

Course descriptions

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COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/419-PhD-A/15	Course title: Active participation at the domestic scientific event 4)
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: distance learning	
Number of credits: 4	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 3	
ABS	NEABS
100,0	0,0
Lecturers:	
Last change:	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/418-PhD-A/15	Course title: Active participation at the international scientific events 4)
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: distance learning	
Number of credits: 7	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 1	
ABS	NEABS
100,0	0,0
Lecturers:	
Last change:	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/425-PhD-A/15	Course title: Activities other (eg. A member of the organizing committee of the conference)
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: distance learning	
Number of credits: 3	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 1	
ABS	NEABS
100,0	0,0
Lecturers:	
Last change:	
Approved by:	

STATE EXAM DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/504-PhD-A/15	Course title: Analytical Chemistry
Number of credits: 0	
Educational level: III.	
Course requirements: Successful completion of the exam.	
Learning outcomes: After completing the course, the doctoral student will gain advanced theoretical knowledge in the use of modern instrumental analytical methods chromatographic, electromigration, electrochemical, spectral (MS, NMR, IR, UV-VIS, Fluorescent) and nuclear analytical as well as multidimensional techniques (SPE-HPLC, HPLC- HPLC, CE-CE, MS / MS and combinations thereof) in pharmaceutical and biomedical analysis. An integral part of the acquired knowledge are methods of preparation of pharmaceutical and biological samples as well as environmental samples by conventional (off-line) and advanced (on-line) techniques for the mentioned analytical methods. In connection with the synthesis and structural analysis of (i) new molecules as potential drugs or drug carriers for innovative dosage forms as well as (ii) innovative materials (nanostructures) as part of analytical systems and dosage forms, the doctoral student will gain knowledge and skills also for other specific approaches and techniques such as Raman spectroscopy on-line coupled with microwave synthesis, semi-preparative chromatography, electron microscopy, and light scattering-based structural analysis techniques.	
Class syllabus: Course contents: Analysis of organic bioactive substances, levels of drugs and their metabolites, degradation products and biomarkers of diseases in biological materials (blood, urine, tissues, etc.). Analysis of new organic molecules (potential drugs and drug carriers for innovative dosage forms) in reaction mixtures from organic syntheses and isolated products. Inorganic analysis of biogenic and toxic elements in individual components of the environment (air, soil, herbal drugs, water). Bioinorganic analysis of new metal complexes in reaction mixtures from organic syntheses and isolated products. Use of modern instrumental techniques: • chromatographic (HPLC, GC) and electromigration separation methods (CZE, ITP, IEF, EKC) and their mutual combinations (2D HPLC, 2D / 3D CE) with integrated sample pretreatment for separation of complex (multicomponent) mixtures of substances • spectral methods UV-VIS, FS and LIF (for rapid quantitative evaluation of substances in simple matrices), MS, MS / MS, NMR, IR, Raman spectroscopy, EPR, XRC / XRD (for detailed structural analysis molecules and their complexes) • combined separation and spectral methods (LC-UV / MS, CE-UV / LIF / MS, etc.) to identify and determine trace levels of analytes in simple and complex (multicomponent) matrices (biological samples, dosage forms, synthetic reaction mixtures, isolated products from reaction mixtures)	

- electrochemical methods with conventional and advanced sensors (biosensors) for rapid determination of selected substances in simple and complex matrices
- radioanalytical methods: radionuclide X-ray fluorescence analysis (RRFA) for direct determination of elements in solid materials
- methods of analysis of light scattering and electron microscopy for the analysis of nanostructures (shape, size/dimensions, distribution of nanoparticles)
- methods of (semi) preparative chromatography for separation and isolation of selected components from reaction mixtures

Instrumental analytical methods:

Principle of the method, experimental setup (instrumentation), methods of qualitative and quantitative evaluation, analytical and application potential. Optimization, validation and application of methods.

Electrochemical methods:

Potentiometry

Voltammetry (DPV, SWV, CV)

Ion selective electrodes

Biosensors

FIA

Separation chromatographic analytical methods:

Planar and column chromatography

High performance liquid chromatography.

