

## Course descriptions

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## COURSE DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/419-PhD/11	<b>Course title:</b> Active participation at the domestic scientific events
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week:   per level/semester:</b> <b>Form of the course:</b> on-site learning, distance learning	
<b>Number of credits:</b> 4	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b>	
<b>Learning outcomes:</b>	
<b>Class syllabus:</b>	
<b>Recommended literature:</b>	
<b>Languages necessary to complete the course:</b>	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 342	
ABS	NEABS
100,0	0,0
<b>Lecturers:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/418-PhD/11	<b>Course title:</b> Active participation at the international scientific events
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week: per level/semester:</b> <b>Form of the course:</b> on-site learning, distance learning	
<b>Number of credits:</b> 7	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b>	
<b>Learning outcomes:</b>	
<b>Class syllabus:</b>	
<b>Recommended literature:</b>	
<b>Languages necessary to complete the course:</b>	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 319	
ABS	NEABS
100,0	0,0
<b>Lecturers:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/425-PhD/11	<b>Course title:</b> Activities other (eg. A member of the organizing committee of the conference)
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> per week:   per level/semester: <b>Form of the course:</b> on-site learning, distance learning	
<b>Number of credits:</b> 3	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b>	
<b>Learning outcomes:</b>	
<b>Class syllabus:</b>	
<b>Recommended literature:</b>	
<b>Languages necessary to complete the course:</b>	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 61	
ABS	NEABS
100,0	0,0
<b>Lecturers:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/404-PhD/11	<b>Course title:</b> Authorship of teaching aids and texts
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week: per level/semester:</b> <b>Form of the course:</b> on-site learning, distance learning	
<b>Number of credits:</b> 20	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> completed the evaluation with a credit value after submitting the teaching aid or text (source cover, imprint letters with ISBN or ISSN) to the trainer.	
<b>Learning outcomes:</b> The doctoral student, led by the supervisor, demonstrated the ability to work in the preparation and writing of teaching aids and texts.	
<b>Class syllabus:</b> Doktorand po konzultácii so školiteľom spolupracuje na príprave a písaní učebných pomôcok textov so spoluautormi a s redakciou vydavateľa.	
<b>Recommended literature:</b> Current sources on the presented issues.	
<b>Languages necessary to complete the course:</b> Slovak language	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 1	
ABS	NEABS
100,0	0,0
<b>Lecturers:</b>	
<b>Last change:</b> 11.02.2022	
<b>Approved by:</b>	

## STATE EXAM DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/506-PhD/11	<b>Course title:</b> Biochemistry
<b>Number of credits:</b> 0	
<b>Educational level:</b> III.	
<b>Course requirements:</b> Successful completion of the exam.	
<b>Learning outcomes:</b> 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.	
<b>Class syllabus:</b> # 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.	
<b>State exam syllabus:</b>	
<b>Recommended literature:</b> 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.	
<b>Languages necessary to complete the course:</b> Slovak language	
<b>Notes:</b> Lecturers: doc. Mgr. Andrea Bilková, PhD.; doc. Mgr. Martina Hřeka Dubničková, PhD.; doc. PharmDr. Marek Obložinský, PhD.; RNDr. František Bilka, PhD.; Ing. Ľudmila Pašková, PhD.	

<b>Last change:</b> 11.04.2022
<b>Approved by:</b>



## STATE EXAM DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/801-PhD/11	<b>Course title:</b> Biology
<b>Number of credits:</b> 0	
<b>Educational level:</b> III.	
<b>State exam syllabus:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/426-PhD/11	<b>Course title:</b> Citation SCI, SSCI
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week:   per level/semester:</b> <b>Form of the course:</b> on-site learning, distance learning	
<b>Number of credits:</b> 5	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b>	
<b>Learning outcomes:</b>	
<b>Class syllabus:</b>	
<b>Recommended literature:</b>	
<b>Languages necessary to complete the course:</b>	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 67	
ABS	NEABS
100,0	0,0
<b>Lecturers:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/427-PhD/11	<b>Course title:</b> Citation other
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week:   per level/semester:</b> <b>Form of the course:</b> on-site learning, distance learning	
<b>Number of credits:</b> 3	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b>	
<b>Learning outcomes:</b>	
<b>Class syllabus:</b>	
<b>Recommended literature:</b>	
<b>Languages necessary to complete the course:</b>	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 9	
ABS	NEABS
100,0	0,0
<b>Lecturers:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	

