

## Course descriptions

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## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KJ/01-Mgr-A/00	<b>Course title:</b> Academic English Language Preparation (1)
<b>Educational activities:</b> <b>Type of activities:</b> practicals / lecture / seminar <b>Number of hours:</b> <b>per week:</b> 0 / 0 / 2 <b>per level/semester:</b> 0 / 0 / 28 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 2	
<b>Recommended semester:</b> 2.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Recommended prerequisites:</b> intermediate level of English	
<b>Course requirements:</b> - active presence at seminars - midterm test (15%) - final test (85%) To complete the course successfully a student must achieve at least 60%. Scale of assessment (preliminary/final): 15% / 85%	
<b>Learning outcomes:</b> After completing the seminars a student is able to understand professional texts, reproduce their content orally and in writing, using English professional terminology from the field of human body and the profession of a pharmacist. Thanks to professional texts a student can use English professional terminology in both professional and non-professional environments.	
<b>Class syllabus:</b> The lessons concentrate on the following topics: the human body, the body systems and their functions, pharmaceutical care, the role of a pharmacist, services available in a pharmacy, laboratory equipment.	
<b>Recommended literature:</b> Hollá, O., Kližanová, D., Žufková, V.: English for Pharmacists I. Bratislava: Vydavateľstvo UK, 2016. Grammar Workbook I	
<b>Languages necessary to complete the course:</b> English language	
<b>Notes:</b> Academic English Language Preparation (1-4) within Master Study Programme is obligatory elective and is carried out in English study programme in four semesters. The contents of these specialized professional courses closely follow the contents of other professional courses taught in the relevant semesters. It is therefore highly recommended to take the courses gradually from	

the 2nd to the 5th semester (including) of the study, i.e. Academic English Language Preparation (1) in the 2nd (summer) semester of study.

**Past grade distribution**

Total number of evaluated students: 698

A	B	C	D	E	FX
16,62	12,03	17,77	17,91	28,37	7,31

**Lecturers:** PaedDr. Viera Žufková, PhD., PhDr. Darina Kližanová

**Last change:** 05.03.2021

**Approved by:**

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KJ/02-Mgr-A/00	<b>Course title:</b> Academic English Language Preparation (2)
<b>Educational activities:</b> <b>Type of activities:</b> practicals / lecture / seminar <b>Number of hours:</b> <b>per week:</b> 0 / 0 / 2 <b>per level/semester:</b> 0 / 0 / 28 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 2	
<b>Recommended semester:</b> 3.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Recommended prerequisites:</b> intermediate level of English	
<b>Course requirements:</b> - active presence at seminars - midterm test (15%) - final test (85%) To complete the course successfully a student must achieve at least 60%. Scale of assessment (preliminary/final): 15% / 85%	
<b>Learning outcomes:</b> After completing the seminars a student is able to understand professional texts, reproduce their content orally and in writing, using English professional terminology from the field of factors influencing health condition. Thanks to professional texts a student can use English professional terminology in both professional and non-professional environments.	
<b>Class syllabus:</b> The lessons concentrate on the following topics: factors influencing our health, pollution of environment, drug abuse and drug addiction, health care, disease transmission.	
<b>Recommended literature:</b> Hollá, O., Kližanová, D., Žufková, V.: English for Pharmacists II. Bratislava: Vydavateľstvo UK, 2017. Grammar Workbook II	
<b>Languages necessary to complete the course:</b> English language	
<b>Notes:</b> Academic English Language Preparation (1-4) within Master Study Programme is obligatory elective and is carried out in English study programme in four semesters. The contents of these specialized professional courses closely follow the contents of other professional courses taught in the relevant semesters. It is therefore highly recommended to take the courses gradually from	

the 2nd to the 5th semester (including) of the study, i.e. Academic English Language Preparation (2) in the 3rd (winter) semester of study.

**Past grade distribution**

Total number of evaluated students: 594

A	B	C	D	E	FX
21,04	12,79	17,17	20,71	23,57	4,71

**Lecturers:** PaedDr. Viera Žufková, PhD., PhDr. Darina Kližanová

**Last change:** 05.03.2021

**Approved by:**

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KJ/03-Mgr-A/00	<b>Course title:</b> Academic English Language Preparation (3)
<b>Educational activities:</b> <b>Type of activities:</b> practicals / lecture / seminar <b>Number of hours:</b> <b>per week:</b> 0 / 0 / 2 <b>per level/semester:</b> 0 / 0 / 28 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 2	
<b>Recommended semester:</b> 4.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Recommended prerequisites:</b> intermediate level of English	
<b>Course requirements:</b> - active presence at seminars - midterm test (15%) - final test (85%) To complete the course successfully a student must achieve at least 60%. Scale of assessment (preliminary/final): 15% / 85%	
<b>Learning outcomes:</b> After completing the seminars a student is able to understand professional texts, reproduce their content orally and in writing, using English professional terminology from the field of basic chemical terminology and disease prevention. Thanks to professional texts a student can use English professional terminology in both professional and non-professional environments.	
<b>Class syllabus:</b> The lessons concentrate on the following topics: disease prevention, healthy way of life, balanced diet, vitamins, minerals, cosmetics, first aid, treatment in various situations and emergencies.	
<b>Recommended literature:</b> Bates, M., Dudley, T.: Nucleus: General Science. London: Longman, 1992 James, V.D.: Medicine. London: Prentice Hall, 1989 Course Reader III, Grammar Workbook III	
<b>Languages necessary to complete the course:</b> English language	
<b>Notes:</b> Academic English Language Preparation (1-4) within Master Study Programme is obligatory elective and is carried out in English study programme in four semesters. The contents of these specialized professional courses closely follow the contents of other professional courses taught in the relevant semesters. It is therefore highly recommended to take the courses gradually from	



the 2nd to the 5th semester (including) of the study, i.e. Academic English Language Preparation (3) in the 4th (summer) semester of study.

