

Course descriptions

TABLE OF CONTENTS

1. 457-PhD/21	Active Participation in the Scientific Events 1.....	3
2. 458-PhD/21	Active Participation in the Scientific Events 2.....	5
3. 468-PhD/21	Active Participation in the Scientific Events 3.....	7
4. 469-PhD/21	Active Participation in the Scientific Events 4.....	9
5. 504-PhD/11	Analytical Chemistry (state exam).....	11
6. 509-PhD/21	Analytical Monitoring of Drug Levels in Practice (state exam).....	15
7. 480-PhD/21	Authorship of Teaching Aids and Texts.....	19
8. 506-PhD/11	Biochemistry (state exam).....	20
9. 478-PhD/21	Citation Other.....	22
10. 477-PhD/21	Citation SCI, SSCI.....	23
11. 481-PhD/21	Co-authorship of Teaching Aids and Texts.....	24
12. 488-PhD/21	Completing Other Subject of the Offer of Other University Faculties.....	25
13. 451-PhD/21	Completing Prescribed Doctoral Lectures and Seminars 1.....	26
14. 452-PhD/21	Completing Prescribed Doctoral Lectures and Seminars 2.....	28
15. 453-PhD/21	Completing Selected Doctoral Lectures and Seminars.....	30
16. 489-PhD/21	Completion of a Defined Stage of the PhD Scientific Program.....	32
17. 302-PhD/22	Dissertation Thesis and its Defence (state exam).....	33
18. 456-PhD/21	Elaboration of a Manuscript of a Scientific Publication in a Foreign Language as the First Author.....	34
19. 432-PhD/21	English Language and Foreign Language Exam.....	36
20. 470-PhD/21	Individual Study of the Scientific Literature.....	37
21. 501-PhD/11	Inorganic Chemistry (state exam).....	38
22. 455-PhD/21	Introduction to Scientific Research.....	39
23. 454-PhD/21	Introduction to Scientific Writing in English Language.....	41
24. 483-PhD/21	Management of Student Scientific Activities.....	43
25. 473-PhD/21	Obtaining the "Grant FaF UK for Young Scientists" (Principal Investigator).....	45
26. 474-PhD/22	Obtaining the "Grant FaF UK for Young Scientists" (Co-investigator of Grant).....	46
27. 472-PhD/21	Obtaining the "University Grant for Young Researchers" (Co-investigator of Grant).....	47
28. 471-PhD/21	Obtaining the "University Grant for Young Researchers" (Principal Investigator).....	48
29. 502-PhD/11	Organic Chemistry (state exam).....	49
30. 476-PhD/21	Other Activities (eg. a Member of the Organizing Committee of the Conference).....	50
31. 475-PhD/22	Participation in the Implementation of Another Research Project.....	52
32. 482-PhD/21	Participation in the Management of the Thesis in Master's Degree.....	53
33. 431-PhD/21	Passing the Dissertation Exam (state exam).....	55
34. 485-PhD/21	Pedagogical Activities - Seminars.....	56
35. 484-PhD/21	Pedagogical Activities - Exercises.....	58
36. 500-PhD/11	Pharmaceutical Chemistry (state exam).....	60
37. 812-PhD/21	Pharmaceutical Technology (state exam).....	62
38. 800-PhD/11	Pharmacology (state exam).....	64
39. 505-PhD/11	Physical Chemistry (state exam).....	66
40. 479-PhD/21	Presentation at the Conference of Young Scientists.....	68
41. 465-PhD/21	Professional Publication in International or Domestic Journal.....	70
42. 466-PhD/21	Published Abstract in English from a Scientific Event.....	72

43. 487-PhD/21	Reviewing a Bachelor Thesis.....	74
44. 467-PhD/21	Reviewing the Manuscript of an Article Submitted to an Indexed Scientific Journal (Scopus, Wos).....	75
45. 486-PhD/21	Supervision of the Final Bachelor's Thesis.....	76
46. 460-PhD/21	The Original Publication in Current Contents Journal.....	78
47. 459-PhD/21	The Original Publication in Current Contents Journal – First Author.....	80
48. 463-PhD/21	The Original Publication in non-Current Contents International or Domestic Journal Indexed in the SCOPUS Database (EPJ is Recommended).....	82
49. 462-PhD/21	The Original Publication in non-Current Contents Journal with IF (Impact Factor).....	84
50. 461-PhD/21	The Original Publication in non-Current Contents Journal with IF (Impact Factor) - First Author.....	86
51. 464-PhD/21	The Original Scientific Publication in non-Current Contents and non-Indexed International or Domestic Journal or Conference Proceeding.....	88

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/457-PhD/21	Course title: Active Participation in the Scientific Events 1
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning, distance learning	
Number of credits: 4	
Recommended semester: 1., 2., 3., 4., 5., 6., 7., 8..	
Educational level: III.	
Prerequisites:	
Course requirements: The doctoral student obtains the rating completed with a credit value after submitting the program of scientific events (in which he / she is an active participant) to the supervisor, which is also evidenced by confirmations of the organizers of scientific events about active performance.	
Learning outcomes: the doctoral student under the guidance of the supervisor has demonstrated the ability to work scientifically, ie to create scientific texts that meet the criteria of expertise, scientific and methodological relevance and then present these texts to the audience at a scientific event (conference, scientific seminar, congress).	
Class syllabus: 1. The doctoral student, after consultation with the supervisor, shall develop scientific texts that meet the criteria of professionalism, scientific and methodological relevance. 2. The doctoral student will individually ensure participation in a scientific event (conference, scientific seminar, congress), at which he / she will actively present and present the results of his / her own scientific activity. 3. The doctoral student respects the ethics of publishing, each scientific text is original and the doctoral student presents it only once, while the translation of the content of the original scientific text is not considered as another original scientific text and it is inadmissible for the doctoral student to present it repeatedly.	
Recommended literature: Current sources on the presented issues.	
Languages necessary to complete the course: the language in which the conference is organized	
Notes: Teacher: supervisor	
Past grade distribution Total number of evaluated students: 0	
Lecturers:	

Last change: 18.04.2022

Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/458-PhD/21	Course title: Active Participation in the Scientific Events 2
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning, distance learning	
Number of credits: 4	
Recommended semester: 1., 2., 3., 4., 5., 6., 7., 8..	
Educational level: III.	
Prerequisites:	
Course requirements: The doctoral student obtains the rating completed with a credit value after submitting the program of scientific events (in which he / she is an active participant) to the supervisor, which is also evidenced by confirmations of the organizers of scientific events about active performance.	
Learning outcomes: the doctoral student under the guidance of the supervisor has demonstrated the ability to work scientifically, ie to create scientific texts that meet the criteria of expertise, scientific and methodological relevance and then present these texts to the audience at a scientific event (conference, scientific seminar, congress).	
Class syllabus: 1. The doctoral student, after consultation with the supervisor, shall develop scientific texts that meet the criteria of professionalism, scientific and methodological relevance. 2. The doctoral student will individually ensure participation in a scientific event (conference, scientific seminar, congress), at which he / she will actively present and present the results of his / her own scientific activity. 3. The doctoral student respects the ethics of publishing, each scientific text is original and the doctoral student presents it only once, while the translation of the content of the original scientific text is not considered as another original scientific text and it is inadmissible for the doctoral student to present it repeatedly.	
Recommended literature: Current sources on the presented issues.	
Languages necessary to complete the course: the language in which the conference is organized	
Notes: Teacher: supervisor	
Past grade distribution Total number of evaluated students: 0	
Lecturers:	

Last change: 18.04.2022

Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/468-PhD/21	Course title: Active Participation in the Scientific Events 3
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning, distance learning	
Number of credits: 4	
Recommended semester: 1., 2., 3., 4., 5., 6., 7., 8..	
Educational level: III.	
Prerequisites:	
Course requirements: The doctoral student obtains the rating completed with a credit value after submitting the program of scientific events (in which he / she is an active participant) to the supervisor, which is also evidenced by confirmations of the organizers of scientific events about active performance.	
Learning outcomes: the doctoral student under the guidance of the supervisor has demonstrated the ability to work scientifically, ie to create scientific texts that meet the criteria of expertise, scientific and methodological relevance and then present these texts to the audience at a scientific event (conference, scientific seminar, congress).	
Class syllabus: 1. The doctoral student, after consultation with the supervisor, shall develop scientific texts that meet the criteria of professionalism, scientific and methodological relevance. 2. The doctoral student will individually ensure participation in a scientific event (conference, scientific seminar, congress), at which he / she will actively present and present the results of his / her own scientific activity. 3. The doctoral student respects the ethics of publishing, each scientific text is original and the doctoral student presents it only once, while the translation of the content of the original scientific text is not considered as another original scientific text and it is inadmissible for the doctoral student to present it repeatedly.	
Recommended literature: Current sources on the presented issues.	
Languages necessary to complete the course: the language in which the conference is organized	
Notes: Teacher: supervisor	
Past grade distribution Total number of evaluated students: 0	
Lecturers:	

Last change: 18.04.2022

Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/469-PhD/21	Course title: Active Participation in the Scientific Events 4
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning, distance learning	
Number of credits: 4	
Recommended semester: 1., 2., 3., 4., 5., 6., 7., 8..	
Educational level: III.	
Prerequisites:	
Course requirements: The doctoral student obtains the rating completed with a credit value after submitting the program of scientific events (in which he / she is an active participant) to the supervisor, which is also evidenced by confirmations of the organizers of scientific events about active performance.	
Learning outcomes: the doctoral student under the guidance of the supervisor has demonstrated the ability to work scientifically, ie to create scientific texts that meet the criteria of expertise, scientific and methodological relevance and then present these texts to the audience at a scientific event (conference, scientific seminar, congress).	
Class syllabus: 1. The doctoral student, after consultation with the supervisor, shall develop scientific texts that meet the criteria of professionalism, scientific and methodological relevance. 2. The doctoral student will individually ensure participation in a scientific event (conference, scientific seminar, congress), at which he / she will actively present and present the results of his / her own scientific activity. 3. The doctoral student respects the ethics of publishing, each scientific text is original and the doctoral student presents it only once, while the translation of the content of the original scientific text is not considered as another original scientific text and it is inadmissible for the doctoral student to present it repeatedly.	
Recommended literature: Current sources on the presented issues.	
Languages necessary to complete the course: the language in which the conference is organized	
Notes: Teacher: supervisor	
Past grade distribution Total number of evaluated students: 0	
Lecturers:	

Last change: 18.04.2022

Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.