## STATE EXAM DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/809-PhD/11	<b>Course title:</b> Clinical Pharmacology and Clinical Pharmacy
<b>Number of credits:</b> 0	
<b>Educational level:</b> III.	
<b>State exam syllabus:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/405-PhD/11	<b>Course title:</b> Co-authorship of teaching aids and texts
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week: per level/semester:</b> <b>Form of the course:</b> on-site learning, distance learning	
<b>Number of credits:</b> 10	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> He / She completed the evaluation with a credit value after submitting the teaching aid or text (source cover, imprint letters with ISBN or ISSN) to the trainer.	
<b>Learning outcomes:</b> The doctoral student, led by the supervisor, demonstrated the ability to cooperate and co-participate in the preparation and writing of teaching aids and texts.	
<b>Class syllabus:</b> The doctoral student, in consultation with the supervisor, participates in the preparation and writing of teaching aids with the author and other co-authors.	
<b>Recommended literature:</b> Current sources on the presented issues.	
<b>Languages necessary to complete the course:</b>	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 16	
ABS	NEABS
100,0	0,0
<b>Lecturers:</b>	
<b>Last change:</b> 11.02.2022	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/410-PhD/11	<b>Course title:</b> Co-supervisor of the final work of bachelor study
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week:   per level/semester:</b> <b>Form of the course:</b> on-site learning, distance learning	
<b>Number of credits:</b> 10	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b>	
<b>Learning outcomes:</b>	
<b>Class syllabus:</b>	
<b>Recommended literature:</b>	
<b>Languages necessary to complete the course:</b>	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 25	
ABS	NEABS
100,0	0,0
<b>Lecturers:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/407-PhD/11	<b>Course title:</b> Co-supervisor of the work to attend to Student's scientific conference
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> per week:   per level/semester: <b>Form of the course:</b> on-site learning, distance learning	
<b>Number of credits:</b> 10	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b>	
<b>Learning outcomes:</b>	
<b>Class syllabus:</b>	
<b>Recommended literature:</b>	
<b>Languages necessary to complete the course:</b>	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 37	
ABS	NEABS
100,0	0,0
<b>Lecturers:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/429-PhD/11	<b>Course title:</b> Completion of a defined stage of the scientific program of the PhD student
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> per week:   per level/semester: <b>Form of the course:</b> on-site learning, distance learning	
<b>Number of credits:</b> 5	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b>	
<b>Learning outcomes:</b>	
<b>Class syllabus:</b>	
<b>Recommended literature:</b>	
<b>Languages necessary to complete the course:</b>	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 85	
ABS	NEABS
98,82	1,18
<b>Lecturers:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	



## STATE EXAM DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/300-PhD/11	<b>Course title:</b> Dissertation Work Thesis Defense
<b>Number of credits:</b> 0	
<b>Educational level:</b> III.	
<b>State exam syllabus:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/430-PhD/11	<b>Course title:</b> Dissertation writting, if was taken to the defense
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week:   per level/semester:</b> <b>Form of the course:</b> on-site learning, distance learning	
<b>Number of credits:</b> 30	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b>	
<b>Learning outcomes:</b>	
<b>Class syllabus:</b>	
<b>Recommended literature:</b>	
<b>Languages necessary to complete the course:</b>	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 110	
ABS	NEABS
99,09	0,91
<b>Lecturers:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/400-PhD/11	<b>Course title:</b> Foreign language exam
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week: per level/semester:</b> <b>Form of the course:</b> on-site learning, distance learning	
<b>Number of credits:</b> 10	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b>	
<b>Learning outcomes:</b>	
<b>Class syllabus:</b>	
<b>Recommended literature:</b>	
<b>Languages necessary to complete the course:</b>	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 210	
ABS	NEABS
99,52	0,48
<b>Lecturers:</b> Mgr. Oľga Hollá, PhDr. Darina Kližanová, PaedDr. Viera Žufková, PhD., Ing. Mgr. Erika Jurišová, PhD.	
<b>Last change:</b>	
<b>Approved by:</b>	

## STATE EXAM DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/808-PhD/11	<b>Course title:</b> Genetics
<b>Number of credits:</b> 0	
<b>Educational level:</b> III.	
<b>State exam syllabus:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	

## STATE EXAM DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/807-PhD/11	<b>Course title:</b> Immunology
<b>Number of credits:</b> 0	
<b>Educational level:</b> III.	
<b>Course requirements:</b> Successful passing the exam	
<b>Learning outcomes:</b> By completing the course, the doctoral student will expand his/her knowledge about the importance and function of the human immune system as well as about the mechanisms of its action. In a comprehensive view, he/she will obtain additional information on how drugs, when applied to the body, act on specific immune mechanisms that are essential in the prevention and treatment of diseases. Student will also understand the principles and ways of using the immunodiagnostic methods that the pharmacist encounters in practice.	
<b>Class syllabus:</b> The course Immunology deals with the knowledge of basic and clinical immunology. The student is acquainted with the composition and function of the human immune system, the mechanisms of cellular and humoral immunity, as well as the preventive, therapeutic and practical use of immunology in medicine and pharmaceutical practice. The basic part of Immunology deals with inflammation, fever, structure and function of complement, cytokines, antigens and antibodies. Emphasis is placed on the preparation and use of monoclonal antibodies in pharmacy and medicine, without which modern diagnostics and therapy of diseases would not be possible. The clinical part of Immunology focuses on anti-infective, transplant and anti-tumor immunity and also deals with immunopathological diseases, as well as the latest immunostimulatory and immunosuppressive pharmaceuticals, preparation, application and use of vaccines and passive immunization products for disease prevention and therapy. The conclusion represent the principles of basic immunodiagnostic methods that pharmacists encounter in practice.	
<b>State exam syllabus:</b>	
<b>Recommended literature:</b> Buc M.: Základná a klinická imunológia. Bratislava: UK, 2009. 602 s. Kiňová Sepová H., Bilková A., Hrčka Dubníčková M., Dudík B.: Imunologické metódy: princípy a návody na praktické cvičenia. Bratislava: UK, 2021. Doan, T., Melvold, R., Viselli, S., Waltenbaugh, C.: Lippincotts Illustrated Reviews Immunology. Wolters Kluwer Health, 2021	
<b>Languages necessary to complete the course:</b> Slovak, English	
<b>Notes:</b> Teacher: doc. Mgr. Andrea Bilková, PhD., doc. Mgr. Martina Hrčka Dubníčková, PhD.	
<b>Last change:</b> 01.04.2022	

**Approved by:**

## COURSE DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/402-PhD/11	<b>Course title:</b> Individual study of the scientific literature
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week: per level/semester:</b> <b>Form of the course:</b> on-site learning, distance learning	
<b>Number of credits:</b> 5	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> The doctoral student obtains the evaluation 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 will give the evaluation to the doctoral student in the AIS and in the study report.	
<b>Learning outcomes:</b> 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.	
<b>Class syllabus:</b> 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	
<b>Recommended literature:</b> Current sources on the studied issues.	
<b>Languages necessary to complete the course:</b> Slovak language, English language	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 618	
ABS	NEABS
99,51	0,49
<b>Lecturers:</b>	

