / 14 Course method: present								
Number of EC	<b>S credits:</b> 5	4 641						
Recommended	Recommended semester/trimester of the course:							
Course level: II.								
Prerequisities:								
Conditions for o	course completi	on:						
Learning outco	mes:							
Brief outline of	the course:							
Recommended	Recommended literature:							
Course languag	je:							
Notes:								
Course assessment Total number of assessed students: 131								
A	В	С	D	Е	FX			
69.47	19.85	6.11	2.29	2.29	0.0			
Provides: prof.	Provides: prof. RNDr. Jozef Gonda, DrSc.							
Date of last mo	dification: 27.03	3.2020						
Approved: prof	Approved: prof. RNDr. Jozef Gonda, DrSc.							

University: P. J. Šafárik University in Košice								
Faculty: Facult	y of Science							
Course ID: ÚC ZCI/04	HV/ Course na	me: Basic chem	informatics tool	S				
Course type, scope and the method: Course type: Lecture / Practice Recommended course-load (hours): Per week: 2 / 1 Per study period: 28 / 14 Course method: present								
Number of ECTS credits: 2								
Recommended	semester/trimes	ster of the cours	e:					
Course level: II	•							
Prerequisities:								
<b>Conditions for</b> 3 individual pro	<b>course completi</b> ojects	on:						
Learning outcomes: Introductory course aimed at introducing students to the fundamental informatics techniques for chemistry-related disciplines. The class will cover a wide range of topics, including representation and use of chemical structure information, computer-aided drug design, 3D visualization and computation, and handling of large volumes of chemical information. Brief outline of the course: Representing 2D structures, 2D chemical database applications, Advanced 2D descriptors, Depresenting 2D structures, 2D chemical database applications, Advanced 2D descriptors,								
systems, Electro web service tec	onic laboratory n hnologies for che	otebooks, Chem emical information	ical informatics	software develop	oment,Emerging			
Recommended literature: Johann Gasteiger & Thomas Engel (eds.), Chemoinformatics: A Textbook. Wiley-VCH, Weinheim, 2003 Andrew Leach & Valerie Gillet, An Introduction to Chemoinformatics. Kluwer Academic Publishers, Dordrecht, NL, 2003.								
Course language: slovak language and english language								
Notes:								
Course assessment Total number of assessed students: 0								
А	В	С	D	E	FX			
0.0	0.0	0.0	0.0	0.0	0.0			
Provides: RND	r. Monika Tvrdoi	ňová, PhD.		<u>.</u>				
Date of last mo	dification: 03.05	5.2015						

Approved: prof. RNDr. Jozef Gonda, DrSc.

University. F. J. Salarik University in Rusice	University	P. J.	Šafárik	University in	Nošice
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Faculty: Faculty of Science

Course ID: ÚCHV/	Course name: Bioorganic chemistry
BOC/03	

Course type, scope and the method: Course type: Lecture Recommended course-load (hours): Per week: 3 Per study period: 42

Course method: present

**Number of ECTS credits:** 5

**Recommended semester/trimester of the course:** 

Course level: II.

Prerequisities:

**Conditions for course completion:** 

Examinationn

#### Learning outcomes:

Explanation of fundamental principles for the construction of bioorganic molecular models of biochemical precesses using the tools of organic chemistry.

#### **Brief outline of the course:**

1. Introduction: Basic consideration, proximity effects in biochemistry, Molecular adaptation, Molecular recognition at the supramolecular level.

2. Bioorganic Chemistry of amino acids and polypeptides: Chemistry of the living cells, Analogy between organic reactions and biochemical tranformations, Chemistry of the peptide bond, Nonribosomal peptide formation, Asymmetric synthesis od amino acids, Asymmetric synthesis with chiral organometalic catalysts, Transition state analogs, Antibodies as enzymes, Chemical mutations, Molecular recognition and Drug design.

3. Bioorganic Chemistry of the Phosphate groups and polynucleotides: Energy storage, DNA intercalates, RNA molecules as catalysts.

4. Enzyme Chemistry: Introduction to catalysis and enzymes, Multifuntional catalysis and Simple models, alfa-Chymotrypsin, Other hydrolytic enzymes, Strereoelectronic control in hydrolytic reactions, Immobilized enzymes, Enzymes in synthetic organic chemistry, Enzyme-Analog-Built polymers, Design of molecular clefts.

5. Enzyme Models: Host-Guest complexation chemistry, New development in crown ether chemistry, Membrane chemistry and micelles, Polymers, Cyclodextrins, Enzyme design using steroid template, Remote functionalisation reactions, Polyene biomimetic cyclisations.

6. Metal Ions: Metal ions in proteins and biological molecules, Carbopeptidase A, Hydrolysis of amino acid esters and peptides, Iron and oxygen transport, Cooper ion, Cobalt and vitamin B12 action, Oxidoreduction, Pyridoxal phosphate, Biotin.

#### **Recommended literature:**

Voet J. : Biochemistry, Springer Verlag, 1998 Dugas H.: Bioorganic Chemistry, Springer Verlag, 1999.

#### Course language:

Notes:							
Course assessment Total number of assessed students: 157							
A B C D E FX							
82.8 5.1 7.01 3.82 1.27 0.0							
Provides: prof. RNDr. Jozef Gonda, DrSc.							
Date of last modification: 03.05.2015							
Approved: prof	f. RNDr. Jozef Go	onda, DrSc.					

University: P. J	. Šafárik Univers	sity in Košice					
Faculty: Faculty	y of Science						
Course ID: KFaDF/ KDF/05Course name: Chapters from History of Philosophy of 19th and 20th Centuries (General Introduction)							
Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 2 Per study period: 28 Course method: present							
Number of EC	TS credits: 2						
Recommended	semester/trime	ster of the cours	e: 2.				
Course level: II	- 						
Prerequisities:							
<b>Conditions for</b>	course complet	ion:					
Learning outco	omes:						
Brief outline of	the course:						
Recommended	literature:						
Course languag	ge:						
Notes:							
Course assessment Total number of assessed students: 10							
А	В	С	D	Е	FX		
50.0	20.0	10.0	0.0	10.0	10.0		
Provides: doc. 1	Provides: doc. PhDr. Pavol Tholt, PhD., mim. prof.						
Date of last mo	dification: 03.03	5.2015					
Approved: prof	. RNDr. Jozef G	onda, DrSc.					

University P I Šafá	rik University in Košice				
Faculty: Faculty of S	cience				
Caura ID: ÚCHV/	Course nome: Chemical n	matashnala ay			
Course ID: UCHV/ CHN/09	Course name: Chemical ha	anotecnnology			
Course type, scope and the method: Course type: Lecture / Practice Recommended course-load (hours): Per week: 2 / 0 Per study period: 28 / 0 Course method: present					
Number of ECTS cr	edits: 4				
Recommended seme	ster/trimester of the cours	e: 4.			
Course level: II.					
Prerequisities:					
Conditions for cours	e completion:				
Learning outcomes: Students will be fami in creation and applic	iliar with modern trends in t cation of nanostructured mat	he area of nanotechnology and role of chemistry erials and devices.			
<b>Brief outline of the c</b> Modern trends in nan- and switchable polyn photonics.	ourse: otechnology, in particular na ners, sensors and biosensors	noparticles, nanotubes and fullerenes, conducting DNA nanostructures, molecular electornics and			
Recommended litera 1. Lectures handouts 2. Steed, J. W.; Turne nanochemistry; John 3. Rao, C. N. R.; Mul Weinheim 2007.	<ul> <li>Recommended literature:</li> <li>1. Lectures handouts can be found at http://lms.upjs.sk/course/view.php?id=388</li> <li>2. Steed, J. W.; Turner, D. R. Wallace, K. J. Core concepts in supramolecular chemistry and nanochemistry; John Wiley &amp; sons, Chichester 2007.</li> <li>3. Rao, C. N. R.; Muller, A.; Cheetham, A. K. Nanomaterials Chemistry; WILEY-VCH Weinheim 2007</li> </ul>				
Course language:					
Notes:					
Course assessment Total number of assessed students: 4					
abs n					
100.0 0.0					
Provides: RNDr. Martin Walko, PhD.					
Date of last modifica	tion: 06.02.2020				
Approved: prof. RNI	Approved: prof. RNDr. Jozef Gonda, DrSc.				

University: P. J. Ša	fárik Univers	sity in Košice				
Faculty: Faculty of	Science					
<b>Course ID:</b> ÚCHV PRL/04	<b>rse ID:</b> ÚCHV/ <b>Course name:</b> Chemistry of natural compounds					
Course type, scope Course type: Lect Recommended co Per week: 2 / 1 Pe Course method: p	and the me ure / Practice urse-load (her study perio	thod: e nours): nod: 28 / 14				
Number of ECTS	credits: 4					
Recommended sen	nester/trime	ster of the cours	e:			
Course level: II.						
Prerequisities:						
<b>Conditions for cou</b> Seminar report and	rse complet its presentat	<b>ion:</b> ion by oral form.	Terminal exami	nation by written	form.	
Learning outcome General review of metabolites (alkaka	s: the soma loids and tep	selected groups prenoids) and their	of natural pro r biosynthetic pa	ducst, especially athways.	the secondary	
Primary and second of shikimic and leve saccharides, Nome Oligosaccharides, glycosphingolipids Alkaloids, their clar their biosynthetic p	dary metabol valonic acid nclature of c and polysacc , their biosth ssification. F athways. Ter	lism. Secondary in as intermediates arbphydrates an charides. Chemis nesis and metabol Protoalkaloids, tro penoids. Biosynt	metabolites an the of biosynthesis its stereochemis try of lipids, the lism. Prostaglan opane alkaloids, hesis of monoter	heir building block of building block try. Monosacchar heir classification dins. Amino acid inole alkaloids, c rpens, sesquiterpe	eks. Biosyntheis es. Chemistry of ride derivatives. , sphingolipids, ds and peptides. opiate alkaloids, ens, diterpens.	
Recommended lite 1.S. V. Bhat, B. A. 2005, ISBN 81-731 2.P. M. Dewick: M 0471496405 3.P. M. Dewick: M and Sons, Ltd. 200	rature: Nagasampag 9-481-5. edicinal Natu edicinal Natu 9, England, I	;i, M. Sivakumar: 1ral Products, Joh 1ral Products: A H SBN: 978-0-470-	Chemistry of N in Wiley and Son Bisynthetic Appr 74168-9.	latural Products, S ns, Ltd. 2002, Eng roach, 3rd Edition	Springer Narosa gland, ISBN: n, John Wiley	
Course language:	Course language:					
Notes:						
Course assessment Total number of assessed students: 107						
A	В	С	D	Е	FX	
61.68	16.82	14.02	4.67	1.87	0.93	
Provides: doc. RNI	Dr. Miroslava	a Martinková, Ph	D.			

