CONTENT

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ CPC/04	**Course name:** Chiral auxiliaries & ligands

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 ECTS credits: 8

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Student must active work during semester (seminar written discussion).
The terminal examination consists of written and oral part.
Terminal examination by written form and oral presentation of the resolved synthetic problems, followed by subsequent discussion with the examiner.
The witten part is evaluated as follows: 100-91% of points = A, 90-81% of points = B, 80- 71% of points = C, 70-61% = D, 60-51% of points = E, 50% and less = FX.
The final evaluation is based on combination of the obtained results from both parts.

Learning outcomes:
The general review on chiral auxiliaries and ligands and their application in asymmetric synthesis. After completing the subject, the doctoral student can combine the latest knowledge in the field of chiral auxiliary agents and ligands to solve a synthetic problem in order to obtain a solution with significant added value. He has knowledge of modern asymmetric synthesis and catalysis, which he can apply in solving given synthetic problems.

Brief outline of the course:
Enantiomerically pure chiral auxiliaries (alcohols, diols, diphenols, amines, diamines, hydrazines, amonoalcohols, amino acids, oxazolidinones, thiazolidinones, aldehydes, ketones, lactams,)
Chiral reagents (chiral proton donors, chiral bases, alumínium and boron hydrides). Chiral catalysis and catalysts bearing chiral ligands (aminoalcohols, amino acids, crown ethers, Lewis acids, transition metal catalysts). Asymmetric deprotonations and protonations. Alkylations and related reactions. Additions to C=O and C=N double bond (reductions by hydrides and boranes). Addtions to carbon-carbon double bonds (reductions by hydrides, hydroboration, dihydroxylation, epoxidation), Sigmatropic rearrangements (thermal and catalyzed).

Recommended literature:
1. J. Seyden-Penne: Chiral auxiliaries and ligands in asymmetric synthesis, John Wiley & Sons, 2005.
2. M. Christmann, S. Brase.: Asymmetric synthesis II: More methods and Applications, 2012 Wiley#VCH Verlag GmbH & Co. KGaA 2012, ISBN:9783527329212. Online ISBN:9783527652235.

Course language:
anglický

Notes:
Teaching is carried out in person or, if necessary, online, using the MS Teams tool. The form of teaching is specified by the teacher at the beginning of the semester, updated continuously.

Course assessment
Total number of assessed students: 35

N	P
0.0	100.0

Provides: prof. Mgr. Radovan Šebesta, DrSc., doc. RNDr. Miroslava Martinková, PhD.

Date of last modification: 04.08.2022

Approved: doc. RNDr. Miroslava Martinková, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ POCE/04	**Course name:** Current topics in organic chemistry

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 ECTS credits: 8

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
A student must actively work during semester (seminar written discussion).
The terminal examination consists of written and oral part.
Terminal examination by written form and oral presentation of the resolved synthetic problems, followed by subsequent discussion with the examiner.
The witten part is evaluated as follows: 100-91% of points = A, 90-81% of points = B, 80- 71% of points = C, 70-61% = D, 60-51% of points = E, 50% and less = FX.
The final evaluation is based on the combination of the obtained results from both parts.

Learning outcomes:
The modern view of the several important chapters of the advanced organic chemistry. New trends in the organic synthesis.

Brief outline of the course:
Delocalisation and conjugation, delocalized bonds, reaction intermediates, base and acid, effect on equilibria. Electrophilic and nucleophilic aromatic substitution, addition to C=C and C=Heteroatom bonds, elimination reaction, rearrangements, oxidations and reductions. Nucleophillic substitution at saturated carbon (compounds bearing the carbon-heteroatom bond).
Formations and reactions of enols and enolates. Reactivity of enolates, alkylation of enolates conjugate addition of enolates. Acylation of carbon. Nucleophilic substitution at C=O with loss of carbonyl oxygen. Using organometallic reagents to make C-C bonds. Pericyclic reactions. Cycloaditions and their stereochemical course. Diels-Alder reactions with the normal and reverse electron demands. Sigmatropic rearrangements and their selectivity. Aza-Claisn rearrangemets and their application in the costruction of the more complex products. Chemistry of the coupling reactions and their application in organic synthesis. Protective groups in organic synthesis.