**Past grade distribution**

Total number of evaluated students: 528

A	B	C	D	E	FX
21,02	13,07	16,67	14,02	27,84	7,39

**Lecturers:** PaedDr. Viera Žufková, PhD., PhDr. Darina Kližanová

**Last change:** 10.12.2015

**Approved by:**

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KJ/04-Mgr-A/00	<b>Course title:</b> Academic English Language Preparation (4)
<b>Educational activities:</b> <b>Type of activities:</b> practicals / lecture / seminar <b>Number of hours:</b> <b>per week:</b> 0 / 0 / 2 <b>per level/semester:</b> 0 / 0 / 28 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 2	
<b>Recommended semester:</b> 5.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Recommended prerequisites:</b> intermediate level of English	
<b>Course requirements:</b> - active presence at seminars - midterm test (15%) - final test (85%) To complete the course successfully a student must achieve at least 60%. Scale of assessment (preliminary/final): 15% / 85%	
<b>Learning outcomes:</b> After completing the seminars a student is able to understand professional texts, reproduce their content orally and in writing, using English professional terminology from the field of pharmacology. Thanks to professional texts a student can use English professional terminology in both professional and non-professional environments.	
<b>Class syllabus:</b> The lessons concentrate on the following topics: common disorders, home medicine cabinet, drug classification, frequently prescribed drugs, their sources, composition and effects, alternative medicine, healing herbs - their structure and functions.	
<b>Recommended literature:</b> Bates, M., Dudley, T.: Nucleus: General Science. London: Longman, 1992 James, V.D.: Medicine.: London: Prentice Hall, 1989 Course Reader IV, Grammar Workbook IV	
<b>Languages necessary to complete the course:</b> English language	
<b>Notes:</b> Academic English Language Preparation (1-4) within Master Study Programme is obligatory elective and is carried out in English study programme in four semesters. The contents of these specialized professional courses closely follow the contents of other professional courses taught in the relevant semesters. It is therefore highly recommended to take the courses gradually from	

the 2nd to the 5th semester (including) of the study, i.e. Academic English Language Preparation (4) in the 5th (summer) semester of study.

**Past grade distribution**

Total number of evaluated students: 386

A	B	C	D	E	FX
15,54	12,18	21,76	19,69	20,47	10,36

**Lecturers:** PaedDr. Viera Žufková, PhD., PhDr. Darina Kližanová

**Last change:** 10.12.2015

**Approved by:**

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KJ/15-Mgr-A/17		<b>Course title:</b> Academic English Language Preparation (5)			
<b>Educational activities:</b> <b>Type of activities:</b> seminar <b>Number of hours:</b> <b>per week:</b> 2 <b>per level/semester:</b> 28 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 2					
<b>Recommended semester:</b> 6.					
<b>Educational level:</b> I.II.					
<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: 0					
A	B	C	D	E	FX
0,0	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b> PhDr. Darina Kližanová, PaedDr. Viera Žufková, PhD.					
<b>Last change:</b>					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KJ/19-Mgr-A/19		<b>Course title:</b> Academic German Language Preparation (1)			
<b>Educational activities:</b> <b>Type of activities:</b> seminar <b>Number of hours:</b> <b>per week:</b> 2 <b>per level/semester:</b> 28 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 1					
<b>Recommended semester:</b> 2.					
<b>Educational level:</b> I.II.					
<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: 2					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b>					
<b>Last change:</b>					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KJ/12-Mgr-A/15	<b>Course title:</b> Academic German Language Preparation (2)
<b>Educational activities:</b> <b>Type of activities:</b> seminar <b>Number of hours:</b> <b>per week:</b> 2 <b>per level/semester:</b> 28 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 2	
<b>Recommended semester:</b> 3.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> - active participation of students in classroom - midterm test (15%) - final test (85%) To complete the course successfully a student must achieve at least 60%. Scale of assessment (preliminary/final): 15/85	
<b>Learning outcomes:</b> Students are able to use basic German grammar and practice the basic skills of listening, speaking, reading and writing in the present tense with an emphasis upon correct oral and written expressions and aural comprehension. Students are also introduced to various aspects of German culture in Germany and in German speaking countries focusing on the professional environment of pharmacies.	
<b>Class syllabus:</b> The course is for absolute beginners in German language who would like to obtain basic communication skills and grammar structures needed for everyday life in the academic and professional environment in a German speaking country.	
<b>Recommended literature:</b> Schritte international 2: Deutsch als Fremdsprache / Kursbuch + Arbeitsbuch mit Audio-CD zum Arbeitsbuch und interaktiven Übungen: Niveau A1/2, Hueber, 2009. Schritte international 3: Deutsch als Fremdsprache / Kursbuch + Arbeitsbuch mit Audio-CD zum Arbeitsbuch und interaktiven Übungen: Niveau A2/1, Hueber, 2009.	
<b>Languages necessary to complete the course:</b> English language, only minimal previous knowledge of German language is needed for this course.	
<b>Notes:</b> The course is held only in winter semester. It is highly recommended to take the course in the 3rd semester of the study.	

<b>Past grade distribution</b>					
Total number of evaluated students: 0					
A	B	C	D	E	FX
0,0	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b>					
<b>Last change:</b> 12.12.2015					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KJ/13-Mgr-A/15	<b>Course title:</b> Academic German Language Preparation (3)
<b>Educational activities:</b> <b>Type of activities:</b> seminar <b>Number of hours:</b> <b>per week:</b> 2 <b>per level/semester:</b> 28 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 2	
<b>Recommended semester:</b> 4.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> - active participation of students in classroom - midterm test (15%) - final test (85%) To complete the course successfully a student must achieve at least 60%. Scale of assessment (preliminary/final): 15/85	
<b>Learning outcomes:</b> Students are able to use basic German grammar and practice the basic skills of listening, speaking, reading and writing in the present tense with an emphasis upon correct oral and written expressions and aural comprehension. Students are also introduced to various aspects of German culture in Germany and in German speaking countries focusing on the professional environment of pharmacies.	
<b>Class syllabus:</b> The course is for absolute beginners in German language who would like to obtain basic communication skills and grammar structures needed for everyday life in the academic and professional environment in a German speaking country.	
<b>Recommended literature:</b> Schritte international 4: Deutsch als Fremdsprache / Kursbuch + Arbeitsbuch mit Audio-CD zum Arbeitsbuch und interaktiven Übungen: Niveau A2/2, Hueber, 2009. Schritte international 5: Deutsch als Fremdsprache / Kursbuch + Arbeitsbuch mit Audio-CD zum Arbeitsbuch und interaktiven Übungen: Niveau B1/1, Hueber, 2009.	
<b>Languages necessary to complete the course:</b> English language, only minimal previous knowledge of German language is needed for this course.	
<b>Notes:</b> The course is held only in summer semester. It is highly recommended to take the course in the 4th semester of the study.	