<b>Last change:</b> 11.02.2022
<b>Approved by:</b>



## COURSE DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/424-PhD/11	<b>Course title:</b> Involvement in the resolution of another research project
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week:   per level/semester:</b> <b>Form of the course:</b> on-site learning, distance learning	
<b>Number of credits:</b> 5	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b>	
<b>Learning outcomes:</b>	
<b>Class syllabus:</b>	
<b>Recommended literature:</b>	
<b>Languages necessary to complete the course:</b>	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 361	
ABS	NEABS
100,0	0,0
<b>Lecturers:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	

## STATE EXAM DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/806-PhD/11	<b>Course title:</b> Microbiology
<b>Number of credits:</b> 0	
<b>Educational level:</b> III.	
<b>State exam syllabus:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	

## STATE EXAM DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/803-PhD/11	<b>Course title:</b> Molecular Biology
<b>Number of credits:</b> 0	
<b>Educational level:</b> III.	
<b>Course requirements:</b> Successful completion of the exam.	
<b>Learning outcomes:</b> After completing of the subject the PhD. student will be able to understand the knowledge about the flow of genetic information and its possible influencing by drugs, about cell signaling systems due to the mechanisms of drug effects, and about the molecular-biological basis of some diseases and their therapy (f.e. influenza, AIDS, Alzheimer's disease). Also she/he will learn methodological procedures in molecular-biological laboratory (f.e. isolation of nucleic acids from biological material, electrophoretic procedures, PCR).	
<b>Class syllabus:</b> The flow of genetic information – the influencing possibilities of drugs: replication, transcription, translation and posttranslational modifications. Mutations and DNA repair mechanisms. Intracellular compartments and protein transport. Molecular-biological basis of some diseases. Principles of cell communication (cell signalling system). Networking of protein kinases and integration of signal processing. Transport processes in the cell. Principles of the DNA recombinant technology. Principles of gene manipulations. DNA and RNA vaccines. Epigenetics. Introduction to pharmacogenetics and pharmacogenomics.	
<b>State exam syllabus:</b>	
<b>Recommended literature:</b> Obložinský M. a kol.: Molekulárna biológia účinku liečiv a biotechnológia pre farmaceutov. 1.vyd. Bratislava: Univerzita Komenského, 2010. Papachristodoulou D., Snape A., Elliott W.H., Elliott D.C.: Biochemistry and Molecular Biology. 6.vyd., Oxford University Press, 2018.	
<b>Languages necessary to complete the course:</b> Slovak language, English language	
<b>Notes:</b> Teachers: doc. PharmDr. Marek Obložinský, PhD., RNDr. František Bilka, PhD., doc. Mgr. Andrea Bilková, PhD., Mgr. Ondrej Sprušanský, PhD., Ing. Ľudmila Pašková, PhD.	
<b>Last change:</b> 08.04.2022	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/423-PhD/11	<b>Course title:</b> Obtaining of "Grant FaF UK for young scientists" (Co-investigator of grant) 5)
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> per week:   per level/semester: <b>Form of the course:</b> on-site learning, distance learning	
<b>Number of credits:</b> 10	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b>	
<b>Learning outcomes:</b>	
<b>Class syllabus:</b>	
<b>Recommended literature:</b>	
<b>Languages necessary to complete the course:</b>	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 29	
ABS	NEABS
100,0	0,0
<b>Lecturers:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/422-PhD/11	<b>Course title:</b> Obtaining of "Grant FaF UK for young scientists" (Principal Investigator) 5)
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> per week:   per level/semester: <b>Form of the course:</b> on-site learning, distance learning	
<b>Number of credits:</b> 15	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b>	
<b>Learning outcomes:</b>	
<b>Class syllabus:</b>	
<b>Recommended literature:</b>	
<b>Languages necessary to complete the course:</b>	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 243	
ABS	NEABS
100,0	0,0
<b>Lecturers:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/421-PhD/11	<b>Course title:</b> Obtaining of "University Grant for Young Researchers" (Co - investigator of grant) 5)
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> per week:   per level/semester: <b>Form of the course:</b> on-site learning, distance learning	
<b>Number of credits:</b> 10	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b>	
<b>Learning outcomes:</b>	
<b>Class syllabus:</b>	
<b>Recommended literature:</b>	
<b>Languages necessary to complete the course:</b>	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 24	
ABS	NEABS
100,0	0,0
<b>Lecturers:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/420-PhD/11	<b>Course title:</b> Obtaining of "University Grant for Young Researchers" (Principal Investigator) 5)
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> per week:   per level/semester: <b>Form of the course:</b> on-site learning, distance learning	
<b>Number of credits:</b> 20	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b>	
<b>Learning outcomes:</b>	
<b>Class syllabus:</b>	
<b>Recommended literature:</b>	
<b>Languages necessary to complete the course:</b>	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 180	
ABS	NEABS
100,0	0,0
<b>Lecturers:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/406-PhD/11	<b>Course title:</b> Participation in the management of the thesis in Master's degree
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week: per level/semester:</b> <b>Form of the course:</b> on-site learning, distance learning	
<b>Number of credits:</b> 15	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> The course is successfully completed if the trained graduate 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.	
<b>Learning outcomes:</b> 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.	
<b>Class syllabus:</b> 1. The doctoral student methodically and professionally guides the 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 on the basis of it will award the evaluation (graduated) to the doctoral student in AIS and in the study report.	
<b>Recommended literature:</b> Current sources on the studied issues.	
<b>Languages necessary to complete the course:</b> Slovak language	
<b>Notes:</b>	