STATE EXAM DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/504-PhD/11	Course title: Analytical Chemistry
Number of credits: 0	
Educational level: III.	
Course requirements: Successful completion of the exam.	
<p>Learning outcomes:</p> <p>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.</p>	
<p>Class syllabus:</p> <p>Analysis of organic bioactive substances, levels of drugs and their metabolites, degradation products and biomarkers of diseases in biological materials (blood, urine, tissues, etc.).</p> <p>Analysis of new organic molecules (potential drugs and drug carriers for innovative dosage forms) in reaction mixtures from organic syntheses and isolated products.</p> <p>Inorganic analysis of biogenic and toxic elements in individual components of the environment (air, soil, herbal drugs, water).</p> <p>Bioinorganic analysis of new metal complexes in reaction mixtures from organic syntheses and isolated products.</p> <p>Use of modern instrumental techniques:</p> <ul style="list-style-type: none"> • 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., Piešťanský, J., Dokupilová, S.: Kvapalinová chromatografia, hmotnostná spektrometria a ich kombinácie vo farmaceutickej a biomedicínskej analýze, VEDA, Bratislava, 2018. 365s.
Mikuš, P., Piešťanský, J.: Kapilárna elektroforéza, hmotnostná spektrometria a ich kombinácie vo farmaceutickej a biomedicínskej analýze, VEDA, 2014. 310 s.
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.
Tekel', J., Mikuš, P.: Vybrané kapitoly z analytickej chémie. Analýza látok v biologických systémoch. Bratislava : UK, 2004, 192 s
Světlik, J.: Molekulová spektroskopia a optické metódy. Bratislava : UK, 2006. 81 s.
Garaj, J., Bustín, D., Hladký, Z.: Analytická chémie. Bratislava, Alfa 1989. 740 s.
Havránek, E. a kol.: Laboratórne cvičenia z analytickej chémie III. Fyzikálno-chemické metódy. Bratislava : UK, 2007. 91 s.
Křenek, P.: Analýza organických látok. Bratislava : UK, 2007. 80 s.
Vybrané kapitoly budú poskytnuté v elektronickej forme.

Languages necessary to complete the course:

Slovak 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:

STATE EXAM DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/509-PhD/21	Course title: Analytical Monitoring of Drug Levels in Practice
Number of credits: 0	
Educational level: III.	
Course requirements: Successful completion of the exam.	
<p>Learning outcomes:</p> <p>Reliable identification and quantification of drugs in biological systems are essential steps to understand the mechanisms of their action in a living organism. Drug concentration levels are an important indicator of the therapeutic process at the molecular level, usable in optimizing the treatment management of individual patients.</p> <p>Therapeutic drug monitoring (TDM) is recommended and performed for (i) drugs with a narrow therapeutic range, (ii) drugs with a well-defined relationship between drug concentration and effect (therapeutic or toxic), (iii) drugs with large inter- or intra-individual differences in drug distribution or clearance. Integral components of TDM are (I) collection and processing of biological material, (II) development, validation and application of analytical methods, and (III) processing and interpretation of analysis results. Interpretation of TDM results requires adequate knowledge of the pharmacokinetics and pharmacodynamics of the monitored drugs and their association with the patient's clinical data. Thus, for the successful implementation of TDM in clinical practice, it is necessary to combine theoretical knowledge and practical aspects of methods of clinical analysis and clinical pharmacology. In a broader context, monitoring of biologically active substance levels is also carried out in the areas of disease diagnosis, toxicology, doping control, forensic analysis and other practical areas. The graduate of the course will gain knowledge related to the development and application of analytical methods and procedures usable in solving the tasks of the above areas of pharmaceutical practice.</p> <p>The doctoral students will expand and deepen their knowledge of the latest findings in the field of analytical monitoring of drug levels in practice in connection with the relevant analytical methodology and clinical aspects of the analyzed substances. They will be able to apply the acquired knowledge in practice at various levels of activity in connection with optimization of therapeutic procedures, early diagnosis of diseases, assessment of patient compliance, assessment of intoxication or presence / levels of banned, narcotic and psychotropic substances in the biological system in cooperation with physicians, clinical, diagnostic, toxicological, anti-doping or forensic laboratories.</p>	
<p>Class syllabus:</p> <p>The basic concepts/terms, principles, methodological and clinical aspects, validation and application areas of the master's curriculum are continuously supplemented with current knowledge/findings and solutions to the problems of analytical monitoring of drug levels in practice.</p> <ul style="list-style-type: none"> . Introduction to the issue # Clarification of the term “therapeutic drug monitoring” # Importance of TDM in clinical practice (current state of the issue) # Analytical aspects in TDM 	

Pharmacological aspects in TDM

Monitoring the levels of biologically active substances for toxicological, doping and forensic analysis

. Groups of therapeutically monitored drugs

Drugs with a narrow therapeutic range

Drugs with a well-defined relationship between drug concentration and effect (therapeutic or toxic)

Drugs with large inter- or intra-individual differences in drug distribution or clearance

Distribution of drug groups (by effect)

Antibiotics with nephrotoxic and ototoxic effects (aminoglycosides amikacin, gentamicin, netilmicin, tobramycin, polypeptide antibiotic vancomycin)

Cardiovascular drugs (cardioglycosides: digoxin, antidysrhythmics: quinidine)

Antiepileptics (carbamazepine, ethosuximide, phenobarbital, phenytoin, primidone, valproic acid)

Tricyclic antidepressants (amitriptyline, imipramine, clomipramine)

Antiasthmatics (theophylline)

Immunosuppressants (cyclosporin A, tacrolimus, azathioprine, 6-mercaptopurine, 6-thioguanine)

Cytostatics (methotrexate)

. Groups of other monitored substances

Diagnostic biomarkers - endogenous substances

Low molecular weight organic substances (amino acids, carboxylic acids, biogenic amines, lipids, etc.)

Inorganic ions (metal cations, anions)

Biomolecules (proteins, e.g., enzymes, antibodies)

Toxic and prohibited substances (doping, drugs, poisoning) and drugs applied without the consent of a doctor (self-treatment) - exogenous substances

Commercial drugs (clenbuterol, ivermectin, etc.)

Experimental drugs (SARMS, etc.)

Illegal synthetic preparations (heroin, etc.)

Natural toxins (amanitin, botulinum toxin, etc.)

. Collection and processing of biological material

Sampling (method, time intervals), steady state, number of samples, residual and peak concentration vs. toxicity and therapeutic effect

Sample processing (sample type, sample preparation before analysis, sample preparation techniques / methods - protein precipitation, extraction, derivatization, protein cleavage, etc.)

Sample storage

. Methods of biological material analysis

Development (optimization), validation and application of analytical methods, advantages and limitations of analytical methods

Spectral methods

Electrochemical methods

Separation methods (chromatographic, electromigration)

Hyphenated separation and spectral or electrochemical methods

Separation methods with on-line sample preparation

Immunochemical methods: radioimmunoassay (RIA), immunoenzyme methods (EIA, EMIT, ELISA, FPIA, MEIA, CMIA)

. Interpretation of analytical results

TDM: Interpretation of serum drug concentrations in the context of all clinical data (related areas: pharmacokinetics and pharmacodynamics of drugs)

Diagnosis of diseases: correlations of levels of individual biomarkers or biomarker profiles in comparison groups (monitoring of changes in datasets of health vs patients)

Toxicological, anti-doping, forensic analysis: monitoring of levels of monitored substances, limit concentrations

. Statistical evaluation of the analytical results

Validation parameters according to the used validation protocol

Validation protocols: FDA, ICH

Hypothesis testing (Student's t-test, ANOVA)

Use of therapeutic drug level monitoring data:

Objective: to ensure maximum efficacy of drugs, to reduce the risk of drug toxicity, to maintain the concentration of drugs in the so-called "Therapeutic range"

Monitoring of treatment of chronically and critically ill patients with altered drug clearance with a narrow therapeutic range, patients with different drug pharmacokinetics (elderly, children)

Adjust batch modes (regimes)

Optimization of therapy using pharmacokinetic programs (population-kinetic data)

Determining patients' compliance with treatment

Identification of drug toxicity risks (reduction of toxic drug reactions)

Reduction of treatment costs

Reducing the need for emergency procedures and hospitalizations

Shortening the length of hospitalization

Application areas - solved examples:

TDM of thiopurines in the optimization of therapy of patients with non-specific inflammatory bowel diseases

Monitoring of carboxylate levels in connection with the diagnosis and therapy of cancer patients

Monitoring of Prohibited Substance Levels (Clenbuterol, SARMS) in connection with doping control

State exam syllabus:

Recommended literature:

- Mikuš, P., Piešťanský, J., Dokupilová, S.: Kvapalinová chromatografia, hmotnostná spektrometria a ich kombinácie vo farmaceutickej a biomedicínskej analýze, VEDA, Bratislava, 2018. 365s.
- Mikuš, P., Piešťanský, J.: Kapilárna elektroforéza, hmotnostná spektrometria a ich kombinácie vo farmaceutickej a biomedicínskej analýze, VEDA, 2014. 310 s.
- Mikuš, P., Maráková, K.: HYPHENATED ELECTROPHORETIC TECHNIQUES IN ADVANCED ANALYSIS, Bratislava, KARTPRINT, 2012. 217 s.
- Tekel', J., Mikuš, P.: Vybrané kapitoly z analytickej chémie. Analýza látok v biologických systémoch. Bratislava : UK, 2004, 192 s.
- Mikuš, P., Hanko, M., Piešťanský, J., Maráková, K., Dokupilová, S., Mikulová, M.: Analytical chemistry: Instrumental analysis. Bratislava : VEDA, pripravuje sa.
- Havránek, E. a kol.: Laboratórne cvičenia z analytickej chémie III. Fyzikálno-chemické metódy. Bratislava : UK, 2007. 91 s.
- Světlík, J.: Molekulová spektroskopia a optické metódy. Bratislava : UK, 2006. 81 s.
- Labuda, J. a kol., Analytická chémia, Bratislava, STU v Bratislave, 2019, 682 s.
- Magulová, L.: Metodický list racionálnej farmakoterapie 15./16., Terapeutické monitorovanie hladín liečiv, Ročník 5, Číslo 1-2, 2001. (plus citovaná literatúra)
- Vedecké publikácie registrované v databáze Web of Science: kľúčové slová: Mikus (author), Comenius (Address), amino acids, biogenic amines, thiopurines (Topic)

Languages necessary to complete the course:

Slovak language, English language
Notes: Teacher: prof. RNDr. Peter Mikuš, PhD., PharmDr. Juraj Piešťanský, PhD.
Last change: 05.04.2022
Approved by:

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/480-PhD/21	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: on-site learning, distance learning	
Number of credits: 20	
Recommended semester: 1., 2., 3., 4., 5., 6., 7., 8..	
Educational level: III.	
Prerequisites:	
Course requirements: The doctoral student obtains the rating completed with a credit value after submitting the teaching aid or text (source cover, circulation letters with ISBN or ISSN) to the supervisor.	
Learning outcomes: the doctoral student under the guidance of the supervisor demonstrated the ability to work in the preparation and writing of teaching aids and texts.	
Class syllabus: The doctoral student, after consultation with the supervisor, works on the preparation and writing of teaching aids with the co-authors and the editorial staff.	
Recommended literature: Current sources on the presented issues.	
Languages necessary to complete the course: Slovak language, English language	
Notes: Teacher: supervisor	
Past grade distribution Total number of evaluated students: 0	
Lecturers:	
Last change: 18.04.2022	
Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.	

STATE EXAM DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/506-PhD/11	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. D. Dobrota a kol.: Lekárska biochémia, Osveta, Martin, 2016. G. Litwack: Human Biochemistry, 1st ed., Elsevier, 2017. Selected chapters will be provided in electronic form.	
Languages necessary to complete the course: Slovak language	
Notes: Lecturers: doc. Mgr. Andrea Bilková, PhD.; doc. Mgr. Martina Hrčka Dubničková, PhD.; doc. PharmDr. Marek Obložinský, PhD.; RNDr. František Bilka, PhD.; Ing. Ľudmila Pašková, PhD.	
Last change: 11.04.2022	

Approved by:

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/478-PhD/21	Course title: Citation Other
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning, distance learning	
Number of credits: 3	
Recommended semester: 1., 2., 3., 4., 5., 6., 7., 8..	
Educational level: III.	
Prerequisites:	
Course requirements: The doctoral student obtains the rating completed with a credit value after submitting the sections (source cover, circulation letters with ISBN or ISSN, source content, paper), in which there is another citation of the doctoral student's scientific work such as SCI and SSCI.	
Learning outcomes: the doctoral student under the guidance of a supervisor has demonstrated the ability of quality scientific work and self-presentation.	
Class syllabus: As part of his / her scientific work, the doctoral student establishes cooperation with scientific authorities of domestic and foreign origin and supports the promotion of the results of his / her own scientific publishing activity in the scientific area, while monitoring the citation of his / her outputs in other databases except SCI and SSCI.	
Recommended literature: Current sources on the presented issues.	
Languages necessary to complete the course: Slovak language, English language	
Notes: Teacher: supervisor	
Past grade distribution Total number of evaluated students: 0	
Lecturers:	
Last change: 18.04.2022	
Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.	