<b>Past grade distribution</b>					
Total number of evaluated students: 0					
A	B	C	D	E	FX
0,0	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b>					
<b>Last change:</b> 12.12.2015					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KJ/14-Mgr-A/15	<b>Course title:</b> Academic German Language Preparation (4)
<b>Educational activities:</b> <b>Type of activities:</b> seminar <b>Number of hours:</b> <b>per week:</b> 2 <b>per level/semester:</b> 28 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 2	
<b>Recommended semester:</b> 5.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> - active participation of students in classroom - midterm test (15%) - final test (85%) To complete the course successfully a student must achieve at least 60%. Scale of assessment (preliminary/final): 15/85	
<b>Learning outcomes:</b> Students are able to use basic German grammar and practice the basic skills of listening, speaking, reading and writing in the present tense with an emphasis upon correct oral and written expressions and aural comprehension. Students are also introduced to various aspects of German culture in Germany and in German speaking countries focusing on the professional environment of pharmacies.	
<b>Class syllabus:</b> The course is for absolute beginners in German language who would like to obtain basic communication skills and grammar structures needed for everyday life in the academic and professional environment in a German speaking country.	
<b>Recommended literature:</b> Schritte international 5: Deutsch als Fremdsprache / Kursbuch + Arbeitsbuch mit Audio-CD zum Arbeitsbuch und interaktiven Übungen: Niveau B1/1, Hueber, 2009. Schritte international 6: Deutsch als Fremdsprache / Kursbuch + Arbeitsbuch mit Audio-CD zum Arbeitsbuch und interaktiven Übungen: Niveau B1/2, Hueber, 2009.	
<b>Languages necessary to complete the course:</b> English language, previous knowledge of German language is needed for this course.	
<b>Notes:</b> The course is held only in winter semester. It is highly recommended to take the course in the 5th semester of the study.	

<b>Past grade distribution</b>					
Total number of evaluated students: 0					
A	B	C	D	E	FX
0,0	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b>					
<b>Last change:</b> 12.12.2015					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KJ/16-Mgr-A/17		<b>Course title:</b> Academic German Language Preparation (5)			
<b>Educational activities:</b> <b>Type of activities:</b> seminar <b>Number of hours:</b> <b>per week:</b> 2 <b>per level/semester:</b> 28 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 2					
<b>Recommended semester:</b> 7.					
<b>Educational level:</b> I.II.					
<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: 0					
A	B	C	D	E	FX
0,0	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b>					
<b>Last change:</b>					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KFANF/03-Mgr-A/00	<b>Course title:</b> Analysis of Substances in Biological Systems
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 1 / 2 / 0 <b>per level/semester:</b> 14 / 28 / 0 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 4	
<b>Recommended semester:</b> 7.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> Scale of assessment (preliminary/final): 50/50	
<b>Learning outcomes:</b>	
<b>Class syllabus:</b> Course Description: <ul style="list-style-type: none"> <li>• Pretreatment of biological samples               <ul style="list-style-type: none"> <li>o Biological material - characteristics, distribution, correct collection and storage</li> <li>o Matrix effects and how to prevent them</li> <li>o Pretreatment of biological samples - basic specifics and selection of a suitable method</li> <li>o Pre-treatment procedures for isolation and preconcentration of analyte from a complex matrix (homogenization, hydrolysis, filtration, centrifugation, extraction - focusing on their use for small amounts of biological material)</li> <li>o Deproteinization of biological material</li> </ul> </li> <li># Precipitation and salting out</li> <li># Membrane techniques</li> <li># Affinity precipitation               <ul style="list-style-type: none"> <li>o Specifics of sample pretreatment for analysis of proteomic biomarkers and biotherapeutics</li> </ul> </li> <li>• Validation of the analytical method for bioanalyses.               <ul style="list-style-type: none"> <li>o Validation parameters of the method (specificity, sensitivity, accuracy, precision, repeatability, reproducibility, robustness, LOD, LOQ, LLOQ, working range, linear dynamic range, recovery) with regard to the specifics of validation in biological systems</li> <li>o Validation protocol</li> <li>o FDA and EMA guidelines for bioanalysis</li> </ul> </li> <li>• Enzyme and immunochemical analytical methods               <ul style="list-style-type: none"> <li>o Enzymes as analytical reagents</li> <li>o Use of enzymatic methods in diagnostics</li> <li>o Precipitation immunochemical methods</li> <li>o Non-precipitation immunochemical methods</li> <li>o Use of immunochemical methods in diagnostics</li> </ul> </li> <li>• Biosensors</li> </ul>	

- o Characteristics of biosensors
- o Classification of biosensors (electrochemical, enzyme, optical, immunoaffinity)
- o Biosensors for biomedical research and practice
- Spectral methods in bioanalysis
- o Use of optical methods (UV-VIS, LIF) in the analysis of substances in biological systems
- o Mass spectrometry and its use in the analysis of biological samples (specifics of ionization techniques for the analysis of biological material, tandem mass spectrometry in bioanalysis)
- o Spectral methods in proteomics
- Chromatographic separation methods in bioanalysis
- o Bioaffinity, immunoaffinity and non-specific affinity chromatography
- o Specifics of chromatographic analysis of small molecules in biological samples
- o Specifics of chromatographic analysis of biomolecules (proteins, DNA, RNA)
- o Multidimensional comprehensive and heart-cut chromatographic procedures for qualitative and quantitative analysis in biological systems
- Electrophoretic separation methods in bioanalysis
- o Planar electrophoresis for purification and separation of biomolecules
- o Immunochemical methods based on the principle of electrophoresis
- o Capillary electromigration methods in the analysis of substances in biological samples
- o Multidimensional techniques in bioanalysis
- o Microfluidic systems in the analysis of peptides and proteins
- Analytical methods in therapeutic drug monitoring (the study of pharmacokinetics, biodistribution, and elimination of drugs)
- Analytical methods in metabolomics
- o analysis of small molecules (metabolites, potential biomarkers) in biological material
- Application of analytical methods in the analysis of peptides and proteins
- o Qualitative analysis (analysis of intact proteins, development of proteomic biomarkers, characterization of biotherapeutics)
- o Quantitative analysis (proteolysis, monitoring of small peptides and proteins as potential biomarkers in biological material, evaluation of biosimilarity in biotherapeutics)

#### **Recommended literature:**

Recommended Literature:

Mikuš, P., Maráková, K.: Hyphenated electrophoretic techniques in advanced analysis.  
Bratislava : KARTPRINT, 2012. 217 s.