Ion exchange chromatography.

Gas chromatography.

Multidimensional techniques (2D HPLC, SPE-HPLC)

Combining HPLC with advanced detection techniques (HPLC-MS, HPLC-MS / MS)

Separation analytical methods of electromigration:

Electrophoresis in planar arrangement, electromigration techniques in capillary arrangement.

Capillary zone electrophoresis (CZE).

Capillary isotachopheresis (ITP).

Isoelectric focusing (IEF).

Electrokinetic chromatography (EKC).

Capillary gel electrophoresis (CGE).

Capillary electrochromatography (CEC).

Multidimensional techniques (2D CE, 3D CE)

CE coupling with advanced detection techniques (CE-LIF, CE-MS, CE-MS / MS).

Separation preparative chromatographic and electromigration methods:

(semi) preparative liquid chromatography.

Preparative isotachopheresis.

Spectral analytical methods:

Emission spectral analysis

Fluorescence analysis

Atomic absorption spectrophotometry

Molecular absorption spectroscopy in the visible and ultraviolet region of the spectrum

Infrared spectroscopy

Raman spectroscopy.

Mass spectrometry.

Nuclear magnetic resonance.

Non-spectral optical methods:

Refractometry.

Polarimetry. X-ray crystallographic and diffraction analysis (XRC, XRD). Electron paramagnetic resonance (EPR). Detectors: Optical spectrometric detectors - absorption, fluorescence, MS, non-spectrometric Electrochemical detectors, Radiometric detectors Nuclear analytical methods: Nuclear analytical indicator methods - radiochromatography, isotope dilution analysis, radioimmunoassay and their use. Nuclear analytical methods based on natural radioactivity. Activation analysis. Nuclear analytical methods - non-activation interaction analysis. Beta-dispersion analysis. Radionuclide X-ray fluorescence analysis. Identification of β and γ radiation. Other analytical methods: Methods based on light scattering analysis. Electron microscopy. Statistical processing of analytical results and validation of analytical methods and procedures: Validation parameters (precision, accuracy, linearity, sensitivity, LOD, LLOQ, LOQ, selectivity, robustness, stability, recovery, matrix effect, sample throughput, carry over). Testing statistical hypotheses. Validation protocols (ICH, FDA).
State exam syllabus:
Recommended literature: Mikuš, P., Maráková, K.: HYPHENATED ELECTROPHORETIC TECHNIQUES IN ADVANCED ANALYSIS, Bratislava, KARTPRINT, 2012. 217 s. Mikuš, P., Hanko, M., Piešťanský, J., Maráková, K., Dokupilová, S., Mikulová, M.: Analytical chemistry: Instrumental analysis. Bratislava : VEDA, in preparation. Mikuš, P., Mikušová, V.: Analytical chemistry: Chemical analysis. Bratislava : VEDA, 2022. Selected chapters will be provided in electronic form.
Languages necessary to complete the course: English language
Notes: Teacher: prof. RNDr. Peter Mikuš, PhD., prof. RNDr. Emil Havránek, CSc., PharmDr. Katarína Maráková, PhD., PharmDr. Juraj Piešťanský, PhD.
Last change: 03.04.2022
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/404-PhD-A/15	Course title: Authorship of teaching aids and texts
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: distance learning	
Number of credits: 20	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 0	
ABS	NEABS
0,0	0,0
Lecturers:	
Last change:	
Approved by:	