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/477-PhD/21	Course title: Citation SCI, SSCI
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning, distance learning	
Number of credits: 5	
Recommended semester: 1., 2., 3., 4., 5., 6., 7., 8..	
Educational level: III.	
Prerequisites:	
Course requirements: The doctoral student obtains the rating completed with credit value after submitting the sections (source cover, circulation letters with ISBN or ISSN, source content, paper), which contains a citation of the doctoral student's scientific work defined as SCI and SSCI.	
Learning outcomes: the doctoral student under the guidance of a supervisor has demonstrated the ability of quality scientific work and self-presentation.	
Class syllabus: As part of his / her scientific work, the doctoral student establishes cooperation with scientific authorities of domestic and foreign origin and supports the promotion of the outputs of his / her own scientific publishing activity in the scientific area, while monitoring the citation response of his / her outputs in the relevant databases.	
Recommended literature: Current sources on the presented issues.	
Languages necessary to complete the course: Slovak language, English language	
Notes: Teacher: supervisor	
Past grade distribution Total number of evaluated students: 0	
Lecturers:	
Last change: 18.04.2022	
Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.	

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/481-PhD/21	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: on-site learning, distance learning	
Number of credits: 10	
Recommended semester: 1., 2., 3., 4., 5., 6., 7., 8..	
Educational level: III.	
Prerequisites:	
Course requirements: The doctoral student obtains the rating completed with a credit value after submitting the teaching aid or text (source cover, circulation letters with ISBN or ISSN) to the supervisor.	
Learning outcomes: the doctoral student under the guidance of the supervisor demonstrated the ability to cooperate and co-participate in the preparation and writing of teaching aids and texts.	
Class syllabus: The doctoral student, after consultation with the supervisor, participates in the preparation and writing of teaching aids with the author and other co-authors.	
Recommended literature: Current sources on the presented issues.	
Languages necessary to complete the course: Slovak language, English language	
Notes: Teacher: supervisor	
Past grade distribution Total number of evaluated students: 0	
Lecturers:	
Last change: 18.04.2022	
Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.	

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/488-PhD/21	Course title: Completing Other Subject of the Offer of Other University Faculties
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning, distance learning	
Number of credits: 0	
Recommended semester: 1., 2., 3., 4..	
Educational level: III.	
Prerequisites:	
Course requirements: Upon presentation of confirmation of completion of the course at another faculty of the university, the doctoral student is evaluated according to the specific credit evaluation of the course at the faculty.	
Learning outcomes: The doctoral student will gain knowledge of the subject at another faculty of the university.	
Class syllabus: The doctoral student will complete a designated subject at another faculty of the university at which he / she did not complete his / her second degree.	
Recommended literature: Current sources on the presented issues	
Languages necessary to complete the course: Slovak language, English language	
Notes:	
Past grade distribution Total number of evaluated students: 0	
ABS	NEABS
0,0	0,0
Lecturers:	
Last change: 13.04.2022	
Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.	

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/451-PhD/21	Course title: Completing Prescribed Doctoral Lectures and Seminars 1
Educational activities: Type of activities: lecture / seminar Number of hours: per week: 1 / 2 per level/semester: 14 / 28 Form of the course: on-site learning, distance learning	
Number of credits: 10	
Recommended semester: 1.	
Educational level: III.	
Prerequisites:	
Course requirements: The doctoral student obtains the rating completed with a credit value after submitting a written version of the list of completed prescribed doctoral lectures and seminars, which thematically correspond to the topic of the dissertation and the subjects of the dissertation examination to the supervisor. The supervisor will give the evaluation to the doctoral student in the AIS and in the study report.	
Learning outcomes: Expansion and deepening of basic knowledge of doctoral students in scientific disciplines, which will be used in formulating hypotheses as a basis for the analytical part of the dissertation and in formulating conclusions for practice resulting from the results achieved.	
Class syllabus: The doctoral student completes the designated lectures and seminar teaching in the range of subjects approved by the guarantor of the study program, from the offer of subjects for doctoral study. The choice of subjects depends on the flexibility of learning trajectories and the achievement of learning outcomes. There are topics to choose from: <ul style="list-style-type: none"> - Analytical chemistry - Analytical monitoring of drug levels in practice - Inorganic chemistry - Applied biochemistry - Biochemistry - Pharmaceutical botany - Pharmaceutical chemistry - Pharmacognosy - Pharmacology - Pharmaceutical technology - Physical chemistry - Physiology - Immunology - Clinical pharmacy - Clinical pharmacology and pharmacotherapy 	

<ul style="list-style-type: none"> - Retail pharmacy and social pharmacy - Molecular biology - Molecular biology of plants - Current trends in preparations of natural origin - Organic chemistry - Pathological physiology - Biological drug technology - Toxicology - Public health and pharmaceutical care
<p>Recommended literature: Current sources on the presented issues.</p>
<p>Languages necessary to complete the course: Slovak language, English language</p>
<p>Notes:</p>
<p>Past grade distribution Total number of evaluated students: 0</p>
<p>Lecturers: doc. PharmDr. Szilvia Czigle, PhD., prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD., doc. PharmDr. Silvia Bittner Fialová, PhD., prof. Ing. Vladimír Frecer, DrSc., doc. Ing. Miroslav Habán, PhD., PharmDr. Katarína Maráková, PhD., prof. Ing. Milan Nagy, CSc., PharmDr. Juraj Piešťanský, PhD., doc. Mgr. Fils Andriamainty, PhD., PharmDr. Vladimír Garaj, PhD., Ing. Ladislav Habala, PhD., doc. PharmDr. Ivan Malík, PhD., doc. Ing. Martin Pisárčik, CSc., doc. PharmDr. Miroslava Sýkorová, PhD., doc. PharmDr. Marek Mátuš, PhD., PharmDr. Veronika Mikušová, PhD., doc. PharmDr. Daniela Mináriková, PhD., doc. PharmDr. Anna Paul Hrabovská, PhD., doc. PharmDr. Tomáš Tesař, PhD., MBA, RNDr. František Bilka, PhD., doc. Mgr. Andrea Bilková, PhD., Mgr. Gabriel Dóka, PhD., doc. Mgr. Martina Hrčka Dubníčková, PhD., doc. PharmDr. Peter Křenek, PhD., doc. PharmDr. Marek Obložinský, PhD., doc. PharmDr. Miloš Lukáč, PhD., RNDr. Alexander Búcsi, PhD., doc. RNDr. Jana Gallová, CSc., Mgr. Mária Klacsová, PhD., prof. RNDr. Daniela Uhríková, CSc., Dr.h.c. prof. RNDr. Jozef Čižmárik, PhD., prof. RNDr. Emil Havránek, PhD., Ing. Ľudmila Pašková, PhD., doc. RNDr. Miroslava Šupolíková, PhD., Mgr. Peter Vavrínek, PhD., PharmDr. Stanislava Kosírová, PhD., Mgr. Ondrej Sprušanský, PhD., Mgr. Diana Vavrincová, PhD., PharmDr. Eva Kráľová, PhD., PharmDr. Tomáš Rajtík, PhD.</p>
<p>Last change: 18.04.2022</p>
<p>Approved by: prof. PharmDr. Ján Klimas, PhD., MPH, prof. PharmDr. Adriana Duriš Adameová, PhD., prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.</p>

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/452-PhD/21	Course title: Completing Prescribed Doctoral Lectures and Seminars 2
Educational activities: Type of activities: lecture / seminar Number of hours: per week: 1 / 2 per level/semester: 14 / 28 Form of the course: on-site learning, distance learning	
Number of credits: 10	
Recommended semester: 2.	
Educational level: III.	
Prerequisites:	
Course requirements: The doctoral student obtains the rating completed with a credit value after submitting a written version of the list of completed prescribed doctoral lectures and seminars, which thematically correspond to the topic of the dissertation and the subjects of the dissertation examination to the supervisor. The supervisor will give the evaluation to the doctoral student in the AIS and in the study report.	
Learning outcomes: Expansion and deepening of basic knowledge of doctoral students in scientific disciplines, which will be used in formulating hypotheses as a basis for the analytical part of the dissertation and in formulating conclusions for practice resulting from the results achieved.	
Class syllabus: The doctoral student completes the designated lectures and seminar teaching in the range of subjects approved by the guarantor of the study program, from the offer of subjects for doctoral study. The choice of subjects depends on the flexibility of learning trajectories and the achievement of learning outcomes. There are topics to choose from: - Analytical chemistry - Analytical monitoring of drug levels in practice - Inorganic chemistry - Applied biochemistry - Biochemistry - Pharmaceutical botany - Pharmaceutical chemistry - Pharmacognosy - Pharmacology - Pharmaceutical technology - Physical chemistry - Physiology - Immunology - Clinical pharmacy - Clinical pharmacology and pharmacotherapy - Retail pharmacy and social pharmacy - Molecular biology - Molecular biology of plants - Current trends in preparations of natural origin - Organic chemistry - Pathological physiology - Biological drug technology - Toxicology - Public health and pharmaceutical care	
Recommended literature: Current sources on the presented issues.	
Languages necessary to complete the course: Slovak language, English language	
Notes:	
Past grade distribution Total number of evaluated students: 0	

Lecturers: RNDr. František Bilka, PhD., doc. Mgr. Andrea Bilková, PhD., doc. PharmDr. Marek Obložinský, PhD., Ing. Ludmila Pašková, PhD., doc. Mgr. Martina Hřčka Dubničková, PhD., prof. RNDr. Peter Mikuš, PhD., PharmDr. Juraj Piešťanský, PhD., PharmDr. Katarína Maráková, PhD., doc. PharmDr. Silvia Bittner Fialová, PhD., doc. PharmDr. Szilvia Czigle, PhD., RNDr. Peter Gál, PhD., doc. Ing. Miroslav Habán, PhD., prof. PharmDr. Pavel Mučaji, PhD., prof. Ing. Milan Nagy, CSc., doc. Mgr. Fils Andriamainty, PhD., doc. PharmDr. Miroslava Sýkorová, PhD., Dr.h.c. prof. RNDr. Jozef Čižmárik, PhD., Ing. Jaroslav Galba, PhD., PharmDr. Vladimír Garaj, PhD., doc. PharmDr. Ivan Malík, PhD., prof. RNDr. Daniela Uhríková, CSc., RNDr. Alexander Búcsi, PhD., doc. RNDr. Jana Gallová, CSc., Mgr. Mária Klacsová, PhD., Mgr. Norbert Kučerka, DrSc., Mgr. Ondrej Sprušanský, PhD., doc. PharmDr. Marek Mátuš, PhD., Mgr. Diana Vavrincová, PhD., Mgr. Peter Vavrinec, PhD., Mgr. Gabriel Dóka, PhD., doc. PharmDr. Anna Paul Hrabovská, PhD., prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, PharmDr. Tomáš Rajtík, PhD., PharmDr. Stanislava Kosírová, PhD., PharmDr. Eva Kráľová, PhD., doc. PharmDr. Peter Křenek, PhD., doc. RNDr. Miroslava Šupolíková, PhD., PharmDr. Veronika Mikušová, PhD., Ing. Ladislav Habala, PhD., doc. Ing. Martin Pisárčik, CSc., doc. PharmDr. Jindra Valentová, PhD., doc. PharmDr. Miloš Lukáč, PhD., doc. PharmDr. Daniela Mináriková, PhD., doc. PharmDr. Tomáš Tesař, PhD., MBA, prof. RNDr. Magdaléna Kuželová, CSc., prof. Ing. Vladimír Frecer, DrSc.