**Date of last modification:** 03.05.2015

Approved: prof. RNDr. Jozef Gonda, DrSc.

University: P. J. Šafá	rik University in Košice			
Faculty: Faculty of S	cience			
Course ID: ÚCHV/ ROP/15	Course name: Class Proje	ct		
Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 6 Per study period: 84 Course method: present				
Number of ECTS cr	edits: 6			
Recommended seme	ster/trimester of the cours	e:		
Course level: II.				
Prerequisities:				
<b>Conditions for cours</b> Experimental work presentation, seminar	e completion: in physical chemistry labors and scientific meetings.	ratory, evaluation of results, discussion, results		
<b>Learning outcomes:</b> Project work and pres	sentation.			
<b>Brief outline of the c</b> Experimental work in and discussion about	ourse: research field for master deg	gree . Evaluation of results and verbal presentation		
Recommended litera	iture:			
Course language:				
Notes:				
Course assessment Total number of asses	ssed students: 48			
	abs	n		
	100.0	0.0		
<b>Provides:</b> prof. RNDr. Andrej Oriňak, PhD., prof. RNDr. Renáta Oriňaková, DrSc., RNDr. Andrea Morovská Turoňová, PhD., doc. RNDr. Andrea Straková Fedorková, PhD., prof. Mgr. Vasil' Andruch, DSc., prof. Dr. Yaroslav Bazel', DrSc., doc. Ing. Viera Vojteková, PhD., doc. RNDr. Taťána Gondová, CSc., doc. RNDr. Katarína Reiffová, PhD., prof. RNDr. Jozef Gonda, DrSc.				
Date of last modification: 26.09.2017				
Approved: prof. RNDr. Jozef Gonda, DrSc.				

University: P. J. Šafá	University: P. J. Šafárik University in Košice				
Faculty: Faculty of S	cience				
Course ID: Course name: Communication and Cooperation KPPaPZ/KK/07					
Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 2 Per study period: 28 Course method: present					
Number of EC18 cr					
Recommended seme	ster/trimes	ster of the course: 3.			
Course level: 11.					
Prerequisities:					
Conditions for cours	e completi	on:			
Learning outcomes:					
Brief outline of the c	ourse:				
Recommended litera	iture:				
Course language:					
Notes:					
Course assessment Total number of assessed students: 281					
abs		n	Z		
98.22 1.78 0.0					
Provides: Mgr. Ondrej Kalina, PhD., Mgr. Lucia Hricová, PhD.					
Date of last modifica	Date of last modification: 04.09.2019				
Approved: prof. RNI	Dr. Jozef Go	onda, DrSc.			

	COURSE INFORMATION LETTER
University: P. J. Šafá	rik University in Košice
Faculty: Faculty of S	cience
Course ID: ÚCHV/ KC/03	Course name: Cosmetic chemistry
Course type, scope a Course type: Lectur Recommended cour Per week: 2 / 1 Per Course method: pre	nd the method: re / Practice rse-load (hours): study period: 28 / 14 esent
Number of ECTS cr	edits: 4
Recommended seme	ster/trimester of the course:
Course level: II.	
Prerequisities:	
<b>Conditions for cours</b> Seminar report on the with discussion. Term	<b>be completion:</b> e selected subjects of cosmetic chemistry and its oral presentation connected ninal examination by oral form.
Learning outcomes: The basic chemical construction of some industry.	ingredients in cosmetic products, their isolation from natural sources. The interesting groups of the orgnaic structures and their application in cosmetic
Brief outline of the c Skin and its compor glycerophospholipids alcohols, natural and classification, organi (amino acids, peptic ingredients. The cher acid, their biosynthes	ourse: nents. The chemistry of lipids. Lipids, their classification (triacylglycerols, and sfingophoslipids), liposomes as transport systems. Fatty acids and synthetic waxes. Surfactants, their classification. Antioxidants. Dyes, their c and inorganic dyes, natural and synthetic. Biological active compounds des, proteins hydroxy acids, vitamins, polysaccharides) as the cosmetic mistry of fragrances. Compounds derived from shikimic acid and mevalonic sis, Synthetic fragrances and their construction.
Recommended litera 1. S. V. Bhat, B. A. N Narosa 2005, ISBN 8	<b>Iture:</b> Jagasampagi, M. Sivakumar: Chemistry of Natural Products, Springer 31-7319-481-5.

2. G. Ohloff: Scent and Fragrances, Springer-Verlag Berlín Heidelberg 1994, ISBN 3-540-57108-6.

3. D. H. Pybus, CH. S. Sell: The chemistry of fragrances, Royal Society of Chemistry 1999, ISBN 0-8540-528-7.

4. J. McMurry: Organic chemistry, Brooks/Cole, a Thomson Learning Company 2004, Sixth Eddition, ISBN 0534389996.

### **Course language:**

Notes:

Course assessment Total number of assessed students: 86						
A B C D E FX						
79.07	15.12	4.65	1.16	0.0	0.0	
Provides: doc. ]	Provides: doc. RNDr. Miroslava Martinková, PhD.					
Date of last modification: 06.02.2020						
Approved: prof. RNDr. Jozef Gonda, DrSc.						

University: P. J.	. Šafárik Univers	sity in Košice			
Faculty: Faculty	y of Science				
Course ID: ÚCHV/ Course name: Defence of Diploma Thesis ODPFC/01					
Course type, sc Course type: Recommended Per week: Per Course metho	ope and the me d course-load (h r study period: d: present	thod: lours):			
Number of EC	<b>FS credits:</b> 20				
Recommended	semester/trime	ster of the cours	e:		
Course level: II	•				
Prerequisities:					
Conditions for	course complet	ion:			
Learning outco	mes:				
Brief outline of	the course:				
Recommended	literature:				
Course languag	ge:				
Notes:					
Course assessm Total number of	<b>ent</b> f assessed studer	nts: 45			
А	В	С	D	Е	FX
88.89 8.89 2.22 0.0 0.0 0.0					
Provides:					L
Date of last mo	dification: 03.03	5.2015			
Approved: prof	. RNDr. Jozef G	onda, DrSc.			

University: P. J.	. Šafárik Univers	sity in Košice				
Faculty: Faculty	y of Science					
Course ID: ÚCHV/ SEM1a/00Course name: Diploma work seminar						
Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 2 Per study period: 28 Course method: present						
Number of EC	<b>TS credits:</b> 2					
Recommended	semester/trime	ster of the cours	e:			
Course level: II	- -					
Prerequisities:						
Conditions for	course complet	ion:				
Learning outco	omes:					
Brief outline of	the course:					
Recommended	literature:					
Course languag	ge:					
Notes:						
Course assessment Total number of assessed students: 111						
А	A B C D E FX					
100.0 0.0 0.0 0.0 0.0 0.0						
Provides: RNDr. Ladislav Janovec, PhD.						
Date of last mo	Date of last modification:					
Approved: prof	Approved: prof. RNDr. Jozef Gonda, DrSc.					

University: P. J.	. Šafárik Univers	ity in Košice			
Faculty: Faculty	y of Science				
Course ID: ÚC SEM1b/00	HV/ Course na	ame: Diploma wo	ork seminar		
Course type, sc Course type: H Recommended Per week: 2 Pe Course metho	ope and the me Practice d course-load (h er study period: d: present	thod: ours): 28			
Number of EC	<b>FS credits:</b> 2				
Recommended	semester/trimes	ster of the cours	e:	_	
Course level: II	•				
Prerequisities:	ÚCHV/SEM1a/(	00			
Conditions for	course completi	on:			
Learning outco	mes:				
Brief outline of	the course:				
Recommended	literature:				
Course languag	ge:				
Notes:					
Course assessm Total number of	Course assessment Total number of assessed students: 97				
А	В	C	D	Е	FX
100.0 0.0 0.0 0.0 0.0 0.0					
Provides: RNDr. Ladislav Janovec, PhD.					
Date of last mo	dification: 06.02	2.2020			
Approved: prof	. RNDr. Jozef G	onda, DrSc.			

University: P. J	. Šafárik Univers	sity in Košice				
Faculty: Facult	y of Science					
Course ID: ÚC EMDP/03	Course ID: ÚCHV/ EMDP/03Course name: Experimental Methods to Master's Thesis					
Course type, so Course type: D Recommended Per week: 6 P Course metho	cope and the me Practice d course-load (h er study period: d: present	<b>thod:</b> nours): : 84				
Number of EC	TS credits: 6					
Recommended	semester/trime	ster of the cours	e:			
Course level: II	[					
Prerequisities:						
<b>Conditions for</b>	course complet	ion:				
Learning outco	omes:					
Brief outline of	the course:					
Recommended	literature:					
Course languag	ge:					
Notes:						
<b>Course assessm</b> Total number o	nent f assessed studer	nts: 368	-			
Α	В	С	D	Е	FX	
94.29	3.8	0.54	0.54	0.82	0.0	
Provides: RND DrSc., doc. RNI Antalík, DrSc., RNDr. Jozef Go doc. RNDr. Taťa Oriňaková, DrS Vladimír Zeleňá RNDr. Miroslav Tomášková, PhI Daniela Kladeko RNDr. Danica S prof. Mgr. Vasil doc. Ing. Viera	r. Martin Vavra, Dr. Ján Imrich, C prof. RNDr. Jura onda, DrSc., prof. ána Gondová, CS c., doc. RNDr. Iv ák, DrSc., doc. R va Matiková-Maľ D., RNDr. Andre ová, CSc., RNDr Sabolová, PhD., I ' Andruch, DSc., Vojteková, PhD.	PhD., doc. RNDr. Sc., doc. RNDr. j Černák, DrSc., RNDr. Andrej C Sc., doc. RNDr. M /an Potočňák, Ph NDr. Viktor Vígl arová, PhD., doc a Morovská Turc Slávka Hamuľa RNDr. Zuzana Ku prof. Dr. Yarosla	r. Peter Pristaš, C Mária Kožurkova prof. RNDr. Kata Driňak, PhD., doc Airoslava Martin D., doc. RNDr. E aský, PhD., doc. aský, PhD., doc. NOr. Juraj Ku pňová, PhD., RNI ková, PhD., RNI udličková, PhD., w Bazeľ, DrSc., 1	Sc., doc. RNDr. á, CSc., prof. Ing arína Györyová, f e. RNDr. Zuzana ková, PhD., prof. crik Sedlák, PhD. RNDr. Katarína achár, PhD., RNI Dr. Dušan Koščíl Dr. Rastislav Varl RNDr. Lívia Ko RNDr. Ladislav J	Peter Javorský, . Marián DrSc., prof. Vargová, Ph.D., . RNDr. Renáta , prof. RNDr. Reiffová, PhD., Dr. Nataša k, CSc., RNDr. hač, PhD., cúrová, PhD., Janovec, PhD.,	
Date of last mo	dification: 03 04	5 2015				

Approved: prof. RNDr. Jozef Gonda, DrSc.