STATE EXAM DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/506-PhD-A/15	Course title: Biochemistry
Number of credits: 0	
Educational level: III.	
Course requirements: Successful completion of the exam.	
Learning outcomes: After completing selected chapters in biochemistry, the PhD.-student can manage (i) basic biochemical and molecular-biological analyzes, (ii) methodical procedures related to protein analysis techniques, and (iii) enzymological studies on cellular and molecular levels. The student will obtain knowledge about metabolic pathways and their regulation at the level of (i) signaling molecules, (ii) localization at a subcellular level, and (iii) monitoring of gene expression, which creates the precondition for studying the drug mechanism of individual pharmacotherapeutic groups.	
Class syllabus: # Dynamic concept of properties and functions of the biological system. # DNA, RNA: composition, bonds and stability, biological significance. # Biomembranes, respiratory chain, generation of energy. # Metabolism of nutrients – interrelationship, thermodynamic aspect, energetical aspect, biological oxidations. # Enzymology of nutrient metabolism – catabolism and anabolism – carbohydrates, simple and complex lipids, amino acids, nucleotides, proteins. # Enzyme kinetics. # Basic issues of xenobiochemistry and its attributes. # Integration of metabolism in terms of physiological and pathological conditions of the organism. # Experimental techniques with animal and plant cell cultures. # Plant biochemistry: nitrogen metabolism, enzymology of secondary metabolites, signalling cascades.	
State exam syllabus:	
Recommended literature: D. Voet, J. Voet: Biochemistry, 4th ed., John Wiley & Sons, 2010. G. Litwack: Human Biochemistry, 1st ed., Elsevier, 2017. Selected chapters will be provided in electronic form.	
Languages necessary to complete the course: English language	
Notes: Lecturers: doc. Mgr. Andrea Bilková, PhD.; doc. Mgr. Martina Hrčka Dubníčková, PhD.; doc. PharmDr. Marek Obložinský, PhD.; RNDr. František Bilka, PhD.; Ing. Ľudmila Pašková, PhD.	
Last change: 11.04.2022	

Approved by:

STATE EXAM DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/503-PhD-A/15	Course title: Bioorganic chemistry
Number of credits: 0	
Educational level: III.	
State exam syllabus:	
Last change:	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/426-PhD-A/15	Course title: Citation SCI, SSCI
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: distance learning	
Number of credits: 5	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 0	
ABS	NEABS
0,0	0,0
Lecturers:	
Last change:	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/427-PhD-A/15	Course title: Citation other
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: distance learning	
Number of credits: 3	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 0	
ABS	NEABS
0,0	0,0
Lecturers:	
Last change:	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/405-PhD-A/15	Course title: Co-authorship of teaching aids and texts
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: distance learning	
Number of credits: 10	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 2	
ABS	NEABS
100,0	0,0
Lecturers:	
Last change:	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/410-PhD-A/15	Course title: Co-supervisor of the final work of bachelor study
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: distance learning	
Number of credits: 10	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 0	
ABS	NEABS
0,0	0,0
Lecturers:	
Last change:	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/407-PhD-A/15	Course title: Co-supervisor of the work to attend to Student's scientific conference
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: distance learning	
Number of credits: 10	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 0	
ABS	NEABS
0,0	0,0
Lecturers:	
Last change:	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/429-PhD-A/15	Course title: Completion of a defined stage of the scientific program of the PhD student
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: distance learning	
Number of credits: 5	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 0	
ABS	NEABS
0,0	0,0
Lecturers:	
Last change:	
Approved by:	

STATE EXAM DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/300-PhD-A/15	Course title: Dissertation Work Thesis Defense
Number of credits: 0	
Educational level: III.	
State exam syllabus:	
Last change:	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/430-PhD-A/15	Course title: Dissertation writting, if was taken to the defense
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: distance learning	
Number of credits: 30	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 0	
ABS	NEABS
0,0	0,0
Lecturers:	
Last change:	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/400-PhD-A/15	Course title: Foreign language exam
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: distance learning	
Number of credits: 10	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 0	
ABS	NEABS
0,0	0,0
Lecturers: Mgr. Oľga Hollá, PhDr. Darina Kližanová, PaedDr. Viera Žufková, PhD., Ing. Mgr. Erika Jurišová, PhD.	
Last change:	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/402-PhD-A/15	Course title: Individual study of the scientific literature
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: distance learning	
Number of credits: 5	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 1	
ABS	NEABS
100,0	0,0
Lecturers:	
Last change:	
Approved by:	