Recommended literature:
1. Michael B. Smith, Jerry March: March's Advanced Organic Chemistry: Reactions, Mechanisms, and Structure, 7th Edition, 2013.
2. J. Clayden, N. Greeves, S. Warren, P. Wothers Organic Chemistry, Oxford University Press, NY 2012.

Course language:

anglický

Notes:
Teaching is carried out in person or, if necessary, online, using the MS Teams tool. The form of teaching is specified by the teacher at the beginning of the semester, updated continuously.

Course assessment
Total number of assessed students: 39

N	P
0.0	100.0

Provides: doc. RNDr. Miroslava Martinková, PhD., prof. Ing. Tibor Gracza, DrSc.

Date of last modification: 20.11.2021

Approved: doc. RNDr. Miroslava Martinková, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ ODZP/2014/15	**Course name:** Defence of Doctoral Thesis

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

Number of ECTS credits: 30

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
The Dissertation thesis is the result of the student's own scientific research. It must not show elements of academic fraud and must meet the criteria of correct research practice defined in the Rector's Decision no. 21/2021, which lays down the rules for assessing plagiarism at Pavel Jozef Šafárik University in Košice and its constituents. Fulfillment of the criteria is verified mainly in the process of supervising and in the process of the thesis defense. Failure to do so is grounds for disciplinary action.

Learning outcomes:
The Dissertation thesis has elements of a scientific work and the student demonstrates extensive mastery of the theory and professional terminology of the field of study, acquisition of knowledge, skills and competences in accordance with the declared profile of the graduate of the field of study, as well as the ability to apply them in an original way in solving selected problems of the field of study. The student demonstrates the ability of independent scientific work in terms of content, formal and ethical aspects. Further details of the Dissertation thesis are determined by Directive no. 1/2011 on the essential prerequisites of final theses and by the Study Rules of Procedure at UPJŠ in Košice for doctoral studies.
The doctoral student demonstrated the ability and readiness for independent scientific and creative activity in the field of study of philology in accordance with the expectations of the relevant qualification framework and the profile of the graduate.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 64

N	P
0.0	100.0

Provides:
Date of last modification: 08.11.2022
Approved: doc. RNDr. Miroslava Martinková, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ DZS/15	**Course name:** Dissertation examination
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS credits: 20	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 63

N	P
0.0	100.0

Provides:
Date of last modification: 15.09.2021
Approved: doc. RNDr. Miroslava Martinková, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ NSVR/04	**Course name:** High-resolution NMR spectroscopy

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 ECTS credits: 8

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
1. Attendance at lectures and seminars (also online form of teaching): the student's absence from two lectures / seminars will be justified by the teacher; after a long-term absence, an understanding of the curriculum demonstrated in an alternative form (eg elaboration of assignments, preparation of a lecture, ...)
2. Activity at seminars (also on-line form of teaching) - necessary theoretical preparation
3. Written assignments (20% of the total evaluation) - elaboration according to the teacher's instructions.
4. Final test (30% of the total evaluation).
5. Examination (written 25% and oral part 25%).

Learning outcomes:
The aim of the course is to get acquainted with 1D and 2D NMR methods and the application of the acquired knowledge in solving NMR problems.

Brief outline of the course:
1. Advanced 1D NMR methods
a) 13C NMR experiments - APT, DEPT
b) NOE experiments
c) Selective experiments
2. 2D NMR methods
a) Proton-proton correlated experiments (interactions through bonds) - COSY, TOCSY
b) Proton-proton correlated experiments (interactions across space) - NOESY
c) Proton-carbon correlated experiments - HSQC/HMQC/HETCOR, HMBC, H2BC, EXSIDE
d) Carbon-carbon correlated experiments - INADEQUATE

Recommended literature:
1. H. Friebolin: Basic One- and Two-Dimensional NMR Spectrocopy, 5. Ed., Wiley, 2010.
2. T. D. W. Claridge: High-Resolution NMR Techniques in Organic Chemistry, 5. Ed., Elsevier, 2016.
3. Atta-ur-Rahman, M. I. Choudhary: Solving Problems with NMR spectroscopy, Academic Press 1996.