Last change: 18.04.2022

Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/453-PhD/21	Course title: Completing Selected Doctoral Lectures and Seminars
Educational activities: Type of activities: lecture / seminar Number of hours: per week: 1 / 2 per level/semester: 14 / 28 Form of the course: on-site learning, distance learning	
Number of credits: 10	
Recommended semester: 3.	
Educational level: III.	
Prerequisites:	
Course requirements: The doctoral student obtains the rating completed with a credit value after submitting a written version of the list of completed prescribed doctoral lectures and seminars, which thematically correspond to the topic of the dissertation and the subjects of the dissertation examination to the supervisor. The supervisor will give the evaluation to the doctoral student in the AIS and in the study report.	
Learning outcomes: Expansion and deepening of knowledge of doctoral students in scientific disciplines, which will be used in formulating hypotheses as a basis for the analytical part of the dissertation and in formulating conclusions for practice resulting from the results achieved.	
Class syllabus: The doctoral student completes the designated lectures and seminar teaching in the range of subjects approved by the guarantor of the study program, from the offer of subjects for doctoral study. The choice of subjects depends on the flexibility of learning trajectories and the achievement of learning outcomes. There are topics to choose from: <ul style="list-style-type: none"> - Analytical chemistry - Analytical monitoring of drug levels in practice - Inorganic chemistry - Applied biochemistry - Biochemistry - Pharmaceutical botany - Pharmaceutical chemistry - Pharmacognosy - Pharmacology - Pharmaceutical technology - Physical chemistry - Physiology - Immunology - Clinical pharmacy - Clinical pharmacology and pharmacotherapy 	

<ul style="list-style-type: none"> - Retail pharmacy and social pharmacy - Molecular biology - Molecular biology of plants - Current trends in preparations of natural origin - Organic chemistry - Pathological physiology - Biological drug technology - Toxicology - Public health and pharmaceutical care
<p>Recommended literature: Current sources on the presented issues.</p>
<p>Languages necessary to complete the course: Slovak language, English language</p>
<p>Notes:</p>
<p>Past grade distribution Total number of evaluated students: 0</p>
<p>Lecturers: RNDr. František Bilka, PhD., doc. Mgr. Andrea Bilková, PhD., doc. PharmDr. Marek Obložinský, PhD., Ing. Ludmila Pašková, PhD., doc. Mgr. Martina Hrčka Dubničková, PhD., prof. RNDr. Peter Mikuš, PhD., PharmDr. Juraj Piešťanský, PhD., prof. RNDr. Emil Havránek, PhD., PharmDr. Katarína Maráková, PhD., doc. PharmDr. Silvia Bittner Fialová, PhD., doc. PharmDr. Szilvia Czigle, PhD., RNDr. Peter Gál, PhD., doc. Ing. Miroslav Habán, PhD., prof. PharmDr. Pavel Mučaji, PhD., prof. Ing. Milan Nagy, CSc., Dr.h.c. prof. RNDr. Jozef Čížmárik, PhD., prof. Ing. Ferdinand Devínsky, DrSc., prof. RNDr. Magdaléna Kuželová, CSc., doc. Mgr. Fils Andriamainty, PhD., doc. PharmDr. Miroslava Sýkorová, PhD., Ing. Jaroslav Galba, PhD., PharmDr. Vladimír Garaj, PhD., doc. PharmDr. Ivan Malík, PhD., prof. RNDr. Daniela Uhríková, CSc., RNDr. Alexander Búcsi, PhD., doc. RNDr. Jana Gallová, CSc., Mgr. Mária Klacsová, PhD., Mgr. Norbert Kučerka, DrSc., Mgr. Ondrej Sprušanský, PhD., doc. PharmDr. Marek Máťuš, PhD., Mgr. Diana Vavrincová, PhD., Mgr. Peter Vavrinec, PhD., doc. PharmDr. Anna Paul Hrabovská, PhD., prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, PharmDr. Tomáš Rajtík, PhD., PharmDr. Stanislava Kosírová, PhD., doc. PharmDr. Peter Křenek, PhD., doc. RNDr. Miroslava Šupolíková, PhD., PharmDr. Veronika Mikušová, PhD., Ing. Ladislav Habala, PhD., doc. Ing. Martin Pisárčik, CSc., doc. PharmDr. Jindra Valentová, PhD., doc. PharmDr. Miloš Lukáč, PhD., doc. PharmDr. Daniela Mináriková, PhD., doc. PharmDr. Tomáš Tesař, PhD., MBA</p>
<p>Last change: 18.04.2022</p>
<p>Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.</p>

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/489-PhD/21	Course title: Completion of a Defined Stage of the PhD Scientific Program
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning, distance learning	
Number of credits: 5	
Recommended semester: 7., 8..	
Educational level: III.	
Prerequisites:	
Course requirements: The doctoral student obtains the rating completed with a credit value upon submission of all required outcomes achieved during the doctoral study.	
Learning outcomes: After evaluating the results achieved, the doctoral student demonstrates the supervisor's ability to perform scientific work, ie to create scientific texts that meet the criteria of expertise, scientific and methodological relevance and then present these texts to the audience at a scientific event and demonstrates the ability to cooperate with domestic and foreign scientific authorities.	
Class syllabus: After consulting with the supervisor, the doctoral student will present the achieved results of his / her study, which meet the criteria of professionalism, scientific knowledge and methodological relevance in the given field of study.	
Recommended literature:	
Languages necessary to complete the course: Slovak language, English language	
Notes: Teacher: supervisor	
Past grade distribution Total number of evaluated students: 0	
Lecturers:	
Last change: 18.04.2022	
Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.	

STATE EXAM DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/302-PhD/22	Course title: Dissertation Thesis and its Defence
Number of credits: 30	
Educational level: III.	
Recommended prerequisites: Defined in the individual study plan of the doctoral student and in the Study Regulations of FPHARM CU.	
Course requirements: The doctoral student will obtain the rating completed with credit value after successfully defending the dissertation thesis. Fulfillment of required conditions according to regulations and submission of dissertation thesis.	
Learning outcomes: after a successful defense he / she will obtain a title PhD.	
Class syllabus: 1) The doctoral student will prepare a dissertation thesis. Through the dissertation, the student demonstrates the ability and readiness for independent scientific and creative activity in the field of research or development or for independent theoretical and creative activity. It should be characterized by a high degree of analysis and synthesis of knowledge, as well as a sufficient overview of the existing literature. The work must be original, created by the author in compliance with the rules of working with information sources. The school work must not have the character of plagiarism, nor must it infringe the copyrights of other authors. The author is obliged to thoroughly cite the information sources used, to name the specific and specific research results of other authors or authors, by citing the relevant source, to accurately describe the methods and working procedures of other authors or collectors, to document laboratory results and field research of other authors or collectives. The citation technique is guided by the practice in the given scientific field, respecting the relevant standards and norms. 2) The doctoral student will briefly state the essential content of his / her dissertation, its concept, results and contribution in the defense of the dissertation. 3) The doctoral student will take a position on the opinions of the opponents, in particular he will comment on all objections and comments and answer their questions. 4) During the discussion, the doctoral student will answer all questions and take a stand on all suggestions and objections of its participants.	
State exam syllabus:	
Recommended literature: Current sources on the studied issues	
Languages necessary to complete the course: Slovak language, in case of the consent of the dean and the consent of the chairman of the committee of the doctoral study on the proposal of the doctoral student also in another world language, preferably English.	
Last change: 18.04.2022	
Approved by:	

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/456-PhD/21	Course title: Elaboration of a Manuscript of a Scientific Publication in a Foreign Language as the First Author
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning, distance learning	
Number of credits: 10	
Recommended semester: 5., 6..	
Educational level: III.	
Prerequisites:	
Course requirements: The doctoral student obtains the rating completed with a credit value after submitting the manuscript of the scientific work in a foreign language to the supervisor, which documents the ability to create a scientific text for publication in a journal with IF. The student is the first author in the manuscript	
Learning outcomes: a doctoral student under the guidance of a supervisor demonstrates the ability to work scientifically, i. e. a scientific text that meets the criteria of professionalism, scientific and methodological relevance.	
Class syllabus: 1. The doctoral student, after consultation with the supervisor, shall develop scientific texts in a foreign language (English language is recommended) that meet the criteria of professionalism, scientific and methodological relevance. 2. The scientific text of the manuscripts consists of the basic parts: - abstract - introduction - material and methods - results and discussion - literature. 3. The doctoral student respects the ethics of publishing, each scientific text is original.	
Recommended literature: Current sources on the presented issues.	
Languages necessary to complete the course: foreign language, English is recommended	
Notes: Lecturer: supervisor	
Past grade distribution Total number of evaluated students: 0	

Lecturers:
Last change: 18.04.2022
Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/432-PhD/21	Course title: English Language and Foreign Language Exam
Educational activities: Type of activities: seminar Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning, distance learning	
Number of credits: 10	
Recommended semester: 1.	
Educational level: III.	
Prerequisites:	
Course requirements: The doctoral student will receive an evaluation with a credit value after successfully passed the foreign language exam (min. 60%). A total of at least 91% points must be obtained to obtain an A rating, at least 81% points to obtain a B rating, at least 73% points for a C rating, at least 66% points for a D rating, and at least 60% for an E rating. Credits will not be awarded to students who earn less than 60% from a written exam (FX).	
Learning outcomes: The doctoral student will gain knowledge of academic language preparation in English at a terminological and grammatical level.	
Class syllabus: Demonstration of academic language competences at level B2 (according to the Common European Framework of Reference for Languages) in English in written and oral form. Academic texts and tasks are focused on pharmacy practice, the role of pharmacist in contact with patient, description of basic laboratory equipment, knowledge of terminology of vitamins and minerals, first aid, hereditary factors, addictions, theoretical aspects of pharmacology and drug therapy and complementary medicine.	
Recommended literature: English for Pharmacists I. – IV.	
Languages necessary to complete the course: English language	
Notes:	
Past grade distribution Total number of evaluated students: 0	
Lecturers: PhDr. Darina Kližanová, PaedDr. Viera Žufková, PhD.	
Last change: 03.04.2022	
Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.	

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/470-PhD/21	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: on-site learning, distance learning	
Number of credits: 2	
Recommended semester: 1., 2., 3., 4., 5., 6., 7., 8..	
Educational level: III.	
Prerequisites:	
Course requirements: The doctoral student obtains the rating completed with a credit value after submitting a written version thematically corresponding to the topic of the dissertation, research, theoretical introduction or project to the supervisor, the doctoral student obtains the evaluation completed with a credit value. The supervisor provides the evaluation to the doctoral student by making an entry into the AIS and in the study records.	
Learning outcomes: The doctoral student under the guidance of the supervisor will demonstrate the ability to develop a search, theoretical introduction or project that thematically corresponds to the topic of the dissertation.	
Class syllabus: 1. The doctoral student prepares a research, theoretical introduction or project corresponding to the main topic of the dissertation under the guidance of the supervisor 2. The doctoral student presents a case study corresponding to the main topic of the dissertation in the presence of the supervisor	
Recommended literature: Current sources on the studied issues.	
Languages necessary to complete the course: Slovak language, English language	
Notes:	
Past grade distribution Total number of evaluated students: 0	
Lecturers:	
Last change: 18.04.2022	
Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.	