STATE EXAM DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/501-PhD-A/15	Course title: Inorganic Chemistry
Number of credits: 0	
Educational level: III.	
Course requirements: Successfully passed exam	
Learning outcomes: Upon the subject completion, PhD student gains a more detailed knowledge of inorganic chemistry that is related to both inorganic chemistry basics as well as current trends with the emphasis on inorganic nanoparticles, their physico-chemical properties and potential biological activity.	
Class syllabus: Properties, electronic structure and chemical reactivity of transition metals that are a basis for the formation of inorganic nanoparticles. The basic principles of coordination chemistry and coordination chemistry of metals. Chemistry of selected p-block elements in relation to modern nanotechnology applications. Inorganic nanoparticles in pharmacy. Synthesis of metal nanoparticles and their physical properties. Experimental methods for the characterisation of nanoparticles. Stabilisation of nanoparticles. Biological activity of nanoparticles and applications.	
State exam syllabus:	
Recommended literature: R. Chang: General Chemistry: The Essential Concepts, McGraw Hill; 7th edition (2013). C. Housecroft, A. Sharpe: Inorganic Chemistry, Pearson, 5th edition (2018). C. Altavilla, E. Ciliberto: Inorganic Nanoparticles. Synthesis, Applications, and Perspectives, CRC Press (2010).	
Languages necessary to complete the course: English language	
Notes: Teachers: doc. Ing. Martin Pisárčik, CSc., Ing. Ladislav Habala, PhD.	
Last change: 03.04.2022	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/424-PhD-A/15	Course title: Involvement in the resolution of another research project
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: distance learning	
Number of credits: 5	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 0	
ABS	NEABS
0,0	0,0
Lecturers:	
Last change:	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/423-PhD-A/15	Course title: Obtaining of "Grant FaF UK for young scientists" (Co-investigator of grant) 5)
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: distance learning	
Number of credits: 10	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 0	
ABS	NEABS
0,0	0,0
Lecturers:	
Last change:	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/422-PhD-A/15	Course title: Obtaining of "Grant FaF UK for young scientists" (Principal Investigator) 5)
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: distance learning	
Number of credits: 15	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 0	
ABS	NEABS
0,0	0,0
Lecturers:	
Last change:	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/421-PhD-A/15	Course title: Obtaining of "University Grant for Young Researchers" (Co - investigator of grant) 5)
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: distance learning	
Number of credits: 10	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 0	
ABS	NEABS
0,0	0,0
Lecturers:	
Last change:	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/420-PhD-A/15	Course title: Obtaining of "University Grant for Young Researchers" (Principal Investigator) 5)
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: distance learning	
Number of credits: 20	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 2	
ABS	NEABS
100,0	0,0
Lecturers:	
Last change:	
Approved by:	

STATE EXAM DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/502-PhD-A/15	Course title: Organic Chemistry
Number of credits: 0	
Educational level: III.	
Course requirements: Completion of prescribed PhD lectures and seminars; passing the exam.	
Learning outcomes: After completing the course, the PhD student is able to work independently in all areas of drug development and not only where knowledge of organic chemistry is required. The course provides a comprehensive preparation of theoretical organic chemistry, as well as practical training in the field of organic synthesis focusing on the field of selected pharmaceutically important compounds. The gained knowledge and skills are necessary for the completion of the other chemical courses and are also needed for the pharmaceutically oriented courses, e.g. Pharmaceutical Chemistry, Biochemistry, Analytical Chemistry, Pharmacology, Toxicology, Pharmaceutical Technology.	
Class syllabus: The theoretical teaching contains basic principles of chemical bonds origin and the spatial structure of organic compounds with a reflection on their physical-chemical properties. The main attention is paid to the individual sorts of stereoisomerism, electron effects, acid-based characteristics and salt forming, to the development and significance of conjugated and aromatic systems, and, first and foremost in terms of reactivity and behaviour in biological systems. The main attention is also paid to systematic organic chemistry. According to each group of compounds the course deals with their physical-chemical characteristics, properties, reactivity, types and mechanisms of reactions with emphasis on the importance in chemistry of pharmaceuticals and other following chemical courses of pharmaceutical study. As for natural substances only basic knowledge is provided. When teaching the subject emphasis is placed on the use of acquired knowledge of organic chemistry in pharmacy and medicine.	
State exam syllabus:	
Recommended literature: Devínsky F. et al. Organic Chemistry for Pharmacy Students. Comenius University Press, Bratislava, 2010.. Favre a, Powell, H.: Nomenclature of Organic Chemistry, Royal Society of Chemistry, 2014, 1068 s. Čižmáriková R.: Laboratory manual for practice in organic chemistry. Comenius University Press, Bratislava, 2012	
Languages necessary to complete the course: English language	
Notes: Lecturers: doc. PharmDr. Miloš Lukáč, PhD., doc. PharmDr. Jindra Valentová, PhD.	
Last change: 10.04.2022	