Course language:
English

Notes:
Teaching is carried out in person or, if necessary, online, using the MS Teams tool. The form of teaching is specified by the teacher at the beginning of the semester, updated continuously.

Course assessment
Total number of assessed students: 24

N	P
0.0	100.0

Provides: doc. RNDr. Ján Imrich, CSc.

Date of last modification: 28.01.2022

Approved: doc. RNDr. Miroslava Martinková, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ MOZ/04	**Course name:** Molecular devices

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 ECTS credits: 8

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Student must actively work during semester. The seminar written report on the selected topic of this subject and its oral presentation connected with the common discussion with the examiner.
The terminal examination consists of written and oral part.
Terminal examination by written form and oral presentation of the resolved problems, followed by subsequent discussion with the examiner.
The witten part is evaluated as follows: 100-91% of points = A, 90-81% of points = B, 80- 71% of points = C, 70-61% = D, 60-51% of points = E, 50% and less = FX.
The final evaluation is based on combination of the obtained results from both parts.

Learning outcomes:
The general review on the principles of the molecular recognition, transformation and translation as the basic functions of the supramolecular structures as the components of the molecular machines. Series of the invited lectures of scientists working on the supramolecular chemistry.

Brief outline of the course:
EN
Receptors, molecular recognition, coordination. The genesis of interactions in supramolecular chemistry. Supramolecular chemistry in the nature. Porfyrins. DNA. Crown ethers, cryptands, cyclophanes. Selectivity and complementarity. Interactions with solvents. Macrocyclic and template effect. Receptors for the neutral molecules. Clathrates and intercalators. Cyclodextrins, calixarens. Fullerenes. Modification of fullerenes. Nanotubes. Supramolecular catalysis and transport. Proximity effect. Active and passive transport. Transporters. Molecular pumps. Bio-inspired supramolecular catalysis. Devices and machines at the molecular level, the concept of molecular machines. Fundamental principles of electron and energy transfer. Micelles and bilayers, Dendrimers.

Recommended literature:
1. J. W. Steed, J. L. Atwood: Supramolecular chemistry, Wiley and Sons Ltd, Chichester, 2000, ISBN ISBN 0-471-98791-3.
2. J. M.Lehn: Supramolecular chemistry: concepts and perspectives, Wiley VCH, Weinheim, 1995.
3. J. W. Steed: Supramolecular chemistry, John Wiley and Sons. Ltd. 2009.

4. V. Balzani, A. Credi, M Venturi: Molecular devices and Machines - a journey into the nano world, Wiley-VCH, Verlag GmbH and Co. KGaA, Weinheim 2003, ISBN 3-527-30506-8.

Course language:
anglický

Notes:
Teaching is carried out in person or, if necessary, online, using the MS Teams tool. The form of teaching is specified by the teacher at the beginning of the semester, updated continuously.

Course assessment
Total number of assessed students: 1

N	P
0.0	100.0

Provides: RNDr. Martin Walko, PhD.

Date of last modification: 20.11.2021

Approved: doc. RNDr. Miroslava Martinková, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ HZD/04	**Course name:** Nitrogen heterocycles

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 ECTS credits: 8

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Students must actively work during the course in a close collaboration with a teacher.
Student may only miss 1 practice.
Written exam - 100 pts. A minimum of 51 points must be obtained.
Assessment A: 91-100; B: 81-90; C: 71-80; D: 60-71; E: 51-60; FX: 0-50 pts.

Learning outcomes:
The aim of the course is to obtain the knowlegde about nitrogen heterocycles, their synthesis, reactivity as well as relationship between structure and biological properties.