#### **Languages necessary to complete the course:**

#### **Notes:**

#### **Past grade distribution**

Total number of evaluated students: 187

A	B	C	D	E	FX
19,25	6,42	17,11	21,39	35,83	0,0

**Lecturers:** prof. RNDr. Peter Mikuš, PhD., PharmDr. Juraj Piešťanský, PhD.

**Last change:** 13.08.2020

**Approved by:**

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KFANF/01-Mgr-A/19	<b>Course title:</b> Analytical Chemistry (1)
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 2 / 4 / 0 <b>per level/semester:</b> 28 / 56 / 0 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 7	
<b>Recommended semester:</b> 2.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> Obligatory course. Continuous assessment: The requirement for successful passing the practices is to undertake all tasks in practices and to reach sufficient points – minimum 60% out of 10 points (100%). Evaluation of knowledge includes written testing at the beginning of each practical - max. 4 points, the performance of the individually given practical task – max. 6 points, including a hand-written completed report. Practices are successfully passed only if total score obtained at the end of the semester is at least 60% of total available points (max. 10 points for each practical). Final assessment: After obtaining the required score from the laboratory practices (tests+tasks/reports) student can continue to final examination. The exam is performed in written form. It is necessary to reach at least 60% of the total score for successful passing of the examination. The 50% of the final grade represent the score from the laboratory practices and 50% represent the result from the final examination. Scale of assessment (preliminary/final): 50/50	
<b>Learning outcomes:</b> The student after undertaking the course get a consistent and sufficiently extensive theoretical, methodical knowledge base and practical experimental skills for the proof and the identification of inorganic and organic elements, based on chemical reactions. The acquired theoretical knowledge and experimental skills will enable the use of gravimetric and titration analytical methods, including the preparation of samples to solve assigned tasks. Chemical analysis of substances, including drugs, pharmaceuticals, nutritional supplements is carried out in accordance with the basic rules and requirements of safety and protection at work. The student will get not only the necessary information about chemical analysis in real conditions of scientific work, but also a demonstration of problem solving and interrelationships within the analyzed systems, which leads to the development of analytical thinking of the student in general.	
<b>Class syllabus:</b> Qualitative chemical analysis • General analytical chemistry	

- Analytical chemistry: Principle, its importance in pharmacy, division (purpose, methods, quantity of analyzed component).
  - Analysis procedure: sampling and treatment of the sample before chemical analysis, transfer to solution (mineralization), analysis protocol.
  - Analytical reaction requirements: sensitivity and selectivity of the analytical reaction, purity of chemical reagents.
  - Inorganic analysis
    - o Group, selective and specific reactions of cations with the emphasis on significant physiological and risk toxic elements.
    - o Group, selective and specific reactions of anions.
    - o Analytical proteolytic reactions. Buffers in analytical chemistry. Acids and bases in non-water solvents.
    - o Analytical complex-formation reactions and their equilibria. Masking of interfering components during chemical proofs of cations and anions. Organic complex-forming reagents
    - o Analytical precipitation reactions and their equilibria.
    - o Analytical oxidation-reduction reactions, kinetics. Catalytic and induced reactions.
    - o Selection of analytical method and procedure for the analysis of unknown sample.
  - Organic analysis
    - o Proof and determination of C, H, O, N, S and halogens in organic compounds.
    - o Classification of organic compounds according to the solubility test results as a part of organic sample characterization.
    - o Functional group analysis – proof of hydrocarbons, halogen derivatives, active hydrogen, sulphonic acids.
    - o Functional group analysis – proof of alcohols (primary, secondary, tertiary).
    - o Functional group analysis – proof of phenols (monovalent, aminophenols).
    - o Functional group analysis – proof of aldehydes and ketones, compounds with active methyl group - methylketons.
    - o Functional group analysis – proof of carboxylic acids, esters, amides, anhydrides.
    - o Functional group analysis – proof of amines, nitro- and nitroso compounds.
- Quantitative chemical analysis
- Gravimetry
- o Introduction to gravimetry – laboratory technique.
  - o Gravimetric determination of cations and anions.
- Volumetric analysis:
- o Introduction to volumetry – laboratory technique
  - o Titration curves, equivalence point, indicators, their properties and classification.
  - o Titration types – direct, indirect, back
  - o Acid-base determination. Acidimetry, alkalimetry, titrations in non-aqueous medium
  - o Complexometric determination. Chelatometry, mercurimetry
  - o Oxidation-reduction determinations: Permanganometry, iodometry, dichromatometry and bromometry
  - o Precipitation titrations: Argentometry

#### **Recommended literature:**

Mikuš, P., Mikušová, V.: Chemical Analysis Qualitative and Quantitative. Bratislava : UK, 2011. 133 s.

D.G. Watson, Pharmaceutical analysis, A textbook for pharmacy students and pharmaceutical chemists, Elsevier, Churchill Livingstone, London 2005.