<b>Past grade distribution</b>	
Total number of evaluated students: 440	
ABS	NEABS
100,0	0,0
<b>Lecturers:</b>	
<b>Last change:</b> 14.02.2022	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/403-PhD/11	<b>Course title:</b> Passing other subject of the offer 2) of other university faculties
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week: per level/semester:</b> <b>Form of the course:</b> on-site learning, distance learning	
<b>Number of credits:</b> 0	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> 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.	
<b>Learning outcomes:</b> The doctoral student will gain knowledge of the subject at another faculty of the university.	
<b>Class syllabus:</b> The doctoral student is completing a designated subject at another faculty of the university at which he / she did not complete his / her second degree.	
<b>Recommended literature:</b> Current sources on the presented issues	
<b>Languages necessary to complete the course:</b> Slovak language	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 13	
ABS	NEABS
100,0	0,0
<b>Lecturers:</b>	
<b>Last change:</b> 11.02.2022	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/401-PhD/11	<b>Course title:</b> Passing prescribed doctoral lectures and seminars 1)
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week: per level/semester:</b> <b>Form of the course:</b> on-site learning, distance learning	
<b>Number of credits:</b> 10	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b>	
<b>Learning outcomes:</b>	
<b>Class syllabus:</b>	
<b>Recommended literature:</b>	
<b>Languages necessary to complete the course:</b>	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 569	
ABS	NEABS
99,3	0,7
<b>Lecturers:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/411-PhD/11	<b>Course title:</b> Passing the Dissertation exam
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week: per level/semester:</b> <b>Form of the course:</b> on-site learning, distance learning	
<b>Number of credits:</b> 20	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b>	
<b>Learning outcomes:</b>	
<b>Class syllabus:</b>	
<b>Recommended literature:</b>	
<b>Languages necessary to complete the course:</b>	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 203	
ABS	NEABS
99,51	0,49
<b>Lecturers:</b>	
<b>Last change:</b> 18.01.2022	
<b>Approved by:</b>	

## STATE EXAM DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/804-PhD/11	<b>Course title:</b> Pathological Physiology
<b>Number of credits:</b> 0	
<b>Educational level:</b> III.	
<b>Course requirements:</b> Successfully passing the exam.	
<b>Learning outcomes:</b> The participant of the course expands and completes the spectrum of syndromes and diseases from the individual organ systems, obtained within the study of the subject of pathology. Student learns in more detail recent and experimentally identified pathomechanisms leading to the damage of physiological functions of the cell, organs, and systems. Student will extend current knowledge about the disorders of metabolism, internal environment, adaptational mechanisms to the environmental changes and infectious diseases caused by bacteria, viruses, parasites, and fungi. Acquired advanced knowledge will be used in conjunction with other biomedically oriented subjects of pharmacological program.	
<b>Class syllabus:</b> Metabolic disorders, obesity, metabolic syndrome, dyslipidemia, disorders of vitamins and elements. Disorders of the internal environment, water and electrolyte management, acid-base homeostasis. Interaction of the organism with the environment. Adaptation, stress, cell death. Circulatory disorders in the cerebral circulation, pulmonary circulation, renal hypertension, ischemia in the mesenteric stream. Changes in cardiac function. Cardiomyopathy. Congenital heart diseases. Diseases of the valves. Skin diseases caused by infection, inflammation, allergies, skin efflorescences. Children's infectious diseases. Kidney and urinary tract diseases. Nephrotic syndrome, pyelonephritis, stones, incontinence. Pulmonary parenchymal diseases. Tuberculosis, pulmonary interstitial diseases, pneumoconiosis, fibrosis. Selected intestinal diseases. Malabsorption - celiac disease, inflammatory bowel diseases - Crohn's disease, ulcerative colitis, appendicitis. Changes in the function of the gallbladder and bile ducts. Infectious diseases - epidemiology, transmission, pathomechanisms, microbial flora, resistance, bacteria, parasites. Selected viral and fungal diseases. Pathophysiology of the musculoskeletal system. Diseases of joints and muscles.	
<b>State exam syllabus:</b>	
<b>Recommended literature:</b> Mellová Y. a kol.: Anatómia človeka pre nelekárske študijné programy. Vydavateľstvo: Osveta, 2010, 2018. 184 s. Merkunová A, Orel M., Anatomie a fyziologie člověka. Vydavateľstvo: Grada, Psyché. 2008, 304 s. Čalkovská A.: Fyziológia človeka pre nelekárske študijné odbory. Vydavateľstvo: Osveta, 2010	

<p>Javorka, K. a kol.: Lekárska fyziológia. Učebnica pre lekárske fakulty. Martin: Osveta, 2014. 744 s.</p> <p>Silbernagl, S., Despopoulos, A.: Atlas fyziologie člověka. 6. vyd. Praha: Grada Publishing, 2004, 448 s.</p> <p>Silbernagl, S., Lang, F.: Atlas patofyziologie. Praha: Grada, 2016. 404 s.</p> <p>Mohan, H.: Patológia. · Vydavateľstvo: Balneotherma, 2011.</p> <p>Plank, L., Hanáček J. a kol.: Patologická anatómia a patologická fyziológia. ·Vydavateľstvo: Osveta, 2007.</p> <p>Mačák J., Mačáková J., Dvořáčková J.. Patologie. 2.vydanie, Vydavateľstvo: Grada, 2012</p> <p>Hulín, I. a kol.: Patofyziológia a klinická fyziológia pre magisterské a bakalárske štúdium. Bratislava: SAP, 2005. 593 s.</p>
<p><b>Languages necessary to complete the course:</b></p> <p>Slovak language</p>
<p><b>Notes:</b></p> <p>Teachers: prof. PharmDr. Ján Klimas, PhD., MPH, PharmDr. Tomáš Rajtík, PhD., PharmDr. Eva Kráľová, PhD., PharmDr. Stanislava Kosírová, PhD.</p>
<p><b>Last change:</b> 08.04.2022</p>
<p><b>Approved by:</b></p>