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/406-PhD-A/15	Course title: Participation in the management of the thesis in Master's degree
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: distance learning	
Number of credits: 15	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 0	
ABS	NEABS
0,0	0,0
Lecturers:	
Last change:	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/403-PhD-A/15	Course title: Passing other subject of the offer 2) of other university faculties
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: distance learning	
Number of credits: 0	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 0	
ABS	NEABS
0,0	0,0
Lecturers:	
Last change:	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/401-PhD-A/15	Course title: Passing prescribed doctoral lectures and seminars 1)
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: distance learning	
Number of credits: 10	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 1	
ABS	NEABS
100,0	0,0
Lecturers:	
Last change:	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/411-PhD-A/15	Course title: Passing the Dissertation exam
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: distance learning	
Number of credits: 20	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 0	
ABS	NEABS
0,0	0,0
Lecturers:	
Last change:	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/409-PhD-A/15	Course title: Pedagogical activities - seminars
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: distance learning	
Number of credits: 15	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 0	
ABS	NEABS
0,0	0,0
Lecturers:	
Last change:	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/408-PhD-A/15	Course title: Pedagogical activity - exercises
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: distance learning	
Number of credits: 10	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 1	
ABS	NEABS
100,0	0,0
Lecturers:	
Last change:	
Approved by:	

STATE EXAM DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/800-PhD-A/15	Course title: Pharmacology
Number of credits: 0	
Educational level: III.	
Course requirements: Successful passing of the exam	
Learning outcomes: Expansion and intensification of knowledge from pharmacology the can be used by the student to formulate scientific hypotheses to create a basis for the analytical part of the dissertation and to formulate conclusions following the obtained results.	
Class syllabus: The focus is on one or more of the following areas of pharmacology: - pharmacodynamics with respect to the mechanism of action of drugs - pharmacokinetics - pharmacogenomics - adverse effects of drugs - drug overdose - therapeutic use of drugs Special pharmacology - pharmacology of drugs with effect on the central nervous system - pharmacology of drugs with effect on the autonomous nervous system - pharmacology of drugs with effect on the smooth muscles - pharmacology of drugs with effect on the cardiovascular system and kidneys - pharmacology of blood, inflammation - pharmacology of drugs with effect on the respiratory system - pharmacology of drugs with effect on the gastrointestinal system - pharmacology of drugs with effect on the endocrine system - pharmacology of anti-infective drugs - pharmacology of anticancer drugs - new directions of therapy of diseases using biological drugs	
State exam syllabus:	
Recommended literature: Brunton LL, Hilal-Dandan R, Knollmann BC et al. Goodman & Gilman's: The Pharmacological Basis of Therapeutics, 13e, McGraw-Hill Education 2018 Golan D. E., Tashjian Jr A. H., Armstrong E. J., Armstrong A. Wet al. .: Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy, 3rd 4th Edition. Lippincott Williams&Wilkins, 20172 Katzung BG, Vanderah TW et al. : Basic & Clinical Pharmacology, 15e, McGraw Hill 2021 Rang, H.P., Dale, M.M. a kol.: Rang and Dale's Pharmacology, 7th ed. London, Churchill Livingstone, Elsevier, 2012	

Ritter JM. et al.: Rang and Dale's Pharmacology E-Book, Elsevier, 9th ed., 2018
Languages necessary to complete the course: English language
Notes: Lecturers: prof. PharmDr. Adriana Ďuriš Adameová, PhD.; prof. PharmDr. Ján Klimas, PhD., MPH.; doc. Peter Křenek, PhD.; doc. PharmDr. Anna Paul Hrabovská, PhD.; doc. PharmDr. Marek Máťuš, PhD.; Mgr. Peter Vavrinec, PhD.; Mgr. Diana Vavrincová, PhD
Last change: 11.04.2022
Approved by:

STATE EXAM DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/505-PhD-A/15	Course title: Physical Chemistry
Number of credits: 0	
Educational level: III.	
Course requirements: final exam	
Learning outcomes: The course is intended to provide the necessary theoretical background for understanding of physicochemical principles in specialized areas: preparation and optimization of drugs formulae, analysis and testing of drugs, mechanism of drug action at molecular level, drug absorption, transport across biological membranes, pharmacodynamics and pharmacokinetics. Physical background of experimental methods used for development of new drugs and mechanisms of their action is emphasized.	
Class syllabus: Physical chemistry builds upon the knowledge from physics and mathematics and is linked with additional chemical, biological and pharmaceutical areas. The scope of the subject: Structure of atoms and molecules. Chemical bonds, intermolecular interactions. Thermodynamics, phase transitions, solutions, partition equilibria, condensed systems. Electrochemistry, solutions of electrolytes, potentiometry. Chemical kinetics, reaction rates and orders, mechanism of chemical reactions. Catalysis, enzymatic catalysis. Kinetics of drug release from drug formulae. Colloidal systems, dispersions, surface phenomena, membrane phenomena. Physical chemistry of biological membranes. Membrane channels. Passive and active transport. Lipids in drug delivery. Lyotropic and thermotropic polymorphism of lipids and methods for its study. Lipid-based nanoparticles in targeted drug delivery. Experimental methods: UV-VIS, fluorescence, IR, Raman, NMR spectroscopy, diffraction, DSC calorimetry, mass spectrometry.	
State exam syllabus:	
Recommended literature: Atkins, P. W.: Physical Chemistry, 6th edition, Oxford University Press, 1998 Amiji M.M., Sandmann B.J.: Applied Physical Pharmacy. New York: McGraw-Hill, 2003 Cevc G.: Phospholipids handbook. Marcel Dekker, Inc. New York (1993) Mouritsen O.G.: Life – as a matter of fat. The emerging science of lipodomies. Springer – Verlag Berlin Heidelberg (2005) Serdyuk I.N., Zaccai N.R., Zaccai J.: Methods in Molecular Biophysics. Structure, Dynamics, Function. Cambridge University Press, 2007	
Languages necessary to complete the course: English language	
Notes:	

Lecturers: prof. Ing. Vladimír Frečer, DrSc., prof. RNDr. Daniela Uhríková, CSc., doc. RNDr. Jana Gallová, CSc., RNDr. Alexander Búcsi, PhD., Mgr. Mária Klacsová, PhD., Mgr. Norbert Kučerka, DrSc.
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Last change: 11.04.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/428-PhD-A/15	Course title: Presentation at the conference of young scientists
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: distance learning	
Number of credits: 5	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 0	
ABS	NEABS
0,0	0,0
Lecturers:	
Last change:	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/417-PhD-A/15	Course title: Professional publications in domestic journal
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: distance learning	
Number of credits: 4	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 1	
ABS	NEABS
100,0	0,0
Lecturers:	
Last change:	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/416-PhD-A/15	Course title: Professional publications in international journals
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: distance learning	
Number of credits: 7	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 0	
ABS	NEABS
0,0	0,0
Lecturers:	
Last change:	
Approved by:	