#### **Languages necessary to complete the course:**



<b>Notes:</b>					
<b>Past grade distribution</b>					
Total number of evaluated students: 54					
A	B	C	D	E	FX
9,26	3,7	27,78	31,48	9,26	18,52
<b>Lecturers:</b> prof. RNDr. Peter Mikuš, PhD., PharmDr. Katarína Maráková, PhD., RNDr. Svetlana Dokupilová, PhD., PharmDr. Daniel Pecher, PhD.					
<b>Last change:</b> 05.03.2021					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KFANF/01-Mgr-A/00	<b>Course title:</b> Analytical Chemistry (1)
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 2 / 4 / 0 <b>per level/semester:</b> 28 / 56 / 0 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 7	
<b>Recommended semester:</b> 3.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> Scale of assessment (preliminary/final): 20/80	
<b>Learning outcomes:</b>	
<b>Class syllabus:</b> Qualitative chemical analysis <ul style="list-style-type: none"> <li>• General analytical chemistry</li> <li>• Analytical chemistry: Principle, its importance in pharmacy, division (purpose, methods, quantity of analyzed component).</li> <li>• Analysis procedure: sampling and treatment of the sample before chemical analysis, transfer to solution (mineralization), analysis protocol.</li> <li>• Analytical reaction requirements: sensitivity and selectivity of the analytical reaction, purity of chemical reagents.</li> <li>• Inorganic analysis               <ul style="list-style-type: none"> <li>o Group, selective and specific reactions of cations with the emphasis on significant physiological and risk toxic elements.</li> <li>o Group, selective and specific reactions of anions .</li> <li>o Analytical protolytic reactions. Buffers in analytical chemistry. Acids and bases in non-water solvents.</li> <li>o Analytical complex-formation reactions and their equilibria. Masking of interfering components during chemical proofs of cations and anions. Organic complex-forming reagents</li> <li>o Analytical precipitation reactions and their equilibria.</li> <li>o Analytical oxidation-reduction reactions, kinetics. Catalytic and induced reactions.</li> <li>o Selection of analytical method and procedure for the analysis of unknown sample.</li> </ul> </li> <li>• Organic analysis               <ul style="list-style-type: none"> <li>o Proof and determination of C, H, O, N, S and halogens in organic compounds.</li> <li>o Classification of organic compounds according to the solubility test results as a part of organic sample characterization.</li> <li>o Functional group analysis – proof of hydrocarbons, halogen derivatives, active hydrogen, sulphonic acids.</li> </ul> </li> </ul>	

- o Functional group analysis – proof of alcohols (primary, secondary, tertiary).
  - o Functional group analysis – proof of phenols (monovalent, aminophenols).
  - o Functional group analysis – proof of aldehydes and ketones, compounds with active methyl group - methylketons.
  - o Functional group analysis – proof of carboxylic acids, esters, amides, anhydrides.
  - o Functional group analysis – proof of amines, nitro- and nitroso compounds.
- Quantitative chemical analysis
- Gravimetry
    - o Introduction to gravimetry – laboratory technique.
    - o Gravimetric determination of cations and anions.
  - Volumetric analysis:
    - o Introduction to volumetry – laboratory technique
    - o Titration curves, equivalence point, indicators, their properties and classification.
    - o Titration types – direct, indirect, back
    - o Acid-base determination. Acidimetry, alkalimetry, titrations in non-aqueous medium
    - o Complexometric determination. Chelatometry, mercurimetry
    - o Oxidation-reduction determinations: Permanganometry, iodometry, dichromatometry and bromometry
    - o Precipitation titrations: Argentometry

**Recommended literature:**

Mikuš, P., Mikušová, V.: Chemical Analysis Qualitative and Quantitative. Bratislava : UK, 2011. 133 s.

D.G. Watson, Pharmaceutical analysis, A textbook for pharmacy students and pharmaceutical chemists, Elsevier, Churchill Livingstone, London 2005.

**Languages necessary to complete the course:**

**Notes:**

**Past grade distribution**

Total number of evaluated students: 601

A	B	C	D	E	FX
2,33	5,66	22,8	36,11	25,29	7,82

**Lecturers:** prof. RNDr. Peter Mikuš, PhD., PharmDr. Katarína Maráková, PhD., RNDr. Svetlana Dokupilová, PhD., PharmDr. Daniel Pecher, PhD.

**Last change:** 14.08.2020

**Approved by:**

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KFANF/02-Mgr-A/00	<b>Course title:</b> Analytical Chemistry (2)
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 2 / 5 / 0 <b>per level/semester:</b> 28 / 70 / 0 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 8	
<b>Recommended semester:</b> 4.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> Scale of assessment (preliminary/final): 20/80	
<b>Learning outcomes:</b>	
<b>Class syllabus:</b> The scope of Analytical chemistry, a subject integrating quantitative analysis, is to provide a consistent and sufficiently extensive theoretical and methodical knowledge base for the chemical and instrumental analysis of inorganic as well as organic compounds including drugs. Besides the above-mentioned direct objective, the education of analytical chemistry significantly influences the formation of logical train of thought of incoming pharmacist and his/her orientation in the field. Experimentally skilled student becomes familiar with a wide scale of pharmaceutically important substances and their properties related to biological activity and therapeutic action. Student acquires creativity and principles of a good laboratory practice. Validation of analytical methods is included. The development of all parts of analytical chemistry as a scientific discipline is characterized by emphasis on microanalysis and trace analysis, development of new methods and procedures and their optimisation. From the methodological point of view, the recent trend is based on computer art including data acquisition and processing and automation of analytical operations. These aspects form a theoretical background of education process with relation to the application of chemical and instrumental methods in pharmaceutical practice. Syllabus: Quantitative chemical analysis <ul style="list-style-type: none"> <li>• Volumetric analysis:               <ul style="list-style-type: none"> <li>o Indication of equivalence point, chemical indicators, their properties and classification. Titration curves, choice of indicators.</li> <li>o Acidimetry, alkalimetry</li> <li>o Titrations in non-aqueous medium</li> <li>o Oxidation-reduction titrations: Permanganometry, Iodometry, Bromatometry and bromometry</li> <li>o Chelatometry, Mercurimetry</li> <li>o Precipitation titrations: Argentometry</li> <li>o Dichromatometry</li> </ul> </li> <li>• Gravimetry</li> </ul>	