## COURSE DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/409-PhD/11	<b>Course title:</b> Pedagogical activities - seminars
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week: per level/semester:</b> <b>Form of the course:</b> on-site learning, distance learning	
<b>Number of credits:</b> 15	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b>	
<b>Learning outcomes:</b>	
<b>Class syllabus:</b>	
<b>Recommended literature:</b>	
<b>Languages necessary to complete the course:</b>	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 237	
ABS	NEABS
99,58	0,42
<b>Lecturers:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/408-PhD/11	<b>Course title:</b> Pedagogical activity - exercises
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week:   per level/semester:</b> <b>Form of the course:</b> on-site learning, distance learning	
<b>Number of credits:</b> 10	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b>	
<b>Learning outcomes:</b>	
<b>Class syllabus:</b>	
<b>Recommended literature:</b>	
<b>Languages necessary to complete the course:</b>	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 471	
ABS	NEABS
99,79	0,21
<b>Lecturers:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	



## STATE EXAM DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/500-PhD/11	<b>Course title:</b> Pharmaceutical Chemistry
<b>Number of credits:</b> 0	
<b>Educational level:</b> III.	
<b>Course requirements:</b> Successful passing of the exam	
<b>Learning outcomes:</b> 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.	
<b>Class syllabus:</b> 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).	
<b>State exam syllabus:</b>	
<b>Recommended literature:</b> Chackalamannil, S., Rotella, D., & Ward, S. (2017). Comprehensive Medicinal Chemistry III, 3. Vyd. Elsevier, Amsterdam, Holandsko, 4536 s. Patrick, G.L. (2017). An Introduction to Medicinal Chemistry. 6. Vyd. Oxford University Press, New York, USA, 832 s. Remko, M. (2019). Základy medicínskej a farmaceutickej chémie, 3. Vyd. Remedika, Bratislava, SR, 480 s.	

Roche, V.F., Zito, S.V., Lemke, T.L., & Williams, D.A. (2019). Foye's Principles of Medicinal Chemistry, 8. Vyd. Wolters Kluwer Health Adis (ESP), Baltimore, USA, 1168 s.

Silverman, R.B., & Holladay, M.W. (2015). The Organic Chemistry of Drug Design and Drug Action. 3. Vyd. Elsevier, Waltham, USA, 521 s.

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

**Languages necessary to complete the course:**

Slovak language

**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.

**Last change:** 11.04.2022

**Approved by:**

## STATE EXAM DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/810-PhD/11	<b>Course title:</b> Pharmaceutical Technology
<b>Number of credits:</b> 0	
<b>Educational level:</b> III.	
<b>Course requirements:</b> final exam	
<b>Learning outcomes:</b> 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.	
<b>Class syllabus:</b> 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: <ul style="list-style-type: none"> <li>- Pharm. preparations as systems composed of drugs and excipients (constitutive, stabilizing, corrective, etc.), conditions for coexistence of components in pharm. preparation.</li> <li>- Procedures and devices for preparation and manufacturing of pharm. preparations</li> <li>- Evaluation and quality assurance of pharm. preparations in terms of composition, technology, structure</li> <li>- Relations between the pharm. preparation and bioavailability of administered drugs</li> <li>- Stability of pharm. preparations and its possible ensuring</li> <li>- Containers 'materials, technique for pharm. preparations 'containers, study of interactions between containers and drugs / excipients</li> </ul> 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).	
<b>State exam syllabus:</b>	

**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

**Last change:** 18.02.2022

**Approved by:**

## STATE EXAM DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/811-PhD/11	<b>Course title:</b> Pharmacoepidemiology
<b>Number of credits:</b> 0	
<b>Educational level:</b> III.	
<b>State exam syllabus:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	

## STATE EXAM DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/700-PhD/11	<b>Course title:</b> Pharmacognosy
<b>Number of credits:</b> 0	
<b>Educational level:</b> III.	
<b>Course requirements:</b> Successful completion of the exam.	
<b>Learning outcomes:</b> Graduates of Pharmacognosy will acquire the advanced knowledge necessary for their application not only in the professional discipline, but also in other areas of pharmacy in connection with the use of natural resources and individual content substances for therapeutic practice. The student has a broad overview of the biological and chemical processes leading to the formation of secondary metabolites of therapeutic relevance, and is able to use the chemical and biological properties of isolates in their practical use in pharmacy. He can search for new natural sources based on broad chemical, biological screening and also has a broad theoretical knowledge of pharmacognosy and phytochemistry.	
<b>Class syllabus:</b> The PhD student receives information related to the classification of drugs according to their effect on the human their use in prevention and therapy, including basic information on adverse effects and interactions involving individual active ingredients of natural origin. Emphasis is placed on drugs and their active substances that are part of registered phytopharmaceuticals in EU countries or are registered in the current edition of the European Pharmacopoeia. The main topics of the core knowledge of the course are: Biogenesis of natural substances and their classification according to given systems. Relationships of metabolic transformations of natural substances. Search for new sources of biologically active substances based on chemotaxonomic data. Methods of isolation of biologically active metabolites. Physico-chemical methods for determining the structure of natural substances. Evaluation of biological activities of natural isolates by in vivo and in vitro methods. Use of natural substances in therapy and prevention, especially of human diseases.	
<b>State exam syllabus:</b>	
<b>Recommended literature:</b> Nagy - Grančai - Mučaji: Farmakognózia : Biogenéza prírodných látok. - 1. slovenské vydanie. 2011. Liekové interakcie. Mechanizmy a manažment klinicky významných interakcií. (vybrané kapitoly, autori: Czigle, Tóth) Williamson E., Driver S., Baxter K. Stockleys Herbal Medicines Interactions. 2009. Benzie I., Wachtel-Galor S. eds. Herbal medicine. Biomolecular and clinical aspects. 2011. Polya G. Biochemical Targets of Plant Bioactive Compounds. A Pharmacological Reference Guide to Sites of Action and Biological Effects . 2003. Ebadi M. Pharmacodynamic Basis of Herbal Medicine, Second Edition 2006.	