Brief outline of the course:
Signification, synthesis and chemical properties of different types of nitrogen heterocyclic systems. Natural substances containing nitrogen heterocycles, biological activity and drugs based on nitrogen heterocycles and their synthesis.
Attention will be paid to aromatic and non-aromatic compounds, including their biological properties and application in organic synthesis.
A. Aromatic heterocycles
1. Six-membered heterocycles with one heteroatom (pyridine, acridine, quinoline, isoquinoline)
2. Five-membered heterocycles with one heteroatom (pyrrole, indole)
3. Six-membered heterocycles with two or more heteroatoms (pyrimidine, pyridazine, pyrazine, purine, pteridine)
4. Five-membered heterocycles with two heteroatoms (oxazole, isoxazole, thiazole, isothiazole, imidazole, pyrazole)
B. Non-aromatic heterocycles (morpholine, piperidine, piperazine)

Recommended literature:
1. Comprehensive Heterocyclic Chemistry; Katritzky A. R., Rees C. W., Eds., Pergamon Press, Oxford, 1984.
2. Gilchrist T. L.: Heterocyclic Chemistry, Longman, Harlow, 1992.
3. Eichler T., Hauptmann S.: The Chemistry of Heterocycles, Wiley-VCH, Weinheim 2003.

Course language:
Slovak and English

Notes:	
Course assessment Total number of assessed students: 18	
N	P
0.0	100.0
Provides: RNDr. Mariana Budovská, PhD.	
Date of last modification: 17.11.2021	
Approved: doc. RNDr. Miroslava Martinková, PhD.	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: KPE/ PgVU/17	**Course name:** Pedagogy for University Teachers

Course type, scope and the method:
Course type: Lecture
Recommended course-load (hours):
Per week: Per study period: 28s
Course method: present

Number of ECTS credits: 5

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
1. Development of a teaching diary—100%
2. Compulsory active participation and attendance in accordance with the Study Regulations.

Learning outcomes:
Students will be able to:
Apply didactic principles, methods, forms, and tools in the teaching of a specialised subject. Specify the educational procedures of a university teacher in subject teaching, pedagogical diagnostics, evaluation of learning outcomes, and self-reflection. Present rationalisation and streamlining possibilities in the teaching of specialised subjects. Apply educational competencies of university teachers taking into account the peculiarities of educating university students.

Brief outline of the course:
The personality of a university teacher. Teaching styles. Student in university education. Student learning styles. Possibilities of adapting teaching styles and student learning styles. University teacher–student interaction and communication in the teaching process. Pedagogical competencies of a university teacher. Didactic analysis of the curriculum; teaching materials and textbooks. Forms of university teaching. Methods of university teaching. Verification methods and student assessment. Creation of a didactic test. Designing university teaching process. University teacher self-reflection.

Recommended literature:
Čapek, R. (2015). Moderní didaktika. Lexikon výukových a hodnoticích metod. Praha, Grada Publishing, a.s.
Danek, J. (2014). Pedagogická komunikácia na vysokej škole. Trnava, Univerzita sv.Cyrila a Metoda v Trnave.
Dargová, J. (2001). Tvorivé kompetencie učiteľa. Prešov, Privat Press.
Dvořáček, J. (2014). Základy pedagogiky. Praha, Oeconomica.
Hupková, M., Petlák, E. (2004). Sebareflexia a kompetencie v práci učiteľa. Bratislava, IRIS.
Kyriacou, CH. (1996). Klíčové dovednosti učitele. Praha, Portál.
Mertin, V. a kol. (2012). Metody a postupy poznávaní žáka: pedagogická diagnostika. Praha, Wolters Kluwer.
Petty,G. (2013). Moderní vyučování. Praha, Portál.

Prucha, J. (2013). Moderní pedagogika. Praha, Portál.
Sirotová, M. (2014). Vysokoškolský učiteľ v edukačnom procese. Trnava, Univerzita sv.Cyrila a Metoda v Trnave.
Slávik, M. a kol. (2012). Vysokoškolská pedagogika. Praha, Grada.
Šebeň Zaťková, T. (2014). Úvod do vysokoškolskej pedagogiky. Trnava, Univerzita sv.Cyrila a Metoda v Trnave.
Turek, I. (2014). Didaktika. Bratislava, Wolters Kluwer, s.r.o.
Zormanová, L. (2014). Obecná didaktika. Praha, Grada.