- o Gravimetric determination of cations.
- o Gravimetric determination of anions.
- Instrumental analysis
  - Elektrochemical methods:
    - o Potentiometry
    - o Ion-selective electrodes
    - o Polarography
    - o Amperometric titrations.
    - o Conductometric titrations.
    - o Electrogravimetry and coulometry.
  - Spectral analytical methods:
    - o Emission spectrum analysis.
    - o Fluorescence analysis.
    - o Atomic absorption spectroscopy.
    - o Molecular absorption spectroscopy in the visible and ultraviolet part of the spectrum.
    - o Infrared spectroscopy.
    - o Mass spectrometry.
    - o Refractometry, polarimetry.
  - Chromatographic analytical separation methods:
    - o Planar chromatography
    - o High performance liquid chromatography.
    - o Ion exchange chromatography.
    - o Gas chromatography.
    - Electromigration analytical separation methods:
      - o Electrophoresis in planar arrangement, electromigration techniques in capillary arrangement.
      - o Capillary zone electrophoresis (CE).
      - o Capillary isotachopheresis (ITP).
      - o Micellar electrokinetic chromatography (MEKC).
      - o Capillary gel electrophoresis (CGE).
      - o Isoelectric focusing (IEF).
  - Hyphenation of separation methods with spectral methods. HPLC-MS. CE-MS.
  - Nuclear analytical methods:
    - o Nuclear indicator methods – radiochromatography, isotope dilution analysis, radioimmunoanalysis and their applications.
    - o Nuclear analytical methods based on natural radioactivity.
    - o Activation analysis.
    - o Nuclear analytical methods – non activation interaction analysis.
    - o Beta dispersion analysis
    - o X-ray fluorescence.
    - o Identification of  $\beta$  and  $\gamma$  radiation.
- Sample preparation, validation in analytical chemistry, principles of good laboratory practice.

#### **Recommended literature:**

Mikuš, P., Mikušová, V.: Chemical Analysis Qualitative and Quantitative. Bratislava : UK, 2011. 133 s.

Mikuš, P., Maráková, K.: Hyphenated electrophoretic techniques in advanced analysis. Bratislava : KARTPRINT, 2012. 217 s.

D.G. Watson, Pharmaceutical analysis, A textbook for pharmacy students and pharmaceutical chemists, Elsevier, Churchill Livingstone, London 2005.

<b>Languages necessary to complete the course:</b>					
<b>Notes:</b>					
<b>Past grade distribution</b>					
Total number of evaluated students: 578					
A	B	C	D	E	FX
2,25	4,67	16,61	38,06	31,66	6,75
<b>Lecturers:</b> prof. RNDr. Peter Mikuš, PhD., PharmDr. Katarína Maráková, PhD., RNDr. Svetlana Dokupilová, PhD.					
<b>Last change:</b> 08.06.2017					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KFChL/01-Mgr-A/00		<b>Course title:</b> Applied Statistics for Pharmacists			
<b>Educational activities:</b> <b>Type of activities:</b> practicals / lecture / seminar <b>Number of hours:</b> <b>per week:</b> 0 / 1 / 2 <b>per level/semester:</b> 0 / 14 / 28 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 4					
<b>Recommended semester:</b> 4.					
<b>Educational level:</b> I.II.					
<b>Prerequisites:</b>					
<b>Course requirements:</b>					
<b>Learning outcomes:</b>					
<b>Class syllabus:</b> The curriculum is focused on basic definitions, explication of problems and essential computational relations which are explained by means of many practical examples. The theoretical knowledge acquired on the lectures will be deepened on the computational seminars, where the students solve model problems occurring in pharmaceutical praxis using computer-assisted techniques. The examination from the subject Applied statistics for pharmacists consists of elaboration and defending of a semestral work according to the student's interest and after consulting it with the lecturer. However, it must contain the full statistical treatment and interpretation of the selected pharmaceutical problem.					
<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: 92					
A	B	C	D	E	FX
31,52	13,04	38,04	1,09	2,17	14,13
<b>Lecturers:</b> RNDr. Tomáš Fazekáš, PhD.					
<b>Last change:</b> 02.06.2015					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KFT/22-Mgr-A/14		<b>Course title:</b> Basics of Regulatory Pharmacy			
<b>Educational activities:</b> <b>Type of activities:</b> lecture / seminar <b>Number of hours:</b> <b>per week:</b> 1 / 1 <b>per level/semester:</b> 14 / 14 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 2					
<b>Recommended semester:</b> 8.					
<b>Educational level:</b> I.II.					
<b>Prerequisites:</b>					
<b>Recommended prerequisites:</b> FaF.KFT/08-Mgr-A/00 - Pharmacology and Toxicology (1) and FaF.KORF/12-Mgr-A/00 - Social Pharmacy and Pharmacoeconomics					
<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: 0					
A	B	C	D	E	FX
0,0	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b> prof. PharmDr. Ján Klimas, PhD., MPH					
<b>Last change:</b> 26.09.2017					
<b>Approved by:</b>					



## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KBMBL/03-Mgr-A/00	<b>Course title:</b> Biochemistry
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 3 / 4 / 0 <b>per level/semester:</b> 42 / 56 / 0 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 8	
<b>Recommended semester:</b> 4.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> Main condition for the practical exercises recognition is 60% yield as the sum of three semestral tests. The course is completed by examination made up of two parts written and oral.	
<b>Learning outcomes:</b> After completing of biochemistry course the student should manage the basic biochemical analysis including kinetic enzymology studies on cell and molecular level. More over should have a good knowledge about enzyme catalytic activity and subcellular location of some important enzymes what is the basic premise of understanding mechanism effects of drugs.	
<b>Class syllabus:</b> Dynamic picture of the biological function and properties of the higher protein structure. In this context are introduced enzymes,coenzymes,catalytic function, kinetics of enzyme reaction, inhibition, kinetic inhibition parameters and meaning for pharmacy. No less important is aspect relating to the metabolism of nutrients associated with energy generation in ATP form. Of this aspect is discussed the individual metabolic pathways of saccharides, lipids and proteins, their enzyme subcellular equipment including its regulation on signal molecules level. Krebs cycle and oxidative phosphorylation is introduced as a final catabolic process with emphasis on the interconnection both of them through reduced NADH and FADH <sub>2</sub> coenzymes that are reoxidated via electron and proton transport- processes located in the inner mitochondrial membrane. Conclusion is devoted to basic information on genetic principles,replication, transcription, recombination and regulation of gene expression.	
<b>Recommended literature:</b> Voet D., Voet J.: Biochemistry, John Wiley & Sons, USA, 2004, 3rd ed.Pelley J.: Biochemistry, Mosby Elsevier, 2007. Campbell M.K. Farrel S.O.: Biochemistry. Thomson Brooks-Cole, 2009. Garret R.H., Grisham C.M.: Biochemistry, Saunders College Publ. 1999.	
<b>Languages necessary to complete the course:</b> English language.	
<b>Notes:</b>	