University: P. J.	Šafárik Univers	ity in Košice				
Faculty: Faculty	of Science					
Course ID: ÚCH PCH1/00	HV/ Course na	me: Food chemi	stry			
Course type, sco Course type: L Recommended Per week: 2 / 1 Course method	ope and the met ecture / Practice course-load (h Per study perio l: present	thod: ours): od: 28 / 14				
Number of ECT	S credits: 4					
Recommended s	semester/trimes	ster of the cours	e: 3.			
Course level: 1.,	11.					
Prerequisities:						
Conditions for c	ourse completi	on:				
Learning outcor Students will re importance and o	<b>nes:</b> ecieve informati chemical change	ons and knowle es in food during	dges about ch processing and	emical substance storage.	es in food, their	
<b>Brief outline of</b> the main category carbohydrates. We colorants, toxic of	<b>the course:</b> ries of substance Vater, minerals, l compounds, adit	s in the most important important in the most important in the most important is the most important in the most important in the most important is the most important in the most important in the most important is the most important in the most important important important in the most important impo	ortant group of anorganic con eactions in dair	food. Aminoacids npounds, vitamins y products.	, proteins, lipids, s. Hydrocarbons,	
Recommended I	literature:					
Course language	e:					
Notes:						
Course assessme Total number of	Course assessment Total number of assessed students: 256					
А	В	С	D	E	FX	
60.55	60.55 33.98 5.08 0.0 0.0 0.39					
Provides: RNDr.	. Ján Elečko, Ph	D.			•	
Date of last mod	lification: 11.09	0.2017				
Approved: prof.	RNDr. Jozef Go	onda, DrSc.				

University: P. J.	Šafárik Univers	ity in Košice			
Faculty: Faculty	Faculty: Faculty of Science				
Course ID: ÚC HZ1/00	Course ID: ÚCHV/ HZ1/00Course name: Heterocyclic compounds				
Course type, scope and the method: Course type: Lecture / Practice Recommended course-load (hours): Per week: 2 / 1 Per study period: 28 / 14 Course method: present					
Number of EC	<b>FS credits:</b> 4				
Recommended	semester/trimes	ster of the cours	e:	_	
Course level: II					
Prerequisities:					
<b>Conditions for</b> Two tests at sen Written exam.	<b>course completi</b> ninars.	on:			
<b>Learning outco</b> Goal of the sub synthesis, chem	mes: oject is to afford ical and biologic	I the basic infor al properties of I	mation about oc	currence, practic pounds.	al significance,
Brief outline of Preparation and and non-aroma synthesis. Natur heterocycles and	the course: I propertieis of v tic compounds, ral compounds co d their synthesis.	various types of including their ontaining heteroc	heterocycles. Att biological proper cycles, biological	tention will be p ties and applica activity and drug	aid to aromatic tion in organic s on the base of
Recommended 1. Gilchrist T.L. 2. Eichler T., Ha Application. Se	<ul> <li>Recommended literature:</li> <li>1. Gilchrist T.L.: Heterocyclic Chemistry, Longman Harlow 1992.</li> <li>2. Eichler T., Hauptmann S.: The Chemistry of Heterocycles. Structure, Reactions, Synthesis and Application. Second Edition, WILEY-VCH, Weinheim, 2003.</li> </ul>				
Course languag Slovak	Course language: Slovak				
Notes:					
Course assessment Total number of assessed students: 138					
А	В	С	D	Е	FX
57.25 26.81 10.87 3.62 1.45 0.0					
Provides: RND	r. Mariana Budov	vská, PhD.			
Date of last mo	dification: 24.01	.2020			
Approved: prof	. RNDr. Jozef G	onda, DrSc.			

University: P. J.	Šafárik Univers	ity in Košice				
Faculty: Faculty	of Science					
<b>Course ID:</b> KFa DF2p/03	DF/ Course na	me: History of I	Philosophy 2 (Ge	eneral Introduction	on)	
Course type, sc Course type: L Recommended Per week: 2 / 1 Course method	ope and the met Lecture / Practice I course-load (h Per study perio d: present	thod: ours): od: 28 / 14				
Number of ECT	Number of ECTS credits: 4					
Recommended	semester/trimes	ster of the cours	e:			
Course level: I., II.						
Prerequisities:						
Conditions for a	course completi	on:				
Learning outco	mes:					
Brief outline of	the course:					
Recommended	literature:					
Course languag	je:					
Notes:						
Course assessm Total number of	ent assessed studen	ts: 739				
A	В	С	D	Е	FX	
60.89	13.8	12.58	8.66	3.38	0.68	
Provides: doc. F Katarína Mayero	PhDr. Pavol Thol ová, PhD., doc. N	t, PhD., mim. pro ⁄Igr. Róbert Stojk	of., Doc. PhDr. I ca, PhD.	eter Nezník, CS	c., PhDr.	
Date of last mo	dification: 25.03	3.2020				
Approved: prof	. RNDr. Jozef Go	onda, DrSc.				

University: P. J.	Šafárik Univers	sity in Košice				
Faculty: Faculty	Faculty: Faculty of Science					
<b>Course ID:</b> KFa IH2/03	aDF/ <b>Course na</b>	ame: Idea Humai	nitas 2 (General I	Introduction)		
Course type, sc Course type: F Recommended Per week: 2 Pe Course method	ope and the met Practice I course-load (h er study period: d: present	thod: ours): 28				
Number of ECTS credits: 2						
Recommended	Recommended semester/trimester of the course: 3.					
Course level: II.						
Prerequisities:	Prerequisities:					
Conditions for	course completi	ion:				
Learning outco	mes:					
Brief outline of	the course:					
Recommended	literature:					
Course languag	ge:					
Notes:						
Course assessm Total number of	ent f assessed studen	its: 8				
A	В	С	D	Е	FX	
87.5	12.5	0.0	0.0	0.0	0.0	
Provides: Doc.	PhDr. Peter Nezi	ník, CSc.				
Date of last mo	dification: 12.02	2.2020				
Approved: prof	. RNDr. Jozef G	onda, DrSc.		_		

University: P. J	. Šafárik Univers	sity in Košice					
Faculty: Facult	y of Science						
Course ID: ÚC FMCH/04	HV/ Course na	ame: Medicinal c	hemistry				
Course type, sc Course type: 1 Recommended Per week: 3 / 1 Course metho	cope and the me Lecture / Practice d course-load (h l Per study peri d: present	thod: e iours): od: 42 / 14					
Number of EC	Number of ECTS credits: 6						
Recommended	semester/trime	ster of the cours	e:				
Course level: II	•			_			
Prerequisities:							
<b>Conditions for</b> Two tests at sen	<b>course complet</b> ninars, Written e	<b>ion:</b> xam					
Explanation of of structure-acti chemical and p the present state or antitumor dru	basic principles ivity relationship hysico-chemical e in the field of ugs.	in the research an s including space properties influe selected importan	d development o structure and chi encing biological t groups of drug	f chemical drugs irality and their c activity. Gaining s, such as antibac	, understanding onsequences on g knowledge of cterial, antiviral		
Brief outline of Introduction, cl generation, drug of central, per compounds, and	the course: assification of d g chirality, search ipheral and veg titussives and ex	rugs, factors influ for new drugs, sugetative nervous pectorants, disinf	uencing design a tructure-activity i system, antibac ectants.	nd activity of dr relationships, che cterial, antitumo	ugs of the third motherapeutics r and antiviral		
Recommended 1. Medicinal Ch Chemistry, Tho 2. Advances in 3. Gareth T.: M	literature: nemistry: Princip mas Graham Ho Drug Discovery edicinal Chemis	les and Practice, use, Cambridge, Techniques: Harv try: An introducti	King F. D., Ed., 7 1994. vey A. L., Ed., W on. John Willey 6	The Royal Societ /iley & Sons, Chi & Sons, 2000.	ty of ichester, 1998.		
Course language: Slovak							
Notes:	Notes:						
Course assessm Total number of	nent f assessed studer	nts: 114					
А	В	С	D	Е	FX		
58.77	20.18	14.91	3.51	1.75	0.88		
Provides: RND	r. Mariana Budo	vská, PhD., RND	r. Zuzana Kudlič	ková, PhD.			
Date of last mo	dification: 24.0	1.2020					

Approved: prof. RNDr. Jozef Gonda, DrSc.

University: P. J.	. Šafárik Univers	ity in Košice			
Faculty: Faculty of Science					
Course ID: ÚCHV/       Course name: Modern synthetic methods         MSM1/00					
Course type, sc Course type: I Recommended Per week: 3 / 1 Course method	ope and the met Lecture / Practice I course-load (h Per study perio d: present	hod: ours): od: 42 / 14			
Number of ECTS credits: 6					
Recommended	semester/trimes	ster of the cours	e:		
<b>Course level:</b> II					
Prerequisities:					
<b>Conditions for</b> Seminar written	<b>course completi</b> discussion. Terr	<b>on:</b> ninal examinatio	n by written for	m.	
<b>Learning outco</b> Understanding	mes: of modern metho	ds in the synthes	is of organic co	mpounds.	
Its purpose is molecules that retrosynthetic a oxidation, reduc	to convey know play important nalysis of simple ction, protection	vledge about co roles in moder organic molecu of functional gro	ncepts, method n organic syntl les, asymmetric ups.	s, starting mater nesis. The concept synthesis, nucleo	ials, and target of of synthons, ophilic addition,
Recommended 1. T. W. Green, Sons, Inc. 1999 2. B. M. Trost, I Oxford 1991. 3. B. Carruthers University Press 4. G. S. Zweifel NY, ISBN: 0-71 5. J. Fuhrhop, G	literature: P. G. M. Wuts: P , ISBN: 0-471-22 I. Fleming I.: Con s, I. Coldham: Mo s 2004, UK, ISB I, M. H. Nantz: M .67-7266-3. G. Penzlin: Organ	Protective groups 2057-4. mprehensive org odern methods o N: 0-521-77097- Iodern Organic S ic synthesis, VC	in organic synh anic synthesis, I f organic synthe 1. Synthesis, W. H. H Weinheim, 19	eis, third edition, Eds. Vol. 1-9. Perg sism 4th edition, 0 Freeman and Con	John Wiley and gamon Press, Cambridge mpany 2007,
Course languag	ge:				
Notes:					
Course assessme Total number of	ent f assessed studen	ts: 128			
А	В	С	D	Е	FX
57.03	20.31	13.28	7.81	1.56	0.0
Provides: prof.	RNDr. Jozef Gor	nda, DrSc., doc.	RNDr. Miroslav	a Martinková, Ph	D.
Date of last mo	dification: 27.03	.2020			

Approved: prof. RNDr. Jozef Gonda, DrSc.