<p>Berger S., Sicker D. Classics in Spectroscopy Isolation and Structure Elucidation of Natural Products. 2009.</p> <p>Katzung B.G. Basic and Clinical Pharmacology 14th Edn. 2018.</p> <p>Huang L-Q. Molecular Pharmacognosy. 2nd Edn. 2019.</p> <p>Carlton R.A. Pharmaceutical Microscopy. 2011.</p> <p>Európský liekopis. (aktuálne vydanie + jeho doplnky)</p>
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<b>Languages necessary to complete the course:</b>
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Slovak language, English language
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<b>Notes:</b>
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Lectures: prof. PharmDr. Pavel Mučaji, PhD., prof. Ing. Milan Nagy, CSc., doc. PharmDr. Szilvia Czige, PhD.
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<b>Last change:</b> 26.03.2022
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<b>Approved by:</b>
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## STATE EXAM DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/800-PhD/11	<b>Course title:</b> Pharmacology
<b>Number of credits:</b> 0	
<b>Educational level:</b> III.	
<b>Course requirements:</b> Successful passing of the exam	
<b>Learning outcomes:</b> Expansion and intensification of knowledge from pharmacology the can be used by the student to formulate scientific hypotheses to create a basis for the analytical part of the dissertation and to formulate conclusions following the obtained results.	
<b>Class syllabus:</b> The focus is on one or more of the following areas of pharmacology: <ul style="list-style-type: none"> <li>- pharmacodynamics with respect to the mechanism of action of drugs</li> <li>- pharmacokinetics</li> <li>- pharmacogenomics</li> <li>- adverse effects of drugs</li> <li>- drug overdose</li> <li>- therapeutic use of drugs</li> </ul> Special pharmacology <ul style="list-style-type: none"> <li>- pharmacology of drugs with effect on the central nervous system</li> <li>- pharmacology of drugs with effect on the autonomous nervous system</li> <li>- pharmacology of drugs with effect on the smooth muscles</li> <li>- pharmacology of drugs with effect on the cardiovascular system and kidneys</li> <li>- pharmacology of blood, inflammation</li> <li>- pharmacology of drugs with effect on the respiratory system</li> <li>- pharmacology of drugs with effect on the gastrointestinal system</li> <li>- pharmacology of drugs with effect on the endocrine system</li> <li>- pharmacology of anti-infective drugs</li> <li>- pharmacology of anticancer drugs</li> <li>- new directions of therapy of diseases using biological drugs</li> </ul>	
<b>State exam syllabus:</b>	
<b>Recommended literature:</b> 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
<b>Languages necessary to complete the course:</b> Slovak language, English language
<b>Notes:</b> 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
<b>Last change:</b> 11.04.2022
<b>Approved by:</b>

## STATE EXAM DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/802-PhD/11	<b>Course title:</b> Physiology
<b>Number of credits:</b> 0	
<b>Educational level:</b> III.	
<b>Course requirements:</b> Successful completion of the exam.	
<b>Learning outcomes:</b> The participant of the course, a doctoral student, expands and completes the knowledge about the functions and relationships between tissues, organs, and organ systems of the human body, acquired in the subject of physiology. He learns in more detail the newly or experimentally identified mechanisms of physiological functions of the cell, organs, and their systems. Participants acquire advanced knowledge about metabolism, internal environment, adaptation mechanisms and communication between various components of the body and their coordination and subsequent function. Participant will use such advanced knowledge in other biomedically oriented subjects of pharmaceutical studies.	
<b>Class syllabus:</b> Advanced insights to general Anatomy and Physiology of human body systems. Structural characteristics of the organs and tissue. Epithelial, connective tissues. Bones, skeleton. Muscular system. Types of muscle tissue. Excitation-Contraction Coupling (ECC). Mechanism of contraction. Nervous system - organization, structure, function. Physiology of Nerve. Central nervous system. Peripheral nervous system - somatic, autonomic. Somatic, visceral reflex arc. Special Senses. Physiology of vision, hearing, equilibrium, and orientation. Endocrine System. Organization and feedback system. Hormones. Glands and their hormones. Organization of cardiovascular system. Structure, function, and factors affecting heart, vessels, circulation. ECG. Autonomic regulation of vascular lumen diameter. Blood pressure. Blood composition, plasma, elements, and their role in the body. Blood clotting. Lymphatic system. Respiratory System. Respiratory Tract, Mechanics of Breathing, Gas Transport, Neurochemical Control of Breathing. Digestive System. Anatomy and Function of the Organs. Basic functional units. Enterohepatic circulation. Secretory function of stomach, liver, pancreas, intestine. Physiology of digestion. Nutrition. Regulation of Body Temperature. Urinary System. Anatomy and Functions of the Kidneys, Accessory Excretory Structures, Urine. Countercurrent multiplier. Mechanism of micturition. Acid-Base Balance. Body Fluids. Anatomy and Physiology of Reproductive System. Male and Female Reproductive Organs, hormones, menstrual cycle.	
<b>State exam syllabus:</b>	
<b>Recommended literature:</b> Trojan, S. a kol.: Lékařská fyziologie. 4. vyd. Praha: Grada Publishing, 2004. 772 s. Kittnar, O. a kol.: Lékařská fyziologie. 1. vyd. Praha: Grada Publishing, 2011. 790 s. Silbernagl, S., Despopoulos, A.: Atlas fyziologie člověka. 6. vyd. Praha: Grada Publishing, 2004. 448 s. Javorka, K. a kol.: Lekárska fyziológia. Učebnica pre lekárske fakulty. Martin: Osveta,	