STATE EXAM DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/501-PhD/11	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: J. Krätzmár-Šmogrovič a kol.: Všeobecná a anorganická chémia., Osveta Martin (2007). R. Chang: General Chemistry: The Essential Concepts, McGraw Hill; 7. vydanie (2013). C. Housecroft, A. Sharpe: Inorganic Chemistry, Pearson, 5. vydanie (2018). C. Altavilla, E. Ciliberto: Inorganic Nanoparticles. Synthesis, Applications, and Perspectives, CRC Press (2010).	
Languages necessary to complete the course: Slovak language, partly English for the study of literature	
Notes: Teachers: doc. Ing. Martin Pisárčik, CSc., Ing. Ladislav Habala, PhD.	
Last change: 03.04.2022	
Approved by:	

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/455-PhD/21	Course title: Introduction to Scientific Research
Educational activities: Type of activities: seminar Number of hours: per week: 1 per level/semester: 14 Form of the course: on-site learning, distance learning	
Number of credits: 4	
Recommended semester: 1., 2..	
Educational level: III.	
Prerequisites:	
Course requirements: - active participation in seminars – seminar work (40%) - final test (60%) To complete the course, the student must achieve at least 60%. A total of at least 91% points must be obtained to obtain an A rating, at least 81% points to obtain a B rating, at least 73% points for a C rating, at least 66% points for a D rating, and at least 60% for an E rating. Credits will not be awarded to students who earn less than 60% from a written exam (FX). Scale of assessment (preliminary/final): 40/60	
Learning outcomes: After completing the seminars, the students can formulate their ideas, search for arguments, and conduct scientific interviews. They will learn to deal with evidence, be creative, inform, analyse, and understand the meaning of scientific research.	
Class syllabus: The focus covers the following areas of scientific research and education: <ul style="list-style-type: none"> - University education - Doctoral studies and PhD degree. - Science, research and observation - Selection of a scientific problem - Scientific research and experience - Experiment and experimenter - The meaning of scientific research - Scientific problem and its solution - Objectives and methods of scientific research - From observation to experiment - Ethics in scientific work - Science, pharmacy and clinical monitoring 	
Recommended literature: Hulín I., Ostatníková D. et al. O vedeckom bádání v medicíne, Bratislava, AEPress 2014, p. 240. Bielík L. Methodology of Science an Introduction, Bratislava, Comenius University in Bratislava, 2019, p. 232.	

<p>Languages necessary to complete the course: Slovak language, English language</p>
<p>Notes:</p>
<p>Past grade distribution Total number of evaluated students: 0</p>
<p>Lecturers: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, doc. PharmDr. Miloš Lukáč, PhD., prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD., prof. RNDr. Daniela Uhríková, CSc.</p>
<p>Last change: 09.04.2022</p>
<p>Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.</p>

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/454-PhD/21	Course title: Introduction to Scientific Writing in English Language
Educational activities: Type of activities: seminar Number of hours: per week: 1 per level/semester: 14 Form of the course: on-site learning, distance learning	
Number of credits: 4	
Recommended semester: 2.	
Educational level: III.	
Prerequisites:	
Course requirements: - active participation in seminars - midterm test (15%) - final test (85%) To complete the course, the student must achieve at least 60%. A total of at least 91% points must be obtained to obtain an A rating, at least 81% points to obtain a B rating, at least 73% points for a C rating, at least 66% points for a D rating, and at least 60% for an E rating. Credits will not be awarded to students who earn less than 60% from a written exam (FX). Scale of assessment (preliminary/final): 15/85	
Learning outcomes: After completing the seminars, the students can formulate their ideas, search for arguments, and conduct scientific interviews through academic writing. They will learn to deal with evidence, be creative, inform, analyse, use professional terminology if necessary.	
Class syllabus: The seminars follow the deepening of communicative skills and the acquisition of specific terminology. In addition to selected texts from textbooks, texts from promotional materials, manuals and magazines are used. The following topics are covered: writing professional articles, reports, interviews, lectures, emails, creating abstracts and summaries, presentations on assigned topics.	
Recommended literature: Rejharová, V.: Letter – Writer. Praha: Academia, 1972, Bates, M., Dudley, T.: Nucleus: General Science. London: Longman, 1992, Havlíčková, I., Dostálová, Š., Katerová, Z.: English for Pharmacy and Medical Bioanalytics. Karolinum Press, 2014, James, V. D.: Medicine. London: Prentice Hall, 1989	
Languages necessary to complete the course: English language	
Notes:	
Past grade distribution Total number of evaluated students: 0	
Lecturers: PaedDr. Viera Žufková, PhD.	

Last change: 03.04.2022

Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/483-PhD/21	Course title: Management of Student Scientific Activities
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning, distance learning	
Number of credits: 5	
Recommended semester: 1., 2., 3., 4., 5., 6., 7., 8..	
Educational level: III.	
Prerequisites:	
Course requirements: The course is successfully completed upon presentation of a certificate of management of student scientific activities. The confirmation will be issued by the supervisor.	
Learning outcomes: the doctoral student will gain experience and acquire the skills necessary for the presentation of scientific work on selected professional issues in the academic space at the 1st and 2nd level of university study in the field.	
Class syllabus: 1. The doctoral student prepares the assignment, during the whole supervision of the work the doctoral student is responsible for the administration of all requisites related to this type of activity. 2. The doctoral student methodically and professionally guides the student from the choice of topic to the successful presentation of results. 3. The doctoral student will prepare a certificate of conducting the student's scientific work, which can be confirmed by the head of the department. The abstract of the presentation must be attached to the confirmation and the confirmation signed by the head of the department serves as proof of successful completion of the conditions for the supervisor, who on the basis of it will award an rating (completed).	
Recommended literature: Current sources on the presented issues.	
Languages necessary to complete the course: Slovak language, English language	
Notes: Teacher: supervisor	
Past grade distribution Total number of evaluated students: 0	
Lecturers:	
Last change: 18.04.2022	

Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/473-PhD/21	Course title: Obtaining the "Grant FaF UK for Young Scientists" (Principal Investigator)
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning, distance learning	
Number of credits: 15	
Recommended semester: 1., 2., 3., 4., 5., 6., 7., 8..	
Educational level: III.	
Prerequisites:	
Course requirements: The doctoral student obtains the rating completed with a credit value after submitting the acquisition of the grant.	
Learning outcomes: the doctoral student under the guidance of the supervisor demonstrated the ability to create, implement and administer a scientific project for young people.	
Class syllabus: 1. The doctoral student, after consultation with the supervisor, will develop and submit a research project registered by the Faculty of Pharmacy Comenius University Bratislava. In the submitted author's project, the doctoral student appears as a principal investigator. 2. The doctoral student is obliged to inform the head of the department about the submitted project. 3. The doctoral student respects and complies with the currently valid Directive on the approval, registration and archiving of grant projects at Faculty of Pharmacy Comenius University Bratislava.	
Recommended literature: Current sources on the presented issues.	
Languages necessary to complete the course: Slovak language	
Notes: Teacher: supervisor	
Past grade distribution Total number of evaluated students: 0	
Lecturers:	
Last change: 18.04.2022	
Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.	

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/474-PhD/22	Course title: Obtaining the "Grant FaF UK for Young Scientists" (Co-investigator of Grant)
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning, distance learning	
Number of credits: 10	
Recommended semester: 1., 2., 3., 4., 5., 6., 7., 8..	
Educational level: III.	
Prerequisites:	
Course requirements: The doctoral student obtains the rating completed with a credit value after submitting the acquisition of the grant.	
Learning outcomes: the doctoral student under the guidance of the supervisor demonstrated the ability to participate in the creation, implementation and administration of a scientific project for young people.	
Class syllabus: 1. The doctoral student, after consultation with the supervisor, co-authored in the elaboration and submission of a scientific project registered at Faculty of Pharmacy Comenius University Bratislava. The doctoral student appears as a co-investigator in the submitted author's project. 2. The doctoral student is obliged to inform the head of the department about the submitted project. 3. The doctoral student respects and complies with the currently valid Directive on the approval, registration and archiving of grant projects at Faculty of Pharmacy Comenius University Bratislava.	
Recommended literature: Current sources on the presented issues.	
Languages necessary to complete the course: Slovak language	
Notes: Teacher: supervisor	
Past grade distribution Total number of evaluated students: 0	
Lecturers:	
Last change: 18.04.2022	
Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.	

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/472-PhD/21	Course title: Obtaining the "University Grant for Young Researchers" (Co-investigator of Grant)
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning, distance learning	
Number of credits: 10	
Recommended semester: 1., 2., 3., 4., 5., 6., 7., 8..	
Educational level: III.	
Prerequisites:	
Course requirements: The doctoral student obtains the rating completed with a credit value after submitting the acquisition of the grant.	
Learning outcomes: the doctoral student under the guidance of the supervisor demonstrated the ability to participate in the creation, implementation and administration of a scientific project for young people.	
Class syllabus: 1. The doctoral student, after consultation with the supervisor, co-authored in the elaboration and submission of a scientific project registered at Comenius University Bratislava. The doctoral student appears as a co-investigator in the submitted author's project. 2. The doctoral student is obliged to inform the head of the department about the submitted project. 3. The doctoral student respects and complies with the currently valid Directive on the approval, registration and archiving of grant projects at Comenius University Bratislava.	
Recommended literature: Current sources on the presented issues.	
Languages necessary to complete the course: Slovak language	
Notes: Teacher: supervisor	
Past grade distribution Total number of evaluated students: 0	
Lecturers:	
Last change: 18.04.2022	
Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.	

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/471-PhD/21	Course title: Obtaining the "University Grant for Young Researchers" (Principal Investigator)
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning, distance learning	
Number of credits: 20	
Recommended semester: 1., 2., 3., 4., 5., 6., 7., 8..	
Educational level: III.	
Prerequisites:	
Course requirements: The doctoral student obtains the rating completed with a credit value after submitting the acquisition of the grant.	
Learning outcomes: the doctoral student under the guidance of the supervisor demonstrated the ability to create, implement and administer a scientific project for young people.	
Class syllabus: 1. The doctoral student, after consultation with the supervisor, will develop and submit a research project registered by the Comenius University Bratislava. In the submitted author's project, the doctoral student appears as a principal investigator. 2. The doctoral student is obliged to inform the head of the department about the submitted project. 3. The doctoral student respects and complies with the currently valid Directive on the approval, registration and archiving of grant projects at Comenius University Bratislava.	
Recommended literature: Current sources on the presented issues.	
Languages necessary to complete the course: Slovak language	
Notes: Teacher: supervisor	
Past grade distribution Total number of evaluated students: 0	
Lecturers:	
Last change: 18.04.2022	
Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.	