University: P. J. S	Šafárik Univers	ity in Košice				
Faculty: Faculty	of Science					
Course ID: ÚCHV/ Course name: Molecular modeling MM1/00						
Course type, sco Course type: Le Recommended Per week: 1 / 3 Course method	pe and the met ecture / Practice course-load (he Per study perio : present	hod: ours): od: 14 / 42				
Number of ECTS credits: 4						
Recommended semester/trimester of the course:						
Course level: II.						
Prerequisities:						
<b>Conditions for co</b> Verbal examination	ourse completion on and the semi	on: nar project				
Learning outcom Basic skills and the using specialized the structure and thermodynamical	hes: heory necessary l software pack electronic pro and structural	for the realisation kages. Students perties of the sn aspects of the che	on of the compu- will be able t nalll and midd emical reaction	atational experime to perform theore le-sized molecules is.	nts in chemistry tical studies of s and study the	
Brief outline of t Building and vis minimum energy Methods in mole principles and use	he course: sualization of structure. The cular mechanics e of molecular of	chemical structu oretical studies of s and semi-empir lynamics. Confo	res. Structure of reaction medical methods. A rmational analy	optimization and chanisms and cher Ab initio and DFT ysis.	calculation of mical reactions. methods. Basic	
Recommended li 1. LEACH, Andr 2. JENSEN, Fran 3. Manuals for M	terature: ew R.: Molecul k: An Introduct OPAC, HYPEF	ar Modelling: Pr ion to Computat: RCHEM, GAME	inciples and Aj ional Chemistr SS, GAUSSIA	oplications. y. N.		
Course language slovak language a	: and english lang	guage				
Notes:						
<b>Course assessme</b> Total number of a	<b>nt</b> assessed studen	ts: 71				
A	В	С	D	E	FX	
80.28	19.72	0.0	0.0	0.0	0.0	
Provides: RNDr.	Ladislav Janov	ec, PhD.				
Date of last modi	ification: 03.05	.2015				
Approved: prof.	RNDr. Jozef Go	onda, DrSc.				

University: P. J.	University: P. J. Šafárik University in Košice					
Faculty: Faculty	Faculty: Faculty of Science					
<b>Course ID:</b> ÚC NMRP/14	HV/ Course n	ame: NMR prakt	ikum			
Course type, sc Course type: F Recommended Per week: 3 Pe Course metho	ope and the me Practice d course-load (h er study period d: present	thod: nours): : 42				
Number of ECTS credits: 6						
Recommended semester/trimester of the course:						
Course level: II.						
Prerequisities:						
Conditions for	Conditions for course completion:					
Learning outco	mes:					
Brief outline of	the course:					
Recommended	literature:					
Course languag	ge:					
Notes:						
Course assessm Total number of	ent f assessed studer	nts: 52				
А	В	C	D	Е	FX	
100.0	0.0	0.0	0.0	0.0	0.0	
Provides: doc. RNDr. Ján Imrich, CSc.						
Date of last mo	dification: 03.0	5.2015				
Approved: prof	. RNDr. Jozef G	onda, DrSc.		-		

University: P. J.	University: P. J. Šafárik University in Košice					
Faculty: Faculty	Faculty: Faculty of Science					
Course ID: ÚC NCH1/00	HV/ Course na	ame: Neurochem	istry			
Course type, sc Course type: I Recommended Per week: 2 / 1 Course method	ope and the met Lecture / Practice I course-load (h Per study peri d: present	thod: cours): od: 28 / 14				
Number of ECTS credits: 4						
Recommended semester/trimester of the course:						
Course level: II.						
Prerequisities:	Prerequisities:					
Conditions for	course completi	ion:				
Learning outco	mes:					
Brief outline of	the course:					
Recommended	literature:					
Course languag	ge:					
Notes:				=		
Course assessm Total number of	ent f assessed studen	ıts: 24				
А	В	С	D	Е	FX	
66.67	20.83	8.33	4.17	0.0	0.0	
Provides: doc. RNDr. Miroslava Martinková, PhD.						
Date of last mo	dification: 27.03	3.2020				
Approved: prof	. RNDr. Jozef G	onda, DrSc.				

University: P. J. Šafá	rik University in Košice
Faculty: Faculty of S	cience
Course ID: ÚCHV/ OCHST/15	Course name: Organic chemistry
Course type, scope a Course type: Recommended cour Per week: Per stud Course method: pre	nd the method: rse-load (hours): ly period: esent
Number of ECTS cr	edits: 4
Recommended seme	ster/trimester of the course:
Course level: II.	
Prerequisities:	
Conditions for cours	se completion:
-	

Learning outcomes:

#### **Brief outline of the course:**

Reaction Mechanisms, Mechanisms of Organic Reactions Reactive Intermediates Ionic Reactions Radical Reactions Bond Energy Reaction Energetics Activation Energy Reaction Rates and Kinetics Thermodynamic and Chemical Stability Aromaticity Benzene and Other Aromatic Compounds Fused Benzene Ring Compounds Other Aromatic Systems Factors Required for Aromaticity Stereoisomers Chirality and Symmetry Enantiomorphism Polarimetry Optical Activity Designating the Configuration of Stereogenic Centers The Sequence Rule for Assignment of Configurations to Stereogenic Carbons Compounds Having Two or More Stereogenic Centers Stereogenic Nitrogen Fischer Projection Formulas Alkenes Electrophilic Additions Strong Brønsted Acids Lewis Acids (non-Proton Electrophiles) Electrophilic Halogen Reagents Other Electrophilic Reagents Reduction Oxidation Radical Additions Allylic Substitution Alkynes Addition Reactions Hydrogenation Electrophiles Hydration & Tautomerism Hydroboration Nucleophilile Addition & Reduction Acidity of Terminal Alkynes (Substitution of H) Alkyl Halides General Reactivity Substitution(of X) SN2 Mechanism SN1 Mechanism Elimination (of HX) Summary of Substitution vs. Elimination Substitution by Metals Elimination Reactions of Dihalides Alcohols Reactions of Alcohols Substitution of the Hydroxyl H Substitution of the Hydroxyl Group Elimination of Water Oxidation of Alcohols Reactions of Phenols Acidity of Phenols Ring Substitution of Phenols Oxidation to Quinones Aromatic compounds Electrophilic Substitution A Substitution Mechanism Reactions of Substituted Benzenes Reaction Characteristics Reactions of Disubstituted Rings Reactions of Substituent Groups Nucleophilic Substitution, Elimination & Addition Reactions Amines Basicity of Nitrogen Compounds Acidity of Nitrogen Compounds Important Reagent Bases Reactions of Amines Electrophilic Substitution at Nitrogen Preparation of 1°-Amines Preparation of 2° & 3°-Amines Reactions with Nitrous Acid Reactions of Aryl Diazonium Intermediates Elimination Reactions of Amines Oxidation States of Nitrogen Basic information: Aldehydes & Ketones Carboxylic Acids Carboxylic Derivatives Natural products, Saccharides, Aminoacids, Biologically active compounds Aldehydes & Ketones Natural Products Synthetic Preparation Properties of Aldehydes & Ketones Reversible Addition Reactions Hydration & Hemiacetal Formation Acetal Formation Imine Formation Enamine Formation Cyanohydrin

Formation Irreversible Addition Reactions Complex Metal Hydrides Organometallic Reagents Carbonyl Group Modification Wolff-Kishner Reduction Clemmensen Reduction Hydrogenolysis of Thioacetals Oxidations Reactions at the a-Carbon Mechanism of Electrophilic a-Substitution The Aldol Reaction Ambident Enolate Anions Alkylation of Enolate Anions Carboxylic Acids Natural Products Related Derivatives Physical Properties Preparation of Carboxylic Acids Reactions of Carboxylic Acids Salt Formation Substitution of Hydroxyl Hydrogen Substitution of the Hydroxyl Group Reduction & Oxidation Carboxylic Derivatives Reactions of Carboxylic Acid Derivatives Acyl Group Substitution Mechanism Reduction Catalytic Reduction Metal Hydride Reduction Diborane Reduction Reaction with Organometallic Reagents Reactions at the a Carbon Acidity of a C-H The Claisen Condensation Synthesis Applications Carbohydrates Glucose The Structure and Configuration of Glucose Anomeric Forms of Monosaccharides Glycosides Disaccharides Polysaccharides Lipids Fatty Acids Soaps & Detergents Fats & Oils Waxes Phospholipids Prostaglandins Terpenes Proteins and Amino Acids a-Amino Acids Reactions of Amino Acids Synthesis of Amino Acids Peptides & Proteins The Primary Structure of Peptides Secondary & Tertiary Structure of Large Peptides and Proteins Peptide Synthesis Nucleic Acids The Primary Structure of DNA The Secondary & Tertiary Structures of DNA RNA and Protein Synthesis

#### **Recommended literature:**

#### **Course language:**

#### Notes:

Course assessn	nent				
Total number o	f assessed studen	ts: 52			
А	В	С	D	Е	FX
63.46	28.85	5.77	0.0	1.92	0.0
Provides:					
Date of last mo	dification: 03.05	5.2015			
Annroved: prot	f RNDr Jozef G	onda DrSc			

<b>University:</b> P. J. Salarik University in KC	ošice
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Faculty: Faculty of Science

Course ID: ÚCHV/	<b>Course name:</b> Organic reaction kinetics
KOR1/00	

Course type, scope and the method: Course type: Lecture / Practice Recommended course-load (hours):

**Per week:** 2 / 1 **Per study period:** 28 / 14

**Course method:** present

Number of ECTS credits: 4

**Recommended semester/trimester of the course:** 

Course level: II.

Prerequisities:

#### Conditions for course completion:

Work at seminars. Homeworks: Calculations of kinetic and thermodynamic parameters of model reactions.

Terminal examination consists of responding 3 themes and 3 exercises connecting thus the theoretical knowledge with praktical solutions of problems.