<p>2009, 2014. 744 s. Merkunová A, Orel M., Anatomie a fyziologie člověka. Vydavatel'stvo: Grada, Psyché. 2008, 304s.</p> <p>Mellová Y. a kol. : Anatomia človeka pre nelekárske študijné programy. Vydavatel'stvo: Osveta, 2010, 2018. 184 s.</p> <p>Čalkovská A.: Fyziológia človeka pre nelekárske študijné odbory. Vydavatel'stvo: Osveta, 2010.</p> <p>Stankovicova T. a kol. 2019, Anatomia a fyziológia: teoretické a praktické návody na cvičenia pre farmaceutov. UK Bratislava, 2. vydanie, 300 strán. <a href="http://www.fpharm.uniba.sk/fileadmin/faf/Pracoviska-ubory/KFT/Anat_fyz/fyziologia_skripta_web.pdf">http://www.fpharm.uniba.sk/fileadmin/faf/Pracoviska-ubory/KFT/Anat_fyz/fyziologia_skripta_web.pdf</a></p>
<p><b>Languages necessary to complete the course:</b></p> <p>Slovak language, English language</p>
<p><b>Notes:</b></p> <p>Teacher: prof. PharmDr. Adriana Duriš Adameová, PhD., doc. PharmDr. Peter Křenek, PhD., prof. PharmDr. Ján Klimas, PhD., MPH., doc. PharmDr. Anna Paul Hrabovská, PhD., PharmDr. Tomáš Rajtík, PhD., PharmDr. Eva Kráľová, PhD.</p>
<p><b>Last change:</b> 08.04.2022</p>
<p><b>Approved by:</b></p>

## COURSE DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/428-PhD/11	<b>Course title:</b> Presentation at the conference of young scientists
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week: per level/semester:</b> <b>Form of the course:</b> on-site learning, distance learning	
<b>Number of credits:</b> 5	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b>	
<b>Learning outcomes:</b>	
<b>Class syllabus:</b>	
<b>Recommended literature:</b>	
<b>Languages necessary to complete the course:</b>	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 132	
ABS	NEABS
100,0	0,0
<b>Lecturers:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/417-PhD/11	<b>Course title:</b> Professional publications in domestic journal
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week:   per level/semester:</b> <b>Form of the course:</b> on-site learning, distance learning	
<b>Number of credits:</b> 4	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b>	
<b>Learning outcomes:</b>	
<b>Class syllabus:</b>	
<b>Recommended literature:</b>	
<b>Languages necessary to complete the course:</b>	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 71	
ABS	NEABS
98,59	1,41
<b>Lecturers:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/416-PhD/11	<b>Course title:</b> Professional publications in international journals
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week:   per level/semester:</b> <b>Form of the course:</b> on-site learning, distance learning	
<b>Number of credits:</b> 7	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b>	
<b>Learning outcomes:</b>	
<b>Class syllabus:</b>	
<b>Recommended literature:</b>	
<b>Languages necessary to complete the course:</b>	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 15	
ABS	NEABS
100,0	0,0
<b>Lecturers:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	

## STATE EXAM DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/900-PhD/11	<b>Course title:</b> Retail Pharmacy and Social Pharmacy
<b>Number of credits:</b> 0	
<b>Educational level:</b> III.	
<b>Course requirements:</b> Successful completion of the exam.	
<b>Learning outcomes:</b> Social pharmacy - pharmacy enables the third-level doctoral student to develop theoretical knowledge and apply their skills to the social and economic aspects of the position of drugs and medicines in society. The necessary content is language training, enabling to confront the state and knowledge of individual aspects of medicine and drug in society abroad.	
<b>Class syllabus:</b> Theoretical problems of pharmacy and medicines in society - characteristics of medicines, ensuring the way and safety of medicines from their origin to use in the individual patient, 2. The share of pharmacy in social and health policy - WHO pharmaceutical programs, 3. Drug policy - legislation, system application, management systems, marketing application, consumption and need for drugs and medicines, 4. Pharmaceutical and pharmaceutical care - research, production, control of drugs and medicines, dispensing and provision of information, implementation of good manufacturing, distribution and pharmaceutical practice, 5. Pharmaceutical informatics - content, scope, programs and their use, drug compliance and abuse, self-treatment and its pharmaceutical aspects 6. Drug and society - position and importance of drug, pharmacoepidemiology, compliance, non-compliance, consumption and need for drugs, pharmacoconomics, pharmaceutical informatics, 7. The position of pharmacy in society and healthcare - social, health and drug policy, management and marketing of pharmaceutical activities, legislative aspects of drug policy implementation, 8. History of pharmacy and museology - the position of the drug in the various stages of social development.	
<b>State exam syllabus:</b>	
<b>Recommended literature:</b> Tesař, T., Babel'a, R.: Hodnotenie zdravotníckych technológií. SAP, Bratislava, 2014, 96 s. 2. Foltán, V.: Sociálna farmácia. Osveta, Martin, 2010, 203 s. 3. Foltán, V. a kol.: Manažment, marketing a liek. Herba, Bratislava, 2010, 155 s. 4. Tesař, T., Foltán, V.: Zdravotná starostlivosť, náklady, kvalita a výsledky, 5. Výkladový terminologický slovník ISPOR, 2008, 238 s. 6. Foltán, V. a kol.: Odporúčania pre ATC klasifikáciu liečiv a stanovenie hodnoty DDD, 7. Kriška, M. a kol.: Memorix klinickej farmakológie. SAP, Bratislava, 2006, 879 s. vybrané časti 8. Tesař, T. a kol.: Lekárstvo a legislatíva, Osveta, Martin, 2017, 226 s.	
<b>Languages necessary to complete the course:</b>	