Course language:
slovak

Notes:

Course assessment
Total number of assessed students: 78

abs	n	neabs
98.72	0.0	1.28

Provides: doc. PaedDr. Renáta Orosová, PhD.

Date of last modification: 07.09.2022

Approved: doc. RNDr. Miroslava Martinková, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ PAKM/04	**Course name:** Practical application of quantum chemical methods in organic chemistry

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 ECTS credits: 8

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
The examination can consist of written and/or oral examination as the examiner may determine. In order to pass this course, each student must complete ALL of the following compulsory requirements: Students may only miss 1 practise session. Students must actively work during a practise part of the course in a close collaboration with a teacher. Students must obtain at least 51 percent of the total number of points of the written examination. The final evaluation is assigned on the basis of the mark of the written examination. Students are assigned a grade in the course as follows: 100 - 91% (A), 90 - 81% (B), 80 - 71% (C), 70 - 61% (D), 60 - 51% (E), 50% and less FX.

Learning outcomes:
To provide students with a basic orientation in current quantum chemical methods used in the study of small and medium-sized organic molecules. The acquired knowledge will enable students to understand the scope and limitations of various theoretical models in solving chemical problems and assess their degree of reliability and suitability for various types of calculations. The skills acquired in the exercise will allow them to performe the basic types of calculations using available software tools (Mopac, Molden, Gamess, Gaussian, ...) and analyze the obtained results.

Brief outline of the course:
1. Overview of current quantum mechanical models in chemistry.
(semiempirical, ab-initio, post-HF, DFT)
2. Conformational analysis and structure optimization of small and medium molecules. (minimization algorithms, description of PES)
3. Basic procedures for investigating the reaction pathways of chem. reactions.
(localization of PES saddle point structures, TS optimization, IRC, calculation of thermodynamic parameters)
4. Qualitative theories and their practical application.
(frontier orbital theory, BEP principle - Hammond's postulate)
5. Calculations of molecular properties.
(vibrational, electronic and NMR spectra, optical properties, electrostatic potential, ...)
6. Solvation models.
(SCRF, PCM, COSMO)

Recommended literature:

1. Foresman, J. B., Frisch, A.: Exploring Chemistry with electronic structure method. Gaussian Inc., 1996.
2. Jensen, F.: Introduction to computational chemistry, J. Willey&Sons, 1998.
3. Leach, A.R.: Molecular modelling. Principles and applications. Longman, 1996.

Course language:
slovak, english

Notes:
Teaching is carried out in person or, if necessary, online using the MS Teams platform. The form of teaching is specified by the teacher at the beginning of the semester, updated continuously.

Course assessment
Total number of assessed students: 5

N	P
0.0	100.0

Provides: doc. RNDr. Ladislav Janovec, PhD.

Date of last modification: 10.01.2022

Approved: doc. RNDr. Miroslava Martinková, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: KPPaPZ/PsVU/17	**Course name:** Psychology for University Lecturers

Course type, scope and the method:
Course type: Lecture
Recommended course-load (hours):
Per week: Per study period: 28s
Course method: present

Number of ECTS credits: 5

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Case study, micro-output, its analysis
Current modifications of the course are listed in the electronic bulletin board of the course.

Learning outcomes:
After completing the course, students can:
and Understand, summarize and explain selected psychological knowledge from cognitive psychology, emotion and motivation psychology, personality psychology, developmental, social, educational psychology and health psychology.
b) apply the above psychological knowledge necessary for the professional, competent performance of university teaching practice of doctoral students
c) to create and implement the teaching of a professional topic with applied psychological knowledge
d) evaluate their performance and the performance of their classmates, provide feedback

Brief outline of the course:
The content of the course is based on selected psychological knowledge of cognitive psychology, psychology of emotions and motivation, personality psychology, developmental, social, educational psychology and health psychology. Teaching is realized by a combination of lectures with interactive, experiential methods, discussion, open communication with mutual respect, support of independence, activity and motivation of students. Syllabus: University teacher and his work in the teaching process with a focus on: teachers in relation to themselves (cognitive, personal, social and competencies in the use of methods), in relation to students and as part of the teacher-student relationship on the basis of selected areas of cognitive psychology, psychology of emotions and motivation, developmental psychology, social psychology, educational psychology and health psychology with application to the university environment

Recommended literature:
Alexitch, L. R. (2005). Applying social psychology to education. Social Psychology.–Ed.: Schneider F., Gruman J., Coutts L.–Sage Publications, Inc, 205-228.
Fry, H., Ketteridge, S., & Marshall, S. (2008). A handbook for teaching and learning in higher education: Enhancing academic practice. Routledge.
Mareš, J.: Pedagogická psychologie. Portál, 2013.