#### Learning outcomes:

Adopting of principles and methodology of the kinetics of organic reactions and their utilization for kinetic measurements of main types of chemical reactions. Learning of measurements and calculations of the basic kinetic and thermodynamic parameters using examples from real chemical experiments and the use of these data for determination of the mechanisms of the organic reactions.

#### **Brief outline of the course:**

The importance of kinetics and mechanisms of organic reactions. Rate constants and kinetic equations. Methods used at measuring of the reaction rates. Particular steps of determination of kinetic equations and rate constants. Main stages at solving of kinetic problems. Effects of reaction conditions on the reaction rate. Determination of the kinetic equation and rate constants. Reactions, kinetic equations, and rate constants of the first, pseudo-first, and second order. Reversible reactions. Parallel reactions. Consecutive reactions. Activation energy and entropy. Acido-basic catalysis. Isotopic effects. Influence of the medium on the chemical reactions. Linear free-energy relationships.

#### **Recommended literature:**

#### **Course language:**

Notes:

Advanced knowledge of the EXCEL use is necessary.

#### **Course assessment**

Total number of assessed students: 16

А	В	С	D	Е	FX
43.75	18.75	31.25	6.25	0.0	0.0

Provides: doc. RNDr. Ján Imrich, CSc.

**Date of last modification:** 03.05.2015

Approved: prof. RNDr. Jozef Gonda, DrSc.

University: P. J.	University: P. J. Šafárik University in Košice									
Faculty: Faculty	of Science									
Course ID: ÚCH OS/03	Course ID: ÚCHV/ Course name: Organic synthesis OS/03									
Course type, sco Course type: L Recommended Per week: 2 / 1 Course method	Course type, scope and the method: Course type: Lecture / Practice Recommended course-load (hours): Per week: 2 / 1 Per study period: 28 / 14 Course method: present									
Number of ECT	S credits: 5									
Recommended s	semester/trimes	ster of the course	2:							
Course level: II.										
Prerequisities:										
Conditions for c Midterm exam. Presentation of a Final written exa	course completi a multistep synth am.	on: nesis.								
<b>Learning outcom</b> The aim is to be compounds, their	mes: become familiar r combination a	with the most in application in	mportant methors the synthesis of	ods for the synth	esis of organic les.					
Brief outline of Retrosynthetic a backbone using o bonds. Synthesis and substitution molecules and n	<b>Brief outline of the course:</b> Retrosynthetic analysis of organic compounds and synthesis planning. Building of a carbon backbone using organometallic compounds and enolates. Reactions resulting in creation of multiple bonds. Synthesis of cyclic molecules. Functional group manipulation using oxidations, reductions and substitutions. Protecting groups and special synthetic techniques. Synthesis of complex molecules and natural products.									
<ul> <li>Recommended literature:</li> <li>Carruthers W., Coldham I.: Modern Methods of Organic Synthesis, Fourth Edition, Cambridge University Press, 2005</li> <li>3. Hanson, J. R.: Organic Synthetic Methods, The Royal Society of Chemistry 2002.</li> </ul>										
Course languag	e:									
Notes:										
Course assessme Total number of	Course assessment Total number of assessed students: 166									
A	В	С	D	E	FX					
53.01	30.12	11.45	3.01	2.41	0.0					
Provides: RNDr	. Martin Walko,	PhD.		•						
Date of last mod	lification: 07.02	2.2020								
Approved: prof.	RNDr. Jozef G	onda, DrSc.			Approved: prof. RNDr. Jozef Gonda, DrSc.					

Faculty: Faculty of Science

Course ID: ÚCHV/	<b>Course name:</b> Organometallic compounds
CHOZ/03	

#### Course type, scope and the method: Course type: Lecture / Practice Recommended course-load (hours):

Per week: 2 / 1 Per study period: 28 / 14

Course method: present

Number of ECTS credits: 4

#### **Recommended semester/trimester of the course:**

Course level: II.

Prerequisities:

#### Conditions for course completion:

Method of assessment and course studies completion: Examination

Continuous assessment (e.g. written test, individual work...): Individual work on seminars, 2 written tests (7th and 14th week)

Final assessment (e.g. exam, thesis...): Written exam consisting of theory and solving the practical synhetic problems

#### Learning outcomes:

Objectives of the course: To clarify the role of the organometallic compounds chemistry as one of the perspective interdisciplinary field of organic and inorganic chemistry.

#### Brief outline of the course:

Brief outline of the course: The goal of this subject is to apprise the students of the main characteristics of organometallic compounds - the types of carbon-metal bonds, the structure, chirality and basic methods of preparation of organometallic compounds. The most important groups of organometallic compounds, including metallocenes, are presented in details herein. Many examples of the utilization of organometallic complexes in addition, elimination and substitution reactions are given including many examples of their applications in asymmetric synthesis and in the synthesis of natural products possesing some biological activity.

#### **Recommended literature:**

C. Elshenbroich, A. Salzer, Organometallics, VCH Publisheres; 2nd ed 1993

F.A.Carey, R.J. Sundberg, Advanced organic chemistry, Kluwer

Academic Publishers Group, 4th ed 2001

R.H. Crabtree, The Organometallic chemistry of Transition Metals,

John Wiley & Sons, 3rd ed 2000

Š. Toma, R. Šebesta, J. Cvengroš, Chémia a využitie organokovových zlúčenín, OMEGA INFO, Bratislava, 2007

M. Schlosser, Organometallics in Synthesis, 3rd Manual, John Wiley & Sons, 2013

#### Course language:

slovak and english

#### Notes:

Course assessment Total number of assessed students: 82						
ABCDEFX						
56.1	19.51	10.98	7.32	6.1	0.0	
Provides: RNDr. Jana Špaková Raschmanová, PhD.						
Date of last modification: 03.05.2015						
Approved: prof. RNDr. Jozef Gonda, DrSc.						

University: P. J.	. Šafárik Univers	sity in Košice					
Faculty: Faculty	y of Science						
Course ID: Dek UPJŠ/PPZ/13	A. PF Course name: Personality Development and Key Competences for Success on a Labour Market						
Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: Per study period: 14s Course method: present							
Number of EC	<b>IS credits:</b> 2						
Recommended	semester/trime	ster of the cours	<b>e:</b> 1., 3.				
<b>Course level:</b> II							
Prerequisities:							
Conditions for	course complet	ion:					
Learning outco	mes:						
Brief outline of	the course:						
Recommended	literature:						
Course languag	ge:						
Notes:							
Course assessment Total number of assessed students: 39							
Α	В	C	D	Е	FX		
100.0	100.0 0.0 0.0 0.0 0.0						
Provides: RNDr. Peter Stefányi, PhD.							
Date of last modification: 03.05.2015							
Approved: prof. RNDr. Jozef Gonda, DrSc.							

University: P. J. Šafá	rik University in Koši	ce				
Faculty: Faculty of S	Faculty: Faculty of Science					
<b>Course ID:</b> ÚCHV/ FAK1a/07	Irse ID: ÚCHV/ Course name: Pharmacology I K1a/07					
Course type, scope a Course type: Lectur Recommended cour Per week: 2 / 2 Per Course method: pre	nd the method: re / Practice rse-load (hours): study period: 28 / 28 esent					
Number of ECTS cr	edits: 4					
Recommended seme	ster/trimester of the	course:				
Course level: II.						
Prerequisities: ÚCH	V/FMCH/04					
Conditions for cours	e completion:					
Learning outcomes:						
Brief outline of the c	ourse:					
Recommended litera	iture:					
Course language:						
Notes:						
Course assessment Total number of asses	ssed students: 12					
abs n						
100.0 0.0						
Provides: prof. MVDr. Ján Mojžiš, DrSc.						
Date of last modifica	Date of last modification: 03.05.2015					
Approved: prof. RNDr. Jozef Gonda, DrSc.						

University: P. J.	University: P. J. Šafárik University in Košice						
Faculty: Faculty	Faculty: Faculty of Science						
Course ID: ÚCI FAK1b/07	HV/ Course name: Pharmacology II						
Course type, scope and the method: Course type: Lecture / Practice Recommended course-load (hours): Per week: 2 / 2 Per study period: 28 / 28 Course method: present							
Number of EC	<b>FS credits:</b> 6						
Recommended	semester/trime	ster of the cours	e:				
Course level: II							
Prerequisities:	ÚCHV/FAK1a/0	)7					
Conditions for	course completi	ion:					
Learning outco	mes:						
Brief outline of	the course:						
Recommended	literature:						
Course languag	ge:						
Notes:							
Course assessment Total number of assessed students: 9							
A	В	С	D	Е	FX		
0.0	11.11 33.33 11.11 44.44 0.0						
Provides: prof. MVDr. Ján Mojžiš, DrSc.							
Date of last modification: 03.05.2015							
Approved: prof. RNDr. Jozef Gonda, DrSc.							

University: P. J.	University: P. J. Šafárik University in Košice							
Faculty: Faculty	Faculty: Faculty of Science							
Course ID: KPPaPZ/PPZMg	Course name: Psychology and Health Psychology (Master's Study)							
Course type, scope and the method: Course type: Lecture / Practice Recommended course-load (hours): Per week: 1 / 2 Per study period: 14 / 28 Course method: present								
Number of EC	IS credits: 4							
Recommended	semester/trimes	ster of the cours	e:					
<b>Course level:</b> II	•							
Prerequisities:								
Conditions for	course completi	on:						
Learning outco	mes:							
Brief outline of	the course:							
Recommended	literature:							
Course languag	ge:							
Notes:								
Course assessment Total number of assessed students: 226								
Α	В	С	D	Е	FX			
19.47	25.22	25.22 25.66 13.27 15.93 0.44						
Provides: PhDr. Anna Janovská, PhD., Mgr. Lucia Hricová, PhD.								
Date of last mo	Date of last modification: 07.03.2018							
Approved: prof. RNDr. Jozef Gonda, DrSc.								

	COURSE INFORMATION LETTER
University: P. J. Šafá	rik University in Košice
Faculty: Faculty of S	cience
Course ID: ÚCHV/ KOC1/01	Course name: Quantum Chemistry
Course type, scope a Course type: Lectur Recommended cour Per week: 3 / 1 Per Course method: pre	nd the method: re / Practice rse-load (hours): study period: 42 / 14 esent
Number of ECTS cr	edits: 5
Recommended seme	ster/trimester of the course:
Course level: II.	
Prerequisities:	
<b>Conditions for cours</b> Activity within practi resp. during the term The examination will into account.	e completion: ce will be evaluated. Two written tests will be realized in 7-th and 14-th week, of the course. I consist of written and verbal test. Continuous evaluation will be also taken
Learning outcomes: Students will intensit theory (MO) and self optimization, transition	fy their knowledge in the field of valence-bond based on molecular orbital f-reliant perform basic quantum chemical calculations (molecular geometry on states, vibrational analysis, etc.).
<b>Brief outline of the c</b> Development of v approximations in n the framework of m hypersurfaces of m equilibrium and rate of	ourse: valence-bond theory. Time-independent Schrodinger equation. Basic nolecular orbital valence-bond theory. Variant methods of calculation in olecular orbital valence-bond theory. Chemical reactivity. Potential energy olecules. Reaction coordinate. Calculation of the absolute and relative constants, resp. in gas phase. Solvatation energy calculation.
<b>Recommended litera</b> 1. Jensen F.: Introduc	ature: etion to Computational Chemistry, Wiley,2000.