STATE EXAM DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/502-PhD/11	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: 1. Devínsky, F., Ďurinda, J., Lacko, I., Valentová J.: Organická chémia pre farmaceutov. Martin : Osveta, 2013. 805 s. (učebnica); 2. Favre a, Powell, H.: Nomenclature of Organic Chemistry, Royal Society of Chemistry, 2014,1068 s. , Lukáč M., Devínsky F.: Organická syntéza. Laboratórny manuál.. Bratislava, UK, 2015. 144 s.	
Languages necessary to complete the course: Slovak language	
Notes: Lecturers: doc. PharmDr. Miloš Lukáč, PhD., doc. PharmDr. Jindra Valentová, PhD.	
Last change: 10.04.2022	
Approved by:	

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/476-PhD/21	Course title: Other Activities (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: on-site learning, distance learning	
Number of credits: 3	
Recommended semester: 1., 2., 3., 4., 5., 6., 7., 8..	
Educational level: III.	
Prerequisites:	
Course requirements: The doctoral student obtains the rating completed with credit value after submitting an invitation to the conference (in which he is a member of the scientific conference organizing committee) and a separate published article on the successful implementation of the conference or a copy of the published summary of papers at the scientific event in the form of proceedings. source cover, circulation letters with ISBN or ISSN, source content, contribution).	
Learning outcomes: the doctoral student under the guidance of the supervisor will demonstrate the ability to prepare, organize and conduct a scientific conference.	
Class syllabus: 1. The doctoral student shall actively participate in the preparation, organization and implementation of the conference in the position of chairman or member of the organizing committee of the scientific conference. 2. After the successful implementation of the conference, the doctoral student will prepare an article with photo documentation, which presents and promotes a scientific event in a journalistic, scientific periodical or proceedings.	
Recommended literature: Current sources on the presented issues.	
Languages necessary to complete the course: Slovak language, English language	
Notes: Teacher: supervisor	
Past grade distribution Total number of evaluated students: 0	
Lecturers:	
Last change: 18.04.2022	

Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/475-PhD/22	Course title: Participation in the Implementation of Another Research Project
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning, distance learning	
Number of credits: 3	
Recommended semester: 1., 2., 3., 4., 5., 6., 7., 8..	
Educational level: III.	
Prerequisites:	
Course requirements: The doctoral student obtains the rating completed with a credit value after submitting the participation in the grant.	
Learning outcomes: the doctoral student under the guidance of the supervisor has demonstrated the ability to create, implement and administer a scientific project.	
Class syllabus: 1. The doctoral student, after consultation with the supervisor, collaborates as an author on the elaboration and submission of a scientific project registered by the Ministry of Education, Science, Research and Sport of the Slovak Republic. The doctoral student appears as a co-investigator in the submitted author's project. 2. The doctoral student has the obligation to inform the head of the department about the solution of partial tasks on the project. 3. The doctoral student respects and complies with the currently valid Directive on the approval, registration and archiving of grant projects at Comenius University Bratislava.	
Recommended literature: Current sources on the presented issues.	
Languages necessary to complete the course: Slovak language	
Notes: Teacher: supervisor	
Past grade distribution Total number of evaluated students: 0	
Lecturers:	
Last change: 18.04.2022	
Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.	

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/482-PhD/21	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: on-site learning, distance learning	
Number of credits: 5	
Recommended semester: 1., 2., 3., 4., 5., 6., 7., 8..	
Educational level: III.	
Prerequisites:	
Course requirements: The course is successfully completed if the trained student in AIS-2 is enrolled in the evaluation of the course: Preparation of Diploma Thesis 1 or Preparation of Diploma Thesis 2 or Preparation of Diploma Thesis 3.	
Learning outcomes: The doctoral student will gain experience and acquire the skills necessary for leading the final work of a selected professional issue in the academic space at the 2nd level of university study within the field of study.	
Class syllabus: 1. The doctoral student methodically and professionally guides the undergraduate student from the choice of topic to the successful defense of the final (diploma) thesis under the supervision of the thesis supervisor. 2. During the entire supervision of the final (diploma) thesis, the doctoral student is responsible for the administration of all requisites related to the final (diploma) thesis in AIS under the supervision of the thesis supervisor. 3. The doctoral student will prepare a certificate of completion of the final (diploma) thesis, which can be confirmed by the head of the department. The evaluation must be accompanied by evaluation assessments of the works. The confirmation signed by the head of the department serves as proof of successful fulfillment of the conditions for completing the course for the supervisor, who consequently will award the evaluation (graduated) to the doctoral student in AIS and in the study report.	
Recommended literature: Current sources on the studied issues.	
Languages necessary to complete the course: Slovak language, English language	
Notes: Teacher: supervisor	
Past grade distribution Total number of evaluated students: 0	
Lecturers:	

Last change: 13.04.2022

Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.

STATE EXAM DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/431-PhD/21	Course title: Passing the Dissertation Exam
Number of credits: 20	
Educational level: III.	
Recommended prerequisites: Defined in the individual study plan of the doctoral student and in the Study Regulations of FPHARM CU.	
Course requirements: The doctoral student will obtain the rating completed with credit value after successfully passing the dissertation exam with the result passed	
Learning outcomes: At the dissertation exam, the student must demonstrate not only knowledge of the specified subjects of the exam, but also the ability under the supervision of the supervisor to submit a dissertation project proposal, method of solving experimental procedures, ability to form conclusions based on results and defend their project proposal before a committee of the doctoral study.	
Class syllabus: 1) The dissertation examination consists of a part consisting of a discussion of the written work for the dissertation examination - project proposal. 2) The dissertation examination consists of a part in which the doctoral student has to demonstrate theoretical knowledge in the specified subjects of the dissertation examination. 3) The subjects of the dissertation examination consist of the main subject and secondary subjects according to the characteristics of the study program of the doctoral degree in the field of study.	
State exam syllabus:	
Recommended literature: Current sources on the studied issues	
Languages necessary to complete the course: Slovak language, in case of the consent of the dean and the consent of the chairman of the committee of the doctoral study on the proposal of the doctoral student also in another world language, preferably English.	
Last change: 18.04.2022	
Approved by:	

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/485-PhD/21	Course title: Pedagogical Activities - Seminars
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning, distance learning	
Number of credits: 7	
Recommended semester: 1., 2., 3., 4., 5., 6., 7., 8..	
Educational level: III.	
Prerequisites:	
Course requirements: After submitting a certificate of completion of pedagogical activities, the doctoral student obtains the rating completed according to the specific credit evaluation of the subject.	
Learning outcomes: the doctoral student will gain experience and acquire the skills necessary for the presentation of selected professional issues in the academic space at the 1st or 2nd level of university studies within the field.	
Class syllabus: 1. The doctoral student prepares seminars, provides teaching and assessment at the end of the semester. 2. The doctoral student is responsible for the administration of pedagogical outputs in the AIS system. 3. In his / her pedagogical activities, the doctoral student respects and adheres to the valid guidelines applicable to all teachers of FPHARM CU Bratislava in the current academic year. 4. The full-time doctoral student implements pedagogical activities in full-time study to the extent specified by the implementing regulations of FPHARM CU Bratislava for doctoral studies, but if the course is also implemented in external form, the full-time doctoral student will ensure its implementation free of charge. 5. A doctoral student of an external form of study may carry out pedagogical activities without the right to a fee, while the form and scope of this activity shall be agreed with the management of FPHARM CU Bratislava. 6. The doctoral student will prepare a confirmation of the implementation of pedagogical activities. The confirmation signed by the head of the department where the pedagogical activity took place serves as proof of successful fulfillment of the conditions for completing the course for the supervisor, who on the basis of it will award (graduate) the doctoral student to AIS and to the study report.	
Recommended literature: Current resources on the topic of pedagogical activities.	
Languages necessary to complete the course:	

Slovak language, English language
Notes: Teacher: supervisor
Past grade distribution Total number of evaluated students: 0
Lecturers:
Last change: 18.04.2022
Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/484-PhD/21	Course title: Pedagogical Activities - Exercises
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning, distance learning	
Number of credits: 5	
Recommended semester: 1., 2., 3., 4., 5., 6., 7., 8..	
Educational level: III.	
Prerequisites:	
Course requirements: After submitting a certificate of completion of pedagogical activities, the doctoral student obtains the rating completed according to the specific credit evaluation of the subject.	
Learning outcomes: the doctoral student will gain experience and acquire the skills necessary for the presentation of selected professional issues in the academic space at the 1st or 2nd level of university studies within the field.	
Class syllabus: 1. The doctoral student prepares exercises, provides teaching and evaluation at the end of the semester. 2. The doctoral student is responsible for the administration of pedagogical outputs in the AIS system. 3. In his / her pedagogical activities, the doctoral student respects and adheres to the valid guidelines applicable to all teachers of FPHARM CU Bratislava in the current academic year. 4. The full-time doctoral student implements pedagogical activities in full-time study to the extent specified by the implementing regulations of FPHARM CU Bratislava for doctoral studies, but if the course is also implemented in external form, the full-time doctoral student will ensure its implementation free of charge. 5. A doctoral student of an external form of study may carry out pedagogical activities without the right to a fee, while the form and scope of this activity shall be agreed with the management of FPHARM CU Bratislava. 6. The doctoral student will prepare a confirmation of the implementation of pedagogical activities. The confirmation signed by the head of the department where the pedagogical activity took place serves as proof of successful fulfillment of the conditions for completing the course for the supervisor, who on the basis of it will award (graduate) the doctoral student to AIS and to the study report.	
Recommended literature: Current resources on the topic of pedagogical activities.	
Languages necessary to complete the course:	

Slovak language, English language
Notes: Teacher: supervisor
Past grade distribution Total number of evaluated students: 0
Lecturers:
Last change: 18.04.2022
Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.

STATE EXAM DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/500-PhD/11	Course title: Pharmaceutical Chemistry
Number of credits: 0	
Educational level: III.	
Course requirements: Successful passing of the exam	
Learning outcomes: Expansion and intensification of knowledge from pharmaceutical chemistry that 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: Pharmaceutical/Medicinal Chemistry is a science unto itself, a central science positioned to provide a molecular bridge between basic science of biology and clinical science of medicine (analogous to chemistry being the (central) science between traditional disciplines of biology and physics). From a very broad perspective, a drug design may be divided into two phases fundamental concepts about: a) drugs, receptors, and drug–receptor interactions; b) drug–receptor interactions applied to human disease. Pharmaceutical/Medicinal Chemistry is interdisciplinary, drawing very suitably on Theoretical Chemistry, Organic Chemistry, Analytical Chemistry, Molecular Biology, Pharmacology, and Biochemistry. Despite these complexities, Pharmaceutical/Medicinal Chemistry has its own clear line – the design and discovery of drug molecules with a comprehensive and precise definition and characterization of their properties, taking into account i) structural integrity of the drug molecules (in pharmaceutical, pharmacokinetic and pharmacodynamic phase, respectively), ii) their structural fragments (pharmacophore, toxicophore, metabophore, biophore, etc.; interchangeable bioisosteres), iii) structural properties, iv) physicochemical features (solubility, surface activity, acid-base and lipohydrophilic properties, stability), v) shape properties (geometric, conformational, topological, steric), vi) stereochemical properties (optical isomers, enantiomers, geometric isomers), estimation of binding affinities (in vitro ligand binding assays) and impact of the drugs - enantiomers and isomers to relevant biological targets), vii) electronic properties. Following that knowledge, structure–biological activity relationships and/or structure-pharmacokinetics relationships and/or structure-toxicity relationships are comprehensively investigated (SAR, STR, QSAR).	
State exam syllabus:	
Recommended literature: Chackalamannil, S., Rotella, D., & Ward, S. (2017). <i>Comprehensive Medicinal Chemistry III</i> , 3. Vyd. Elsevier, Amsterdam, Holandsko, 4536 s. Patrick, G.L. (2017). <i>An Introduction to Medicinal Chemistry</i> . 6. Vyd. Oxford University Press, New York, USA, 832 s. Remko, M. (2019). <i>Základy medicínskej a farmaceutickej chémie</i> , 3. Vyd. Remedika, Bratislava, SR, 480 s. Roche, V.F., Zito, S.V., Lemke, T.L., & Williams, D.A. (2019). <i>Foye's Principles of Medicinal Chemistry</i> , 8. Vyd. Wolters Kluwer Health Adis (ESP), Baltimore, USA, 1168 s.	