Kniha psychologie. Universum, 2014
Čáp, J., Mareš, J.: Psychologie pro učitele. Praha: Portál 2007.
Vágnerová, M.: Školní poradenská psychológie pro pedagogy. Praha: Karolínum 2005.

Course language:
slovak

Notes:

Course assessment
Total number of assessed students: 70

abs	n	neabs
100.0	0.0	0.0

Provides: PhDr. Anna Janovská, PhD.

Date of last modification: 24.06.2022

Approved: doc. RNDr. Miroslava Martinková, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ CHSA/04	**Course name:** Saccharides

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 ECTS credits: 8

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Student must actively work during semester (seminar written discussion). The preparation of the material on the application of carbohydrates as the useful chirons in the stereoselective synthesis of the various natural products and its oral presentation.
The terminal examination consists of written and oral part.
Terminal examination by written form and oral presentation of the resolved synthetic problems, followed by subsequent discussion with the examiner.
The witten part is evaluated as follows: 100-91% of points = A, 90-81% of points = B, 80- 71% of points = C, 70-61% = D, 60-51% of points = E, 50% and less = FX.
The final evaluation is based on combination of the obtained results from both parts.

Learning outcomes:
The general review on carbohydrate chemistry and applications of the simple saccharide molecules as chirons (chiral-pool strategy) in modern stereoselective syntheses of various natural products and their analogues involving multiple stereogenic centers.

Brief outline of the course:
General introduction, nomenclature of monosaccharides, configuration and stereochemistry of monosaccharides (the Fischer projection, the Haworth projection, conformation of sugars). Reactions of monosaccharides (reactions of carbonyl groups and hydroxyl groups, protective group strategies, production of ethers, esters, acetals, ketals. Monosaccharide derivatives, their nomenclature and preparation. Ascending and descending reactions of monosaccharides. Functionalization of saccharides. Nucleophilic substitutions, oxidations, reaction of the anomeric carbon. Glycosylation methods. Synthesis of C-, N- and O-glycosides. Oligosaccharide synthesis. Application of monosaccharides and their derivatives as the chiral templates in the stereoselective organic synthesis.

Recommended literature:
Levy, D. E., Fügedi, P.: The organic chemistry of sugars. Taylor & Francis Group, LLC 2006, ISBN: 0-8247-5355-0.
2. El Khadem, H. S.: Carbohydrate Chemistry: Monosaccharides and Their Oligomers. Academic Press 1988, INC. (London) Ltd., ISBN: 0-12-236870-3.

3. Miljković, M.: Carbohydrates. Synthesis, mechanisms and stereoelectronic effects. Springer Science and Business Media, LLC, New York, 2009. ISBN: 978-0-387-92265-2.
4. Sinnott, M. L.: Carbohydrate Chemistry and Biochemistry. RSC Publishing 2007, UK, .ISBN 978-0-85404-256-2.

Course language:
anglický

Notes:
Teaching is carried out in person or, if necessary, online, using the MS Teams tool. The form of teaching is specified by the teacher at the beginning of the semester, updated continuously.

Course assessment
Total number of assessed students: 26

N	P
0.0	100.0

Provides: doc. RNDr. Miroslava Martinková, PhD.

Date of last modification: 20.11.2021

Approved: doc. RNDr. Miroslava Martinková, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/ PDS/18	**Course name:** Writing Dissertation Work
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS credits: 0	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 6	

N	P
0.0	100.0

Provides:
Date of last modification: 15.09.2021
Approved: doc. RNDr. Miroslava Martinková, PhD.