2. Leach A. R.: Molecular Modelling, Addison Wesley Longman Ltd. 1998.

3. Náray-Szabó G., Surján P. R., Ángyán J. G.: Applied Quantum

Chemistry, Akadémia Kiadó, Budapest, 1987.

#### **Course language:**

slovak language and english language

#### Notes:

#### Course assessment

Total number of assessed students: 32

А	В	С	D	Е	FX
81.25	15.63	3.13	0.0	0.0	0.0

Provides: RNDr. Ladislav Janovec, PhD.

Date of last modification: 03.05.2015

Approved: prof. RNDr. Jozef Gonda, DrSc.

University: P. J. Šafá	University: P. J. Šafárik University in Košice						
Faculty: Faculty of S	Faculty: Faculty of Science						
Course ID: ÚTVŠ/ ÚTVŠ/CM/13	Irse ID: ÚTVŠ/       Course name: Seaside Aerobic Exercise         VŠ/CM/13       VŠ/CM/13						
Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: Per study period: 36s Course method: present							
Number of ECTS cr	redits: 2						
Recommended seme	ester/trimester of the cours	e:					
Course level: I., II.							
Prerequisities:							
<b>Conditions for cours</b> Conditions for cours Attendance	se completion: e completion:						
Learning outcomes: Learning outcomes: Students will be provided an overview of possibilities how to spend leisure time in seaside conditions actively and their skills in work and communication with clients will be improved. Students will acquire practical experience in organising the cultural and art-oriented events, with the aim to improve the stay and to create positive experiences for visitors.							
<ul> <li>Brief outline of the course:</li> <li>Brief outline of the course:</li> <li>1. Basics of seaside aerobics</li> <li>2. Morning exercises</li> <li>3. Pilates and its application in seaside conditions</li> <li>4. Exercises for the spine</li> <li>5. Yoga basics</li> <li>6. Sport as a part of leisure time</li> <li>7. Application of projects of productive spending of leisure time for different age and social groups (children, young people, elderly)</li> <li>8. Application of seaside cultural and art-oriented activities in leisure time</li> </ul>							
Recommended literature:							
Course language:							
Notes:							
<b>Course assessment</b> Total number of asse	essed students: 42						
	abs	n					
	11.9	88.1					

Provides: Mgr. Alena Buková, PhD., Mgr. Agata Horbacz, PhD.

**Date of last modification:** 15.03.2019

Approved: prof. RNDr. Jozef Gonda, DrSc.

University: P. J. Šafá	University: P. J. Šafárik University in Košice							
Faculty: Faculty of Science								
Course ID: ÚCHV/ SEP1/15	Course name: Semestral Project 1							
Course type, scope a Course type: Practic Recommended cour Per week: 6 Per stu Course method: pre	Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 6 Per study period: 84 Course method: present							
Number of ECTS cr	edits: 4							
Recommended seme	ster/trimester of the cours	e:						
Course level: II.								
Prerequisities:								
<b>Conditions for cours</b> Notification any thesi with master degree th	e completion: s adversed by Department of nesis.	Physical Chemistry. Semester experimental work						
Learning outcomes: Semester scientific th	iesis.							
Brief outline of the c Experimental work in and discussion about	ourse: research field for master deg	gree . Evaluation of results and verbal presentation						
Recommended litera Recent journal refere	nture:							
Course language:								
Notes:								
<b>Course assessment</b> Total number of asses	ssed students: 50							
	abs	n						
	98.0 2.0							
<b>Provides:</b> prof. RNDr. Andrej Oriňak, PhD., prof. RNDr. Renáta Oriňaková, DrSc., RNDr. Andrea Morovská Turoňová, PhD., doc. RNDr. Andrea Straková Fedorková, PhD., doc. RNDr. Miroslava Martinková, PhD., prof. RNDr. Jozef Gonda, DrSc., RNDr. Monika Tvrdoňová, PhD., RNDr. Patrik Olekšák, RNDr. Kvetoslava Stanková, PhD., RNDr. Ján Elečko, PhD., doc. RNDr. Ján Imrich, CSc., RNDr. Mariana Budovská, PhD., RNDr. Martin Walko, PhD., RNDr. Ladislav Janovec, Ph.D., RNDr. Slávka Hamuľaková, PhD.								
Date of last modifica	tion: 20.09.2017							
Approved: prof. RNDr. Jozef Gonda, DrSc.								

University: P. J. Šafá	rik University in Košice				
Faculty: Faculty of Science					
Course ID: ÚCHV/ Course name: Semestral Project 2 SEP2/15					
Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 6 Per study period: 84 Course method: present					
Number of ECTS cr	edits: 6				
Recommended seme	ster/trimester of the cours	e:			
Course level: II.					
Prerequisities:					
<b>Conditions for cours</b> Notification any thesi with master degree th	e completion: s adversed by Department of nesis.	Physical Chemistry. Semester experimental work			
Learning outcomes: Semester scientific thesis.					
<b>Brief outline of the course:</b> Experimental work in research field for master degree . Evaluation of results and verbal presentation and discussion about.					
Recommended literature:					
Course language:					
Notes:					
Course assessment Total number of asses	ssed students: 46				
	abs	n			
	100.0	0.0			
<b>Provides:</b> prof. RNDr. Andrej Oriňak, PhD., prof. RNDr. Renáta Oriňaková, DrSc., RNDr. Andrea Morovská Turoňová, PhD., doc. RNDr. Andrea Straková Fedorková, PhD., doc. RNDr. Miroslava Martinková, PhD., prof. RNDr. Jozef Gonda, DrSc., RNDr. Monika Tvrdoňová, PhD., RNDr. Kvetoslava Stanková, PhD., RNDr. Ján Elečko, PhD., RNDr. Mariana Budovská, PhD., RNDr. Martin Walko, PhD., RNDr. Slávka Hamuľaková, PhD., RNDr. Ladislav Janovec, Ph.D.					
Date of last modifica	tion: 20.09.2017				
Approved: prof. RNDr. Jozef Gonda, DrSc.					

University: P. J. Šafá	rik Univers	ity in Košice		
Faculty: Faculty of S	cience			
Course ID:Course name: Social-Psychological Training of Coping with Critical LifeKPPaPZ/SPVKE/07Situations				
Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 2 Per study period: 28 Course method: present				
Number of ECIS cr	edits: 2			
Recommended seme	ster/trimes	ster of the course: 2.		
Course level: II.				
Prerequisities:				
Conditions for cours	Conditions for course completion:			
Learning outcomes:	Learning outcomes:			
Brief outline of the c	ourse:			
Recommended literature:				
Course language:				
Notes:				
Course assessment Total number of assessed students: 126				
abs		n	Z	
97.62		2.38	0.0	
Provides: Mgr. Ondre	ej Kalina, P	hD.		
Date of last modifica	tion: 18.03	3.2019		
Approved: prof. RNI	Dr. Jozef G	onda, DrSc.		

University: P. J. Šafá	rik University in Košice				
Faculty: Faculty of S	Science				
Course ID: ÚTVŠ/ TVa/11Course name: Sports Activities I.					
Course type, scope a Course type: Practi Recommended cou Per week: 2 Per stu Course method: pr	and the method: ce rse-load (hours): ady period: 28 esent				
Number of ECTS cr	redits: 2				
Recommended seme	ester/trimester of the course: 1.				
Course level: I., I.II.	, II.				
Prerequisities:					
<b>Conditions for cours</b> Conditions for cours Min. 80% of active p	se completion: e completion: participation in classes.				
Learning outcomes: Learning outcomes: Increasing physical	condition and performance within individual sports. Strengthening the				

relationship of students to the selected sports activity and its continual improvement.

#### Brief outline of the course:

Brief outline of the course:

Within the optional subject, the Institute of Physical Education and Sports of Pavol Jozef Šafárik University provides for students the following sports activities: aerobics, basketball, badminton, floorball, yoga, pilates, swimming, body-building, indoor football, self-defence and karate, table tennis, sports for unfit persons, streetball, tennis, and volleyball.

In the first two semesters of the first level of education students will master basic characteristics and particularities of individual sports, motor skills, game activities, they will improve level of their physical condition, coordination abilities, physical performance, and motor performance fitness. Last but not least, the important role of sports activities is to eliminate swimming illiteracy and by means of a special program of medical physical education to influence and mitigate unfitness. In addition to these sports, the Institute offers for those who are interested winter and summer

physical education trainings with an attractive program and organises various competitions, either at the premises of the faculty or University or competitions with national or international participation.

#### **Recommended literature:**

#### **Course language:**

Notes:

Course assessment Total number of assessed students: 12947						
abs abs-A abs-B abs-C abs-D abs-E n neabs						neabs
88.64 0.06 0.0 0.0 0.0 0.03 7.22 4.05						4.05
<b>Provides:</b> doc. PhDr. Ivan Šulc, CSc., Mgr. Zuzana Küchelová, PhD., Mgr. Peter Bakalár, PhD., doc. PaedDr. Ivan Uher, PhD., Mgr. Agata Horbacz, PhD., Mgr. Marek Valanský, prof. RNDr. Stanislav Vokál, DrSc., Mgr. Dávid Kaško, Mgr. Aurel Zelko, PhD., Mgr. Dana Dračková, PhD., Mgr. Marcel Čurgali, PaedDr. Jana Potočníková, PhD.						
Date of last modification: 18.03.2019						
Approved: prof. RNDr. Jozef Gonda, DrSc.						

University: P. J. Šafá	rik University in Košice			
Faculty: Faculty of S	cience			
Course ID: ÚTVŠ/       Course name: Sports Activities II.         TVb/11				
Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 2 Per study period: 28 Course method: present				
Number of ECTS credits: 2				
Recommended semester/trimester of the course: 2.				
Course level: I., I.II., II.				

Prerequisities:

#### **Conditions for course completion:**

Conditions for course completion:

Final assessment and active participation in classes - min. 75%.