<b>Past grade distribution</b>					
Total number of evaluated students: 597					
A	B	C	D	E	FX
11,56	12,06	19,26	24,46	29,48	3,18
<b>Lecturers:</b> RNDr. František Bilka, PhD., PharmDr. Renáta Kubíková, PhD., PharmDr. Andrea Balažová, PhD., doc. PharmDr. Marek Obložinský, PhD., Ing. Ľudmila Pašková, PhD., PharmDr. Katarína Šišková, PhD., Mgr. Ivana Holková, PhD.					
<b>Last change:</b> 02.06.2015					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KChTL/01-Mgr-A/00	<b>Course title:</b> Bioorganic Chemistry
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 2 / 0 / 0 <b>per level/semester:</b> 28 / 0 / 0 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 2	
<b>Recommended semester:</b> 3.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Recommended prerequisites:</b> Recommendation: Organic Chemistry 1	
<b>Course requirements:</b> a) To prepare a seminar paper b) Pass the written test. For passing the exam it is required to achieve more than 50 % of the points. Scale of assessment (preliminary/final): 20/80	
<b>Learning outcomes:</b> The basic aim of the course Bioorganic Chemistry lies in the understanding of biological processes at the level of organic reaction mechanisms and identifying the basic parameters that govern these processes. Bioorganic Chemistry then is to deal with the problems of living nature in which chemical factors play an important role.	
<b>Class syllabus:</b> Bioorganic Chemistry follows the course of Organic Chemistry. Due to the fact that biological objects represent complex systems, their study requires an interdisciplinary approach. The course in the form of lectures is focused on those areas of bioorganic chemistry which are related to the structure of biomolecules, their spatial arrangement and relationships to biological functions. The emphasis is laid not only on the compounds with dominant position in living objects, such as aminoacids, peptides, proteins, heterocyclic bases, mono- and polysaccharides, nucleotides and nucleic acids, lipids but also the on the knowledge of known mechanisms of chemical reactions taking place in a biological system. Watching the rules of creating of macromolecular structure of organisms and their mutual interactions also with other molecules belong to other areas to be studied by bioorganic chemistry. The detailed knowledge of the structure and chemical processes occurring in a biological system allow to create bio-analogical chemical systems operating on a similar principle as in living nature (biomembranes, enzymatic catalysis, etc...) for practical use.	
<b>Recommended literature:</b> 1. Devínsky F. et al. Organic Chemistry for Pharmacy Students. Comenius University Press, Bratislava, 2010	

2. Van Vranken, D., Weiss, G.: Introduction to Bioorganic Chemistry and Chemical Biology, Garland Science 2013
3. McMurry, J.W., Begley, T.P.: The Organic Chemistry of biological Pathways, W. H. Freeman, 2nd ed., 2015
4. Voet D., Voet J.: Biochemistry, John Wiley & Sons, 3rd ed., 2004

**Languages necessary to complete the course:**

English language

**Notes:**

The course is held only in winter semester.

Teachers: Assoc. prof. PharmDr. Jindra Valentová, PhD.

**Past grade distribution**

Total number of evaluated students: 21

A	B	C	D	E	FX
66,67	14,29	4,76	9,52	4,76	0,0

**Lecturers:** doc. PharmDr. Jindra Valentová, PhD.

**Last change:** 25.09.2017

**Approved by:**

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KFChL/02-Mgr-A/00	<b>Course title:</b> Biophysics
<b>Educational activities:</b> <b>Type of activities:</b> practicals / lecture / seminar <b>Number of hours:</b> <b>per week:</b> 0 / 1 / 2 <b>per level/semester:</b> 0 / 14 / 28 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 4	
<b>Recommended semester:</b> 3.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Course requirements:</b>	
<b>Learning outcomes:</b>	
<b>Class syllabus:</b> Biophysics is that branch of knowledge that applies the principles of physics and chemistry and the methods of mathematical analysis and computer modeling to understand how the mechanisms of biological systems work. It seeks to explain biological function in terms of the molecular structures and properties of specific molecules. The educational background of pharmacy students from physics, physical chemistry and biochemistry is thus used and further widened. The teaching is problem-oriented and the importance of selected biophysical problems for pharmacy is stressed. The individual work of students and their active participation in seminars is emphasized. The subject is divided into two parts – lectures and seminars. In the first part, the students are acquainted with the basics of the subject. In the beginning of semester, each student must individually choose the theme of seminar essay and consult it with the teacher. During the semester, the student searches and studies individually the literature related to the theme and writes an essay about the theme based on the literature. In the second part of semester, the student presents results of his/her work in the form of a short talk at the seminar. Fellow students discuss the theme after presentation.	
<b>Recommended literature:</b> Hoppe, W. et al. (editors): Biophysics, Springer, Berlin 1983 Volkenstein, M.V.: General Biophysics, Academic Press, New York 1983 Rontó, G, Tarján, I.: Introduction to Medical Biophysics, Akademiai Kiadó, Budapest 1994 Kukurová, E.: Biophysical Elixir, Palaestrum, Bratislava 1997 Cotterill R.: Biophysics: An Introduction, Wiley, New York 2002 Glaser, R.: Biophysics, Springer, Berlin 2010 Srivastava, P.K.: Elementary Biophysics, Alpha Science International Ltd., London 2011 Dillon P.F.: Biophysics: A Physiological Approach, Cambridge University Press, Cambridge 2012 <a href="http://www.biophysics.org/education/resources.htm">http://www.biophysics.org/education/resources.htm</a>	
<b>Languages necessary to complete the course:</b>	
<b>Notes:</b>	