Slovak language, English language
<b>Notes:</b> Teachers: doc. PharmDr. Tomáš Tesař, PhD., MBA, MPH, MSc (HTA), doc. PharmDr. Daniela Mináriková, PhD., MSc.
<b>Last change:</b> 08.04.2022
<b>Approved by:</b>



## COURSE DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/415-PhD/11	<b>Course title:</b> The original publication in non current contents domestic journals or conference proceedings
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> per week:   per level/semester: <b>Form of the course:</b> on-site learning, distance learning	
<b>Number of credits:</b> 7	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b>	
<b>Learning outcomes:</b>	
<b>Class syllabus:</b>	
<b>Recommended literature:</b>	
<b>Languages necessary to complete the course:</b>	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 147	
ABS	NEABS
99,32	0,68
<b>Lecturers:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/414-PhD/11	<b>Course title:</b> The original publication in non current contents international journals or conference proceedings
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week: per level/semester:</b> <b>Form of the course:</b> on-site learning, distance learning	
<b>Number of credits:</b> 15	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b>	
<b>Learning outcomes:</b>	
<b>Class syllabus:</b>	
<b>Recommended literature:</b>	
<b>Languages necessary to complete the course:</b>	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 77	
ABS	NEABS
100,0	0,0
<b>Lecturers:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/413-PhD/11	<b>Course title:</b> The original publication in peer-reviewed domestic journals
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week:   per level/semester:</b> <b>Form of the course:</b> on-site learning, distance learning	
<b>Number of credits:</b> 30	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b>	
<b>Learning outcomes:</b>	
<b>Class syllabus:</b>	
<b>Recommended literature:</b>	
<b>Languages necessary to complete the course:</b>	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 11	
ABS	NEABS
100,0	0,0
<b>Lecturers:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/412-PhD/11	<b>Course title:</b> The original publication in peer-reviewed international journals
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week:   per level/semester:</b> <b>Form of the course:</b> on-site learning, distance learning	
<b>Number of credits:</b> 35	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Course requirements:</b>	
<b>Learning outcomes:</b>	
<b>Class syllabus:</b>	
<b>Recommended literature:</b>	
<b>Languages necessary to complete the course:</b>	
<b>Notes:</b>	
<b>Past grade distribution</b> Total number of evaluated students: 226	
ABS	NEABS
99,12	0,88
<b>Lecturers:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	

## STATE EXAM DESCRIPTION

<b>Academic year:</b> 2021/2022	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/805-PhD/11	<b>Course title:</b> Toxicology
<b>Number of credits:</b> 0	
<b>Educational level:</b> III.	
<b>Course requirements:</b> Successfully passing the exam.	
<b>Learning outcomes:</b> <p>The class will enable the doctoral student to deepen and expand their knowledge about the toxic effects of xenobiotics on living organisms. The current boundaries of toxicology are considerably wide due to the number of chemical compounds in the environment, and toxic damage to the organism also occurs through long-term exposure to pollutants. It turns out that in today's developed societies there is a growing need for toxicologists; unfortunately, they are not specifically trained for this demand by any university. A well-educated pharmacist, who is constantly expanding their knowledge in the field of chemical-analytical and biological-pharmaceutical fields, could provide this need. In addition to toxicity, which is qualitatively influenced by dose, the second interesting property of chemical substances (drugs) is their storage in the body (accumulation).</p>	
<b>Class syllabus:</b> <p>Importance of toxicology for the field pharmacy. Factors influencing toxic effects. Basics of toxokinetics. Characteristics, course and complications of poisoning. Drug toxicology. Poisoning in children. Ethyl alcohol poisoning. Poisoning by addictive substances. Poisoning by substances of plant and animal origin. Chemical waste poisoning. Agricultural toxicology. Toxicology of ionizing radiation. Biological, chemical and radiation weapons. Antidote. Biological tests.</p>	
<b>State exam syllabus:</b>	
<b>Recommended literature:</b> <p>Tumová I.: Toxikológia pre farmaceutov, Herba, 2016          Mulder G.J.: Pharmaceutical toxicology, Pharmaceutical Press, 2006          Patočka J.: Úvod do obecné toxikológie. ISBN 80-86571-04-, Manus, Praha 2003          Horák J., Linhart I., Klusoň P.: Úvod do toxikológie a ekológie pro chemiky, 2004          Prokeš J.: Úvod do toxikológie, Praha, 2005          Prokeš J- et al. Základy toxikológie, Galén, 2005</p>	
<b>Languages necessary to complete the course:</b> Slovak language, English language	
<b>Notes:</b> <p>Lecturers: doc. PharmDr. Anna Paul Hrabovská, PhD.; doc. PharmDr. Marek Máťuš, PhD.; Mgr. Ondrej Sprušanský, PhD.; Mgr. Peter Vavrínek, PhD.; Mgr. Diana Vavrincová, PhD.</p>	
<b>Last change:</b> 11.04.2022	
<b>Approved by:</b>	