#### Learning outcomes:

Learning outcomes:

Increasing physical condition and performance within individual sports. Strengthening the relationship of students to the selected sports activity and its continual improvement.

#### Brief outline of the course:

Brief outline of the course:

Within the optional subject, the Institute of Physical Education and Sports of Pavol Jozef Šafárik University provides for students the following sports activities: aerobics, basketball, badminton, floorball, yoga, pilates, swimming, body-building, indoor football, self-defence and karate, table tennis, sports for unfit persons, streetball, tennis, and volleyball.

In the first two semesters of the first level of education students will master basic characteristics and particularities of individual sports, motor skills, game activities, they will improve level of their physical condition, coordination abilities, physical performance, and motor performance fitness. Last but not least, the important role of sports activities is to eliminate swimming illiteracy and by means of a special program of medical physical education to influence and mitigate unfitness.

In addition to these sports, the Institute offers for those who are interested winter and summer physical education trainings with an attractive program and organises various competitions, either at the premises of the faculty or University or competitions with national or international participation.

#### **Recommended literature:**

#### **Course language:**

Notes:

Course assessment Total number of assessed students: 11186						
absabs-Aabs-Babs-Cabs-Dabs-Enneabs						neabs
85.58 0.55 0.02 0.0 0.0 0.05 9.99 3.8						
<b>Provides:</b> doc. PhDr. Ivan Šulc, CSc., Mgr. Zuzana Küchelová, PhD., doc. PaedDr. Ivan Uher, PhD., Mgr. Peter Bakalár, PhD., Mgr. Agata Horbacz, PhD., Mgr. Marek Valanský, prof. RNDr. Stanislav Vokál, DrSc., Mgr. Dávid Kaško, Mgr. Aurel Zelko, PhD., Mgr. Dana Dračková, PhD., Mgr. Marcel Čurgali, PaedDr. Jana Potočníková, PhD.						
Date of last modification: 18.03.2019						
Approved: prof. RNDr. Jozef Gonda, DrSc.						

University:	P. J. Šafá	rik University i	n Košice				
Faculty: Fa	culty of S	cience					
<b>Course ID:</b> TVc/11	ourse ID: ÚTVŠ/ Course name: Sports Activities III. Vc/11						
Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 2 Per study period: 28 Course method: present Number of ECTS credits: 2							
Recommen	ded seme	ster/trimester	of the cours	e: 3.			
Course leve	el: I., I.II.,	II.					
Prerequisit	ies:						
Conditions	for cours	e completion:					
Learning o	Learning outcomes:						
Brief outlin	Brief outline of the course:						
Recommen	ded litera	ture:					
Course language:							
Notes:							
Course asso Total numb	essment er of asses	ssed students: 7	741				
abs	abs-A	abs-B	abs-C	abs-D	abs-E	n	neabs
90.03	0.04	0.01	0.0	0.0	0.03	4.04	5.85
<b>Provides:</b> doc. PhDr. Ivan Šulc, CSc., Mgr. Zuzana Küchelová, PhD., doc. PaedDr. Ivan Uher, PhD., Mgr. Peter Bakalár, PhD., Mgr. Agata Horbacz, PhD., Mgr. Marek Valanský, prof. RNDr. Stanislav Vokál, DrSc., Mgr. Dávid Kaško, Mgr. Aurel Zelko, PhD., Mgr. Dana Dračková, PhD., Mgr. Marcel Čurgali, PaedDr. Jana Potočníková, PhD.							
Date of last	modifica	tion: 03.05.201	15				
Approved:	prof. RNI	Dr. Jozef Gonda	, DrSc.				

University:	P. J. Šafá	rik University i	n Košice				
Faculty: Fa	culty of S	cience					
<b>Course ID:</b> TVd/11	ourse ID: ÚTVŠ/ Course name: Sports Activities IV. Vd/11						
Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 2 Per study period: 28 Course method: present Number of ECTS credits: 2							
Recommen	ded seme	ster/trimester	of the cours	e: 4.			
Course leve	el: I., I.II.,	II.					
Prerequisit	ies:						
Conditions	for cours	e completion:					
Learning of	utcomes:						
Brief outlin	e of the c	ourse:					
Recommen	ded litera	ture:					
Course lang	guage:						
Notes:							
Course asse Total numb	essment er of asses	ssed students: 5	086				
abs	abs-A	abs-B	abs-C	abs-D	abs-E	n	neabs
85.19	0.29	0.04	0.0	0.0	0.0	6.78	7.69
<b>Provides:</b> doc. PhDr. Ivan Šulc, CSc., Mgr. Zuzana Küchelová, PhD., Mgr. Peter Bakalár, PhD., doc. PaedDr. Ivan Uher, PhD., Mgr. Agata Horbacz, PhD., Mgr. Marek Valanský, prof. RNDr. Stanislav Vokál, DrSc., Mgr. Lucia Kršňáková, PhD., Mgr. Dávid Kaško, Mgr. Aurel Zelko, PhD., Mgr. Dana Dračková, PhD., Mgr. Marcel Čurgali, PaedDr. Jana Potočníková, PhD.							
Date of last	modifica	tion: 03.05.201	15				
Approved:	prof. RNI	Dr. Jozef Gonda	a, DrSc.				

University: F. J. Salarik University in Ku
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Faculty: Faculty of Science

**Course ID:** ÚCHV/ **Course name:** Structure and Reactivity in Organic Chemistry STRE/09

Course type, scope and the method: Course type: Lecture / Practice Recommended course-load (hours):

Per week: 2 / 1 Per study period: 28 / 14

Course method: present

Number of ECTS credits: 4

**Recommended semester/trimester of the course:** 

Course level: II.

Prerequisities:

#### **Conditions for course completion:**

Tests: in 6th week (50 points) and in 12th week (50 points). At least 50% of points required from both. Terminal examination by written form, 100 points (2 x 50 points).

#### Learning outcomes:

This module aims to give an understanding of the major principles involved in organic chemistry - covering the fundamentals of bonding, structure and stereochemistry, leading to a description of the types of reaction and reactivity of the various structural types.

#### Brief outline of the course:

1. Bonding: atomic structure - the chemical bond, the periodic table, valence electrons, Lewis structures, conventions for drawing structures, atomic orbital theory, molecular orbital theory; covalent bonding – bonding in hydrocarbons, bonding in compounds containing heteroatoms, bonding in common functional groups, electronic effects, steric effects.

2. Structure: configuration – geometrical isomerism, optical isomerism, representations of stereoisomers, molecules with one stereogenic centre, molecules with more than one stereogenic centre, asymmetric heteroatoms; conformations – representations of conformers.

3. Reactivity: thermodynamics – Gibbs energy, enthalpy, entropy, chemical equilibrium; kinetics – rates of reaction, activation energy; classes of reaction mechanism – polar, radical, pericyclic, ligand coupling mechanisms, selectivity of reactions, solvents in organic chemistry.

4. Intermediates: carbocations, carbanions, radicals, carbenes, benzynes, ketenes.

5. Acidity a basicity: Lowry-Bronsted acid-base theory, organic acidity, organic basicity.

6. Nucleophilic Substitution: the SN1 reaction, the SN2 reaction, factors affecting reactions.

7. Electrophilic addition reactions, the energy profile of the reaction, the addition of HX to alkenes, Markovnikov's rule, the stereochemistry of electrophilic addition reactions, addition X2 to alkenes, hydration, hydroxymerkuration, hydroboration, addition of carbenes, addition of polyenes, nucleophilic addition reactions, nucleophilic addition to carbonyl compounds, addition water, addition of alcohols, addition of carbanions, the addition of organometallic reagents, addition of amines, conjugated additions, radical addition reactions.

8. Elimination reaction, E1, E2, E1cB, dehydration, dehydrohalogenation, dehalogenation, dehydrogenation.

9. The electrophilic aromatic substitution, halogenation, nitration, sulfonation, Friedel-Crafts alkylation, acylation, towards the impact of multiple groups, nucleophilic aromatic substitution, addition-elimination mechanism, benzynic mechanism, radical substitution of aromatics.

10. Nucleophilic substitution of sp2 carbon, tetrahedral mechanism, addition-elimination mechanism, the elimination-addition mechanism, the types of nucleophilic acyl substitution, nucleophilic acyl substitution of carboxylic acids and their derivatives.

11. Radical reactions, radical substitution, the radical addition, homolytic cleavage of  $\sigma$ -bond photochemical cleavage of  $\pi$ -bonds, one electron oxidation or reduction, cykloaromatiztion.

12. Pericyclic reaction types of pericyclic reactions: electrocyclic reactions, cycloaddition, sigmatropic rearrangements, ene reactions, Woodward-Hoffman rules.

- 7. Addition reactions
- 8. Elimination reactions
- 9. Aromatic substitution
- 10. Addition-elimination reactions
- 11. Radical reactions
- 12. Pericyclic reactions

#### **Recommended literature:**

1. Structure and Reactivity in Organic Chemistry, Mark G. Moloney, ISBN: 978-1-4051-1451-6, 318 pages, 2008, Wiley-Blackwell

2. Organic Chemistry: Structure and Reactivity, Seyhan N. Ege, ISBN-10: 0395902231, 1148 pages, 1998, Houghton Mifflin College Div.

#### **Course language:**

Slovak language and english language.

#### Notes:

Course assessment					
Total number of assessed students: 73					
А	В	С	D	Е	FX
35.62	36.99	19.18	5.48	2.74	0.0
<b>Provides:</b> RND	r. Slávka Hamuľ	aková. PhD., RN	Dr. Mária Vilkov	vá. PhD.	

#### Date of last modification: 03.05.2015

Approved: prof. RNDr. Jozef Gonda, DrSc.

r					
University: P. J.	. Šafárik Univers	ity in Košice			
Faculty: Faculty	y of Science				
Course ID: ÚC SVK1/00	rse ID: ÚCHV/ Course name: Students Scientific Conference (Presentation) 1/00				
Course type, sc Course type: Recommended Per week: Per Course metho	ope and the met d course-load (h r study period: d: present	thod: ours):			
Number of EC	<b>FS credits:</b> 4				
Recommended	semester/trimes	ster of the cours	e:		
Course level: II	-				
Prerequisities:					
Conditions for	course completi	on:			
Learning outco	Learning outcomes:				
Brief outline of	the course:				
Recommended	Recommended literature:				
Course language:					
Notes:					
Course assessment Total number of assessed students: 238					
А	В	С	D	Е	FX
100.0	0.0	0.0	0.0	0.0	0.0
Provides:					
Date of last mo	dification: 03.05	5.2015			
Approved: prof	. RNDr. Jozef G	onda, DrSc.			