<p>Silverman, R.B., & Holladay, M.W. (2015). The Organic Chemistry of Drug Design and Drug Action. 3. Vyd. Elsevier, Waltham, USA, 521 s.</p> <p>Wermuth, C., Aldous, D., Raboisson, P., & Rognan, D. (2015). The Practice of Medicinal Chemistry. 4. Vyd. Academic Press (Elsevier), San Diego, CA, USA; Kidlington, Oxford, Veľká Británia, 903 s</p>
<p>Languages necessary to complete the course: Slovak language</p>
<p>Notes: Lecturers: prof. RNDr. Peter Mikuš, PhD, prof. Ing. Vladimír Frečer, DrSc., doc. PharmDr. Ivan Malík, PhD., doc. Mgr. Fils Andriamainty, PhD., Dr.h.c. prof. RNDr. Jozef Čižmárik, PhD., doc. PharmDr. Miroslava Sýkorová, PhD., PharmDr. Vladimír Garaj, PhD.</p>
<p>Last change: 11.04.2022</p>
<p>Approved by:</p>

STATE EXAM DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/812-PhD/21	Course title: Pharmaceutical Technology
Number of credits: 0	
Educational level: III.	
Course requirements: Successful passing of the exam	
Learning outcomes: By passing the course, the PhD. student will have a complex theoretical knowledge of drugs as dispersion and application systems in terms of theoretical and practical preparation of innovative dosage forms.	
Class syllabus: Pharmaceutical preparations are of a dosage (application) form which depends on the means of administration and coexistence of relevant drugs and excipients. Pharmaceutical technology (galenics) deals with composition, formulation, production, evaluation, and quality assurance of individually prepared and manufactured pharmaceutical preparations. It studies conditions for formulation of drugs and excipients into pharm. preparations, rules governing these processes, relations of the preparation with the effect of contained drugs. The subject of the study are these areas: - Pharm. preparations as systems composed of drugs and excipients (constitutive, stabilizing, corrective, etc.), conditions for coexistence of components in pharm. preparation. - Procedures and devices for preparation and manufacturing of pharm. preparations - Evaluation and quality assurance of pharm. preparations in terms of composition, technology, structure - Relations between the pharm. preparation and bioavailability of administered drugs - Stability of pharm. preparations and its possible ensuring - Containers 'materials, technique for pharm. preparations 'containers, study of interactions between containers and drugs / excipients Current research is oriented to drug carriers (polymeric, lipid - liposomes) in the role of drug delivery systems as nanoparticles. It begins with the synthesis of the carrier, incorporation of the drug, continues with formulation of dosage form, stability studies of formulated particles and in vitro drug release study. At the end of this difficult process the biologic activity and in vivo bioavailability are evaluated in cooperation with other departments/institutions. Also, nanodispersion systems as e.g., micro- and nanoemulsions are studied, especially related to low soluble drugs (e.g., terbinafine, minoxidil, indomethacin, tretinoin) intended for topical application with local or systemic effect e.g., also using the mechanisms of transdermal passage. In the preparation of these systems, various types of polymers (e.g., chitosan, thermosensitive polymers) and specific excipients are used to create a specific structure of given formulation with improved properties (e.g., better bioadhesion, stability, capacity to release the low soluble drugs, improved permeation, and penetration to target tissues in required concentration).	
State exam syllabus:	
Recommended literature: Chalabala, M. a kol.: Technologie léků. 3. vyd. Praha: Galén, 2006. 399 s. Žabka, M. a kol.: Moderné lieky vo farmaceutickej technológii. Bratislava: SAP, 1999. s.487 European Pharmacopoeia 10 th Ed. Strasbourg: EDQM, 2022 Aulton, M. E.: Aulton's Pharmaceutics: the design and manufacture of medicines - Edinburgh: Churchill Livingstone, 2018 Mikušová, V.;	

Mikuš, P.: Advances in Chitosan-Based Nanoparticles for Drug Delivery. Int. J. Mol. Sci. 2021, 22, 9652. <https://doi.org/10.3390/ijms22179652>

Languages necessary to complete the course:

Slovak language, English language

Notes:

Lecturers: PharmDr. Veronika Mikušová, PhD., PharmDr. Juraj Piešťanský, PhD., doc. RNDr. Miroslava Šuplíková, PhD.

Last change: 11.04.2022

Approved by:

STATE EXAM DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/800-PhD/11	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 that 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: <ul style="list-style-type: none"> - pharmacodynamics with respect to the mechanism of action of drugs - pharmacokinetics - pharmacogenomics - adverse effects of drugs - drug overdose - therapeutic use of drugs Special pharmacology <ul style="list-style-type: none"> - 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:

Slovak language, 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 Mátuš, PhD.; Mgr. Peter Vavrinec, PhD.; Mgr. Diana Vavrincová, PhD

Last change: 11.04.2022

Approved by:

STATE EXAM DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/505-PhD/11	Course title: Physical Chemistry
Number of credits: 0	
Educational level: III.	
Course requirements: final exam	
<p>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.</p>	
<p>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.</p>	
State exam syllabus:	
<p>Recommended literature: Atkins, P. W.: Fyzikálna chémia: časť 1, 2a, 2b, 3. Bratislava: STU 1999. W.J. Moore: Fyzikální chemie, SNTL, Praha 1981 Cevc G.: Phospholipids handbook. Marcel Dekker, Inc. New York (1993) Mouritsen O.G.: Life – as a matter of fat. The emerging science of lipodomics. Springer – Verlag Berlin Heidelberg (2005) Kováč Š, Leško J.: Spektrálne metódy v organickej chémii, Bratislava, Alfa, 1980 Serdyuk I.N., Zaccai N.R., Zaccai J.: Methods in Molecular Biophysics. Structure, Dynamics, Function. Cambridge University Press, 2007</p>	
Languages necessary to complete the course: Slovak 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.

Last change: 11.04.2022

Approved by:

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/479-PhD/21	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: on-site learning, distance learning	
Number of credits: 5	
Recommended semester: 1., 2., 3., 4., 5., 6., 7., 8..	
Educational level: III.	
Prerequisites:	
Course requirements: The doctoral student obtains the rating with a credit value after submitting the program of scientific events (in which he appears as an active participant) to the supervisor, which is also evidenced by confirmations of the organizers of scientific events about active performance	
Learning outcomes: the doctoral student under the guidance of the supervisor has demonstrated the ability to work scientifically, ie to create scientific texts that meet the criteria of expertise, scientific and methodological relevance and then present these texts to the audience at a scientific event (presentation at the event is limited by age).	
Class syllabus: 1. The doctoral student, after consultation with the supervisor, shall develop scientific texts that meet the criteria of professionalism, scientific and methodological relevance. expertise, scientific and methodological relevance. 2. The doctoral student will individually ensure participation in a scientific event for young researchers (conference, scientific seminar, congress), at which he / she will actively present the results of his / her own scientific activity. 3. The doctoral student respects the ethics of publishing, each scientific text is original and the doctoral student presents it only once, while the translation of the content of the original scientific text is not considered as another original scientific text and it is inadmissible for the doctoral student to present it repeatedly.	
Recommended literature: Current sources on the presented issues.	
Languages necessary to complete the course: Slovak language, English language	
Notes: Teacher: supervisor	
Past grade distribution Total number of evaluated students: 0	

Lecturers:
Last change: 18.04.2022
Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/465-PhD/21	Course title: Professional Publication in International or Domestic Journal
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning, distance learning	
Number of credits: 4	
Recommended semester: 1., 2., 3., 4., 5., 6., 7., 8..	
Educational level: III.	
Prerequisites:	
Course requirements: The doctoral student obtains the rating completed with a credit value after submitting separate (source cover, circulation letters with ISBN or ISSN, source content, paper) published texts to the supervisor.	
Learning outcomes: the doctoral student, under the guidance of the supervisor, demonstrates the ability to work scientifically, i. e. to create a scientific text that meets the criteria of professionalism, scientific and methodological relevance.	
Class syllabus: 1. The doctoral student, after consultation with the supervisor, shall develop scientific texts that meet the criteria of professionalism, scientific and methodological relevance. 2. The doctoral student will individually ensure the publication of the given texts in a international or domestic professional peer-reviewed periodical. 3. The doctoral student respects the ethics of publishing, each scientific text is original and the doctoral student publishes it only once, while the translation of the content of the original text is not considered as another original scientific text.	
Recommended literature: Current sources on published issues.	
Languages necessary to complete the course: Slovak language, English language	
Notes: Teacher: supervisor	
Past grade distribution Total number of evaluated students: 0	
Lecturers:	
Last change: 18.04.2022	

Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/466-PhD/21	Course title: Published Abstract in English from a Scientific Event
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning, distance learning	
Number of credits: 3	
Recommended semester: 1., 2., 3., 4., 5., 6., 7., 8..	
Educational level: III.	
Prerequisites:	
Course requirements: The doctoral student obtains the rating completed with a credit value after submitting an abstract in English from a scientific event	
Learning outcomes: the doctoral student under the supervision of a supervisor has demonstrated the ability to work scientifically, ie to create scientific texts in English that meet the criteria of expertise, scientific and methodological relevance and then publish these texts as an abstract in a book of abstracts from a scientific event (conference, scientific seminar, congress).	
Class syllabus: 1. The doctoral student, in consultation with the supervisor, shall prepare scientific texts in English that meet the criteria of professionalism, scientific and methodological relevance. 2. The doctoral student will individually ensure the sending of the scientific text to the organizers of the scientific event (conference, scientific seminar, congress), at which he / she will actively present the results of his / her own scientific activity. 3. The doctoral student respects the ethics of publishing, each scientific text is original and the doctoral student presents it only once, while the translation of the content of the original scientific text is not considered another original scientific text and it is inadmissible for the doctoral student to present it repeatedly to be.	
Recommended literature: Current sources on the presented issues.	
Languages necessary to complete the course: English	
Notes: Teacher: provided by the supervisor Recommended Study Semester: full length of study	
Past grade distribution Total number of evaluated students: 0	
Lecturers:	

Last change: 18.04.2022

Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/487-PhD/21	Course title: Reviewing a Bachelor Thesis
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning, distance learning	
Number of credits: 5	
Recommended semester: 1., 2., 3., 4., 5., 6., 7., 8..	
Educational level: III.	
Prerequisites:	
Course requirements: The course is successfully completed if the doctoral student submits relevant evidence of the peer review of the bachelor thesis, and the confirmation of entering the review into the AIS-2.	
Learning outcomes: The doctoral student, under the guidance of a supervisor, has demonstrated the ability to review a professional text.	
Class syllabus: 1. The doctoral student will critically evaluate the professionalism of the text of the bachelor thesis. 2. The doctoral student, after consultation with the supervisor, will prepare a report for the bachelor's thesis. 3. The doctoral student enters the bachelor's thesis report into AIS-2.	
Recommended literature: Current sources on the presented issues.	
Languages necessary to complete the course: Slovak language, English language	
Notes: Lecturer: supervisor	
Past grade distribution Total number of evaluated students: 0	
Lecturers:	
Last change: 13.04.2022	
Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.	