STATE EXAM DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/900-PhD-A/15	Course title: Retail Pharmacy and Social Pharmacy
Number of credits: 0	
Educational level: III.	
Course requirements: Successful completion of the exam.	
Learning outcomes: Social pharmacy - pharmacy enables the third-level doctoral student to develop theoretical knowledge and apply their skills to the social and economic aspects of the position of drugs and medicines in society. The necessary content is language training, enabling to confront the state and knowledge of individual aspects of medicine and drug in society abroad.	
Class syllabus: Theoretical problems of pharmacy and medicines in society - characteristics of medicines, ensuring the way and safety of medicines from their origin to use in the individual patient, 2. The share of pharmacy in social and health policy - WHO pharmaceutical programs, 3. Drug policy - legislation, system application, management systems, marketing application, consumption and need for drugs and medicines, 4. Pharmaceutical and pharmaceutical care - research, production, control of drugs and medicines, dispensing and provision of information, implementation of good manufacturing, distribution and pharmaceutical practice, 5. Pharmaceutical informatics - content, scope, programs and their use, drug compliance and abuse, self-treatment and its pharmaceutical aspects 6. Drug and society - position and importance of drug, pharmacoepidemiology, compliance, non-compliance, consumption and need for drugs, pharmacoconomics, pharmaceutical informatics, 7. The position of pharmacy in society and healthcare - social, health and drug policy, management and marketing of pharmaceutical activities, legislative aspects of drug policy implementation, 8. History of pharmacy and museology - the position of the drug in the various stages of social development.	
State exam syllabus:	
Recommended literature: 1. Kelly, W. N. Pharmacy. What It Is and How It Works. 2012, third edition. CRC Press, Taylor & Francis Group, LLC. 2012, 452p. ISBN 978-1-4398-5305-4. 2. Royal Pharmaceutical Society. Medicines, Ethics and Practice. The professional guide for pharmaceuticals. Edition 39, July 2015, 202p. 3. Desselle, S. P., Zgarrick, D P., Alston, G. L. Pharmacy Management. 2010, 3rd ed., American Society of Health-System Pharmacists, Med Graw Hill Inc. 2010, 715p, ISBN 978-0-07-177431-4. 4. Donyai, P. Social and Cognitive Pharmacy. Theory and Case Studies. 2012. PhP Pharm. Press, UK. 2012, 229 p. ISBN-978-0-8536-9-899-9.	

5. Carter, J., Slack M., Pharmacy in Public Health. Basics and Beyond. 2010. American Soc. Health-System Pharmacists, Inc. 2010, 390p. ISBN 978-1-58528-172-5.
6. Berger, M. L. et al. Health Care Cost, Quality, and Outcomes. 2003. International Society for Pharmacoeconomics and Outcomes Research. 2003, 264p. ISBN 0-9743289-0-1
7. Sexton, J., Nickless G., Green, Ch.: Pharmaceutical Care Made Easy, London, Pharmaceutical Press, 2006, 178 p.
8. Edwards, C., Stillman, P.: Minor Illness or Major Disease? The clinical pharmacist in the community. Fourth edition, London, Pharmaceutical Press, 2006, 285 p.
9. Stephens, M.: Hospital Pharmacy, London, Pharmaceutical Press, 2006, 285 p.
10. Harman, R.J.: Patient Care in Community Practice, London, Pharmaceutical Press, 2002, 203 p.
11. Harman, R.J.: Handbook of Pharmacy Health Education, second edition, London, Pharmaceutical Press, 2001, 299 p.

Languages necessary to complete the course:

English language

Notes:

Teachers: doc. PharmDr. Tomáš Tesař, PhD., MBA, MPH, MSc (HTA), doc. PharmDr. Daniela Mináriková, PhD., MSc.

Last change: 08.04.2022

Approved by:

STATE EXAM DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/508-PhD-A/15	Course title: Stereochemistry
Number of credits: 0	
Educational level: III.	
State exam syllabus:	
Last change:	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/415-PhD-A/15	Course title: The original publication in non current contents domestic journals or conference proceedings
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: distance learning	
Number of credits: 7	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 1	
ABS	NEABS
100,0	0,0
Lecturers:	
Last change:	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/414-PhD-A/15	Course title: The original publication in non current contents international journals or conference proceedings
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: distance learning	
Number of credits: 15	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 2	
ABS	NEABS
100,0	0,0
Lecturers:	
Last change:	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/413-PhD-A/15	Course title: The original publication in peer-reviewed domestic journal
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: distance learning	
Number of credits: 30	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 0	
ABS	NEABS
0,0	0,0
Lecturers:	
Last change:	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/412-PhD-A/15	Course title: The original publication in peer-reviewed international journals
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: distance learning	
Number of credits: 35	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 1	
ABS	NEABS
100,0	0,0
Lecturers:	
Last change:	
Approved by:	