University: P. J. Šafá	rik University in Košice				
<b>Faculty:</b> Faculty of S	cience				
Course ID: ÚTVŠ/ Course name: Summer Course-Rafting of TISA River					
Course type, scope a Course type: Practic Recommended cour Per week: Per stud Course method: pre	nd the method: ce rse-load (hours): ly period: 36s esent				
Number of ECTS cr	edits: 2				
Recommended seme	ster/trimester of the course:				
Course level: I., II.					
Prerequisities:					
<b>Conditions for course</b> Conditions for course Attendance Final assessment: Ra	e completion: completion: ft control on the waterway (attended/not attended)				
Learning outcomes: Learning outcomes: Students have knowled	edge of rafts (canoe) and their control on waterway.				
<ul> <li>Brief outline of the c</li> <li>Brief outline of the c</li> <li>Brief outline of the c</li> <li>1. Assessment of diff</li> <li>2. Safety rules for raf</li> <li>3. Setting up a crew</li> <li>4. Practical skills trai</li> <li>5. Canoe lifting and c</li> <li>6. Putting the canoe i</li> <li>7. Getting in the canoe</li> <li>8. Exiting the canoe o</li> <li>9. Taking the canoe o</li> <li>10. Steering</li> <li>a) The pry stroke (on</li> <li>b) The draw stroke</li> <li>11. Capsizing</li> <li>12. Commands</li> </ul>	ourse: ourse: iculty of waterways ting ning using an empty canoe carrying n the water without a shore contact be out of the water fast waterways)				
Recommended litera	iture:				
Course language:					
Notes:					

Course assessment				
Total number of assessed students. 151				
abs	n			
45.03	54.97			
Provides: Mgr. Peter Bakalár, PhD.				
Date of last modification: 18.03.2019				
Approved: prof. RNDr. Jozef Gonda, DrSc.				

University: P. J.	. Šafáı	rik Univers	ity in Košice			
Faculty: Faculty of Science						
Course ID: ÚC SMCH/03	HV/	V/ Course name: Supramolecular chemistry				
Course type, sc Course type: I Recommended Per week: 2 / 1 Course metho	Course type, scope and the method: Course type: Lecture / Practice Recommended course-load (hours): Per week: 2 / 1 Per study period: 28 / 14 Course method: present					
Number of EC	ГS cro	edits: 4				
Recommended	seme	ster/trimes	ster of the cours	e:		
Course level: II	•					
Prerequisities:						
Conditions for course completion: Presentation of a chosen topic. Final written exam.						
Learning outco	mes:					
Brief outline of the course:						
Recommended literature: 1. Lecture handouts can be found at http://lms.upjs.sk/course/view.php?id=385 2. J.W.Steed and J.L.Atwood, Supramolecular chemistry, Wiley : Chichester, 2000. 3. F.Vogtle, Supramolecular chemistry: an introduction, Wiley : Chichester, 1991.						
Course language:						
Notes:						
Course assessment Total number of assessed students: 67						
А		В	С	D	Е	FX
62.69	62.69 22.39 11.94 1.49 1.49 0.0					
Provides: RNDr. Martin Walko, PhD.						
Date of last modification: 03.05.2015						
Approved: prof. RNDr. Jozef Gonda, DrSc.						

University: P. J. Šafán	rik University in Košice
Faculty: Faculty of S	cience
Course ID: ÚTVŠ/ KP/12	Course name: Survival Course
Course type, scope a Course type: Practic Recommended cour Per week: Per stud Course method: pre	nd the method: ce rse-load (hours): y period: 36s esent
Number of ECTS cro	edits: 2
Recommended seme	ster/trimester of the course:
Course level: I., II.	
Prerequisities:	
Conditions for course Conditions for course Attendance Final assessment: cor	e completion: completion: ntinuous fulfilment of all tasks within the course
Learning outcomes: Learning outcomes: Students will be fan conditions as they wi and demanding situa course develops team require overcoming o	niliarized with principles of safe stay and movement in extreme natural ll obtain theoretical knowledge and practical skills to solve the extraordinary tions connected with survival and minimization of damage to health. The n work and students will learn how to manage and face the situations that f obstacles.
<ul> <li>Brief outline of the c Brief outline of the cc Lectures:</li> <li>1. Principles of behave</li> <li>2. Preparation and leat</li> <li>3. Objective and subjing</li> <li>4. Principles of hygical Exercises:</li> <li>1. Movement in terration</li> <li>2. Preparation of imp</li> <li>3. Water treatment and</li> </ul>	ourse: burse: viour and safety for movement and stay in unknown mountains adership of tour ective danger in mountains ne and prevention of damage to health in extreme conditions in, orientation and navigation in terrain (compasses, GPS) rovised overnight stay d food preparation.
Recommended litera	ture:
Course language:	
Notes:	

Course assessment Total number of assessed students: 392				
abs n				
44.39	55.61			
Provides: Mgr. Marek Valanský, MUDr. Peter Dombrovský				
Date of last modification: 15.03.2019				
Approved: prof. RNDr. Jozef Gonda, DrSc.				

University: P. J. Šafárik University in Košice							
Faculty: Facult	y of Science						
Course ID: KPPaPZ/UPR/0	3 Course na	Course name: The Art of Aiding by Verbal Exchange					
Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 2 Per study period: 28 Course method: present							
Number of EC	TS credits: 2						
Recommended	semester/trimes	ster of the cours	<b>e:</b> 4.				
Course level: II	- -						
Prerequisities:							
<b>Conditions for</b>	course completi	on:					
Learning outco	omes:						
Brief outline of	the course:						
Recommended	literature:						
Course languag	ge:						
Notes:							
Course assessment Total number of assessed students: 49							
А	A B C D E FX						
85.71	85.71 4.08 2.04 2.04 2.04 4.08						
Provides: Mgr. Ondrej Kalina, PhD.							
Date of last modification: 18.03.2019							
Approved: prof. RNDr. Jozef Gonda, DrSc.							

Faculty: Faculty of Science

Course ID: ÚCHV/	<b>Course name:</b> Toxicology of organic compounds
TOXOL/03	

#### Course type, scope and the method: Course type: Lecture Recommended course-load (hours): Per week: 3 Per study period: 42 Course method: present

Number of ECTS credits: 4

**Recommended semester/trimester of the course:** 

Course level: II.

Prerequisities:

#### **Conditions for course completion:**

Seminar written report on the selected subjects of toxicology of organic compounds and its oral presentation connected with the discussion. Terminal examination by oral form.

#### Learning outcomes:

The study of the interaction between chemicals and biological systems in order to quantitively determine the potential for organic compounds to produce the harmful effects in living organisms.

#### **Brief outline of the course:**

General principles of toxicology, definition of xenobiotics, toxic effects, ocal and systemic toxicity. Toxicikinetic, absorption, distribution, biotransformation and excretion of xenobiotics and their metaboltes. Biotransformation of xenibiotics. Phase I Reactions (oxidation, reduction, hydrolysis), characterization of enzymes . Phase II reactions, glucuronidation, sulfatation, methylation, acetylation, amino acid conjugation, glutathione konjugation. Toxication versus detoxication, general principles, toxic intermediates and their detoxication. Biotransformation of organic solvents and their toxic effects, toxic efffects of natural products of microorganisms, fungi, plants and some animals. Drug dependence, the general principles and mechanisms.

#### **Recommended literature:**

C. D. Laassen: Toxicology: The basic science of poisons, McGraw-Hill Companies, Inc. 2001. ISBN: 0-07-134721-6.

Course language:					
Notes:					
Course assessn	nent				
Total number o	f assessed studer	nts: 137			
А	В	C	D	Е	FX
64.23 21.9 8.76 3.65 1.46 0.0					
Provides: doc.	RNDr. Miroslav	a Martinková, Ph	D.	·	

**Date of last modification:** 03.05.2015

Approved: prof. RNDr. Jozef Gonda, DrSc.

University: P. J. Šafárik University in Košice				
Faculty: Faculty of S	cience			
Course ID: ÚCHV/ USOL/09	IV/         Course name: Určovanie štruktúry organických zlúčenín			
Course type, scope a Course type: Lectur Recommended cour Per week: 0 / 2 Per Course method: pre	nd the method: re / Practice rse-load (hours): study period: 0 / 28 esent			
Number of ECTS cr	edits: 3			
Recommended seme	ster/trimester of the cours	e:		
Course level: II.				
Prerequisities:				
<b>Conditions for cours</b> Test: 7. and 14. week	e completion: - structure determination of	unknown compounds		
<b>Learning outcomes:</b> The main goal of the	subject is to have the ability	to solve the complex assignment NMR problems.		
<ul> <li>Brief outline of the course:</li> <li>1. 1H and 13C chemical shifts.</li> <li>2. Through bond effects: Spin-spin coupling - homonuclear experiments (1D and 2D COSY and TOCSY experiments).</li> <li>3. Through space effects: NOE (1D and 2D NOESY experiments).</li> <li>4. Heteronuclear correlation experiments - HSQC, HMBC, H2BC.</li> <li>5. Strategies for assigning resonances to atom within a molecule.</li> <li>6. Strategies for elucidating unknown molecular structures.</li> <li>7. FID processing - Mestrec</li> <li>8. Notation of spectral data for publication</li> </ul>				
Recommended literature:				
Course language:				
Notes:				
Course assessment Total number of assessed students: 91				
abs n				
100.0 0.0				
Provides: RNDr. Mária Vilková, PhD.				
Date of last modifica	Date of last modification: 03.05.2015			
Approved: prof. RNI	Dr. Jozef Gonda, DrSc.			

University: P. J. Šafá	University: P. J. Šafárik University in Košice				
Faculty: Faculty of Science					
Course ID: ÚTVŠ/ ZKLS//13	Course name: Winter Ski Training Course				
Course type, scope a Course type: Practic Recommended cour Per week: 36 Per st Course method: pre	Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 36 Per study period: 504 Course method: present				
Number of ECTS cr	edits: 2				
Recommended seme	ster/trimester of the	course:			
Course level: I., II.					
Prerequisities:					
Conditions for cours	e completion:				
Learning outcomes:					
Brief outline of the c	ourse:				
Recommended litera	iture:				
Course language:					
Notes:					
Course assessment Total number of assessed students: 97					
abs n					
32.99 67.01					
Provides: doc. PhDr. Ivan Šulc, CSc., Mgr. Marek Valanský					
Date of last modifica	Date of last modification: 03.05.2015				
Approved: prof. RNI	Approved: prof. RNDr. Jozef Gonda, DrSc.				