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/467-PhD/21	Course title: Reviewing the Manuscript of an Article Submitted to an Indexed Scientific Journal (Scopus, Wos)
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning, distance learning	
Number of credits: 5	
Recommended semester: 1., 2., 3., 4., 5., 6., 7., 8..	
Educational level: III.	
Prerequisites:	
Course requirements: The course is successfully completed if the doctoral student submits relevant evidence of elaboration of the review on the manuscript of the article (e-mail or other confirmation from the editors).	
Learning outcomes: The doctoral student, under the guidance of a supervisor, has demonstrated the ability to review a professional text.	
Class syllabus: 1. The doctoral student will critically evaluate the professionalism of the manuscript. 2. The doctoral student, after consultation with the supervisor, will prepare a review of manuscript. 3. The doctoral student will submit the review to the redaction of the journal.	
Recommended literature: Current sources on the presented issues.	
Languages necessary to complete the course: Slovak language, English language	
Notes: Lecturer: supervisor	
Past grade distribution Total number of evaluated students: 0	
Lecturers:	
Last change: 10.04.2022	
Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.	

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/486-PhD/21	Course title: Supervision of the Final Bachelor's Thesis
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning, distance learning	
Number of credits: 5	
Recommended semester: 1., 2., 3., 4., 5., 6., 7., 8..	
Educational level: III.	
Prerequisites:	
Course requirements: The course is successfully completed if a bachelor's program participant is in AIS-2 is provided with the subject: Preparation of bachelor thesis 1 or Preparation of bachelor thesis 2.	
Learning outcomes: The doctoral student will gain experience and acquire the skills necessary for leading the final work of a selected professional topic in the academic space at the 1st level of university study within the field of study.	
Class syllabus: 1. The doctoral student will prepare in the AIS system, in the section Study records (VSES 057), the assignment of the final (bachelor's) thesis by entering the thesis title and annotation. During the entire supervision of the final (bachelor's) thesis, the doctoral student is responsible for the administration of all requisites related to the final (bachelor's) thesis in AIS. 2. The doctoral student methodically and professionally guides the bachelor's program student from the choice of topic to the successful defense of the final (bachelor's) thesis. 3. The doctoral student will prepare an evaluation of the final (bachelor's) thesis in the AIS, as well as in the form according to the instructions of the head of the corresponding department. 4. The doctoral student will prepare a certificate of completion of the final (bachelor's) thesis, which will be given to the head of the department. The evaluation must be accompanied by evaluation assessments of the works. The confirmation signed by the head of the department serves as proof of successful fulfillment of the conditions for completing the course for the supervisor who, based on the evaluation, provides the doctoral student with the grade "absolved" by entering it into AIS-2 and in the study record.	
Recommended literature: Current sources on the studied issues.	
Languages necessary to complete the course: Slovak language, English language	
Notes: Teacher: supervisor	

Past grade distribution Total number of evaluated students: 0
Lecturers:
Last change: 13.04.2022
Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/460-PhD/21	Course title: The Original Publication in Current Contents Journal
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning, distance learning	
Number of credits: 35	
Recommended semester: 1., 2., 3., 4., 5., 6., 7., 8..	
Educational level: III.	
Prerequisites:	
Course requirements: The doctoral student obtains the rating completed with a credit value after submitting separate (source cover, circulation letters with ISBN or ISSN, source content, paper) published texts to the supervisor.	
Learning outcomes: a doctoral student under the guidance of a supervisor demonstrates the ability to work scientifically, i. e. a scientific text that meets the criteria of professionalism, scientific and methodological relevance.	
Class syllabus: 1. The doctoral student, after consultation with the supervisor, shall develop scientific texts that meet the criteria of professionalism, scientific and methodological relevance. 2. The doctoral student will individually ensure the publication of the given texts in a scientifically peer-reviewed periodical registered in the Current Contents database. 3. The doctoral student respects the ethics of publishing, each scientific text is original and the doctoral student publishes it only once, while the translation of the content of the original text is not considered as another original scientific text.	
Recommended literature: Current sources on published issues.	
Languages necessary to complete the course: Slovak language, English language	
Notes: Lecturer: supervisor	
Past grade distribution Total number of evaluated students: 0	
Lecturers:	
Last change: 18.04.2022	

Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/459-PhD/21	Course title: The Original Publication in Current Contents Journal – First Author
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning, distance learning	
Number of credits: 40	
Recommended semester: 1., 2., 3., 4., 5., 6., 7., 8..	
Educational level: III.	
Prerequisites:	
Course requirements: The doctoral student obtains the rating completed with a credit value after submitting separate (source cover, circulation letters with ISBN or ISSN, source content, paper) published texts to the supervisor.	
Learning outcomes: a doctoral student under the guidance of a supervisor demonstrates the ability to work scientifically, i. e. a scientific text that meets the criteria of professionalism, scientific and methodological relevance.	
Class syllabus: 1. The doctoral student, after consultation with the supervisor, shall develop scientific texts that meet the criteria of professionalism, scientific and methodological relevance. 2. The doctoral student will individually ensure the publication of the given texts in a scientifically peer-reviewed periodical registered in the Current Contents database. 3. The doctoral student respects the ethics of publishing, each scientific text is original and the doctoral student publishes it only once, while the translation of the content of the original text is not considered as another original scientific text. 4. The doctoral student is the first author of the publication.	
Recommended literature: Current sources on published issues.	
Languages necessary to complete the course: Slovak language, English language	
Notes: Lecturer: supervisor	
Past grade distribution Total number of evaluated students: 0	
Lecturers:	
Last change: 18.04.2022	

Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/463-PhD/21	Course title: The Original Publication in non-Current Contents International or Domestic Journal Indexed in the SCOPUS Database (EPJ is Recommended)
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning, distance learning	
Number of credits: 10	
Recommended semester: 1., 2., 3., 4., 5., 6., 7., 8..	
Educational level: III.	
Prerequisites:	
Course requirements: The doctoral student obtains the rating completed with a credit value after submitting separate (source cover, circulation letters with ISBN or ISSN, source content, paper) published texts to the supervisor.	
Learning outcomes: a doctoral student under the guidance of a supervisor demonstrates the ability to work scientifically, i. e. a scientific text that meets the criteria of professionalism, scientific and methodological relevance.	
Class syllabus: 1. The doctoral student, after consultation with the supervisor, shall develop scientific texts that meet the criteria of professionalism, scientific and methodological relevance. 2. The doctoral student will individually ensure the publication of the given texts in non current contents international or domestic journal indexed in the SCOPUS database (European Pharmaceutical Journal is recommended) 3. The doctoral student respects the ethics of publishing, each scientific text is original and the doctoral student publishes it only once, while the translation of the content of the original text is not considered as another original scientific text.	
Recommended literature: Current sources on published issues.	
Languages necessary to complete the course: Slovak language, English language	
Notes: Teacher: supervisor	
Past grade distribution Total number of evaluated students: 0	
Lecturers:	

Last change: 18.04.2022

Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/462-PhD/21	Course title: The Original Publication in non-Current Contents Journal with IF (Impact Factor)
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning, distance learning	
Number of credits: 25	
Recommended semester: 1., 2., 3., 4., 5., 6., 7., 8..	
Educational level: III.	
Prerequisites:	
Course requirements: The doctoral student obtains the rating completed with a credit value after submitting separate (source cover, circulation letters with ISBN or ISSN, source content, paper) published texts to the supervisor.	
Learning outcomes: a doctoral student under the guidance of a supervisor demonstrates the ability to work scientifically, i. e. a scientific text that meets the criteria of professionalism, scientific and methodological relevance.	
Class syllabus: 1. The doctoral student, after consultation with the supervisor, shall develop scientific texts that meet the criteria of professionalism, scientific and methodological relevance. 2. The doctoral student will individually ensure the publication of the given texts in a scientifically peer-reviewed periodical with IF (impact factor). 3. The doctoral student respects the ethics of publishing, each scientific text is original and the doctoral student publishes it only once, while the translation of the content of the original text is not considered as another original scientific text.	
Recommended literature: Current sources on published issues.	
Languages necessary to complete the course: Slovak language, English language	
Notes: Lecturer: supervisor	
Past grade distribution Total number of evaluated students: 0	
Lecturers:	
Last change: 18.04.2022	

Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/461-PhD/21	Course title: The Original Publication in non-Current Contents Journal with IF (Impact Factor) - First Author
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning, distance learning	
Number of credits: 30	
Recommended semester: 1., 2., 3., 4., 5., 6., 7., 8..	
Educational level: III.	
Prerequisites:	
Course requirements: The doctoral student obtains the rating completed with a credit value after submitting separate (source cover, circulation letters with ISBN or ISSN, source content, paper) published texts to the supervisor.	
Learning outcomes: a doctoral student under the guidance of a supervisor demonstrates the ability to work scientifically, i. e. a scientific text that meets the criteria of professionalism, scientific and methodological relevance.	
Class syllabus: 1. The doctoral student, after consultation with the supervisor, shall develop scientific texts that meet the criteria of professionalism, scientific and methodological relevance. 2. The doctoral student will individually ensure the publication of the given texts in a scientifically peer-reviewed periodical with IF (impact factor). 3. The doctoral student respects the ethics of publishing, each scientific text is original and the doctoral student publishes it only once, while the translation of the content of the original text is not considered as another original scientific text. 4. The doctoral student is the first author of the publication.	
Recommended literature: Current sources on published issues.	
Languages necessary to complete the course: Slovak language, English language	
Notes: Lecturer: supervisor	
Past grade distribution Total number of evaluated students: 0	
Lecturers:	
Last change: 18.04.2022	

Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.

COURSE DESCRIPTION

University: Comenius University Bratislava	
Faculty: Faculty of Pharmacy	
Course ID: FaF/464-PhD/21	Course title: The Original Scientific Publication in non-Current Contents and non-Indexed International or Domestic Journal or Conference Proceeding
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning, distance learning	
Number of credits: 7	
Recommended semester: 1., 2., 3., 4., 5., 6., 7., 8..	
Educational level: III.	
Prerequisites:	
Course requirements: The doctoral student obtains rating completed with a credit value after submitting separate (source cover, circulation letters with ISBN or ISSN, source content, paper) published texts to the supervisor.	
Learning outcomes: a doctoral student under the guidance of a supervisor demonstrates the ability to work scientifically, i. e. a scientific text that meets the criteria of professionalism, scientific and methodological relevance.	
Class syllabus: 1. The doctoral student, after consultation with the supervisor, shall develop scientific texts that meet the criteria of professionalism, scientific and methodological relevance. 2. The doctoral student will individually ensure the publication of the given texts in non current contents and non-indexed international or domestic journal or conference proceeding. 3. The doctoral student respects the ethics of publishing, each scientific text is original and the doctoral student publishes it only once, while the translation of the content of the original text is not considered as another original scientific text.	
Recommended literature: Current sources on published issues.	
Languages necessary to complete the course: Slovak language, English language	
Notes: Teacher: supervisor	
Past grade distribution Total number of evaluated students: 0	
Lecturers:	
Last change: 18.04.2022	

Approved by: prof. PharmDr. Adriana Duriš Adameová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, prof. RNDr. Peter Mikuš, PhD., prof. PharmDr. Pavel Mučaji, PhD.