<b>Past grade distribution</b>					
Total number of evaluated students: 49					
A	B	C	D	E	FX
38,78	14,29	12,24	2,04	12,24	20,41
<b>Lecturers:</b> prof. RNDr. Daniela Uhríková, CSc., Mgr. Mária Klačsová, PhD.					
<b>Last change:</b> 02.06.2015					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KFChL/03-Mgr-A/00	<b>Course title:</b> Biophysics of voltage dependent membrane channels
<b>Educational activities:</b> <b>Type of activities:</b> practicals / lecture / seminar <b>Number of hours:</b> <b>per week:</b> 0 / 2 / 1 <b>per level/semester:</b> 0 / 28 / 14 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 4	
<b>Recommended semester:</b> 7.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Course requirements:</b>	
<b>Learning outcomes:</b>	
<b>Class syllabus:</b> Lipid composition of cell membrane, interactions of transmembrane proteins with lipid bilayer. Methods of detection of voltage dependent channels, method of voltage fixation and current fixation, techniques of isolation of single types of channels. Biophysics and pharmacology of voltage dependent sodium channels and hereditary diseases caused by mutations of these channels. Biophysics and pharmacology of voltage dependent calcium channels. L-type channels, neuronal channels and T-type channels. Hereditary diseases caused by mutations of these channels. Biophysics and pharmacology of voltage dependent potassium channels. Channels with inward and outward rectification. Channels modulated by ATP, G-proteins, cyclic nucleotides and by calcium. Repolarization of cardiac action potential by voltage dependent potassium channels. Hereditary diseases caused by mutations of voltage dependent potassium channels.	
<b>Recommended literature:</b> Catterall et al., Pharmacol Rev 57:397-409, 2005 Catterall et al., Pharmacol Rev 57:411-425, 2005 Lacinova, Gen Physiol Biophys 24:Suppl 1:1-78, 2005 Perez-Reyes, Physiol Rev 83:117-61, 2003 Pietrobon, Mol Neurobiol 25:31-50, 2002 Ashcroft, J Clin Invest 115:2047-2058, 2005 Nerbonne and Kass, Physiol Rev 85:1205-1253, 2005 Biel et al., Trends Cardiovasc Med 12:206-213, 2002 L. Lacinova, D. Uhrikova: Voltage dependent ion channels in excitable membranes, Comenius University, Bratislava 2011, in print	
<b>Languages necessary to complete the course:</b>	
<b>Notes:</b>	

<b>Past grade distribution</b>					
Total number of evaluated students: 0					
A	B	C	D	E	FX
0,0	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b> prof. RNDr. Daniela Uhríková, CSc.					
<b>Last change:</b> 02.06.2015					
<b>Approved by:</b>					



## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KBMBL/04-Mgr-A/00	<b>Course title:</b> Biotechnology
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 1 / 1 / 0 <b>per level/semester:</b> 14 / 14 / 0 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 2	
<b>Recommended semester:</b> 5.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> 100% participation on all forms of education. The final test has a writing form and for successful completion it is necessary to obtain minimal 50%.	
<b>Learning outcomes:</b> After attending lectures the student will get a theoretical knowledge about the new drugs development by biotechnological processes, based on the manipulation of nucleic acids and exploiting of recombinant DNA. He will get knowledge about the different cloning and expression vectors, and their application in the production of biopharmaceuticals (e.g. r-hormones, r-cytokines, r-vaccines, r-enzymes and monoclonal antibodies). The latest therapeutic trends are summarized in the lectures dealing with gene therapy, therapeutic cloning and the use of stem cells for treatment of people. After attending of practical exercises the student will learn the basics of work in the molecular biology lab, for example manipulation of nucleic acids, the preparation of recombinant plasmids and the use of PCR for identification of bacteria.	
<b>Class syllabus:</b> INTRODUCTION AND HISTORY OF BIOTECHNOLOGY: differences between classical and molecular biotechnology; relationship between biotechnology and other scientific disciplines, the application of biotechnology in different economic sectors (pharmaceutical and chemical industry, agriculture and others). Manipulation OF NUCLEIC ACIDS: isolation of NAs, DNA sequencing, restriction endonucleases, restriction maps, genome analysis, polymerase chain reaction. methods of Recombinant DNA: (preparation of recombinant DNA, cloning and expression vectors, plasmids and bacteriophages, DNA and cDNA libraries, hybridization of NAs). Plant biotechnology: development and application of transgenic plants, biopharmaceuticals produced by transgenic plants, GMO plants. BIOTECHNOLOGY in pharmacy: biopharmaceuticals, their advantages, expression systems, "upstream" and "downstream" phase of biopharmaceutical production. Biopharmaceuticals: Recombinant cytokines, enzymes, hormones (insulin, somatotropin, the gonadotrophic hormones), monoclonal antibodies and vaccines. Gene therapy and diagnostic: target diseases, the use of biotechnology in the preparation of vectors, gene therapy in vitro and in vivo, examples of human gene therapy, e.g. SCID, ornithine transcarbamylase deficiency, hemophilia, cystic fibrosis, cancers. Therapeutic cloning: differences between reproductive and therapeutic cloning, options, benefits and risks of reproductive cloning of animals, reproductive cloning of	

people. The application of stem cells in therapy: differences between embryonic and adult stem cells, stem cells of umbilical cord blood, ethics, examples of application.					
<b>Recommended literature:</b> Wink M.: An Introduction to Molecular Biotechnology. WILEY-VCH Verlag GmbH Co. KGaA, Weinheim, Germany, 2006.					
<b>Languages necessary to complete the course:</b> English language.					
<b>Notes:</b>					
<b>Past grade distribution</b> Total number of evaluated students: 206					
A	B	C	D	E	FX
24,76	27,18	25,73	11,17	7,77	3,4
<b>Lecturers:</b> doc. Mgr. Andrea Bilková, PhD., doc. Mgr. Martina Hřčka Dubníčková, PhD., PharmDr. Hana Kiňová Sepová, PhD.					
<b>Last change:</b> 02.06.2015					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KFANF/11-Mgr-A/19	<b>Course title:</b> Calculations in chemical analysis
<b>Educational activities:</b> <b>Type of activities:</b> seminar <b>Number of hours:</b> <b>per week:</b> 2 <b>per level/semester:</b> 28 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 1	
<b>Recommended semester:</b> 2.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> Elective course. Completion of lectures and seminars. The exam performed by the written test with a minimum threshold of success 60%. The assessment A: 100.0 - 92.1% B: 92.0 - 84.1% C: 84.0 - 76.1% D: 76.0 - 68.1% E: 68.0 - 60.0% FX: <60.0%.	
<b>Learning outcomes:</b> Course objectives: Calculations from various chemical equations are an integral part of chemical analysis. Elective course "Calculations in chemical analysis" which takes place in parallel with the course "Analytical Chemistry 1", helps students to overcome problematic areas of chemical analysis and at the same it extends this scope to other relevant calculations.	
<b>Class syllabus:</b> <ul style="list-style-type: none"> <li>• Determination of stoichiometry of chemical equations, calculations of equilibrium constants, pH</li> <li>• Calculation of concentration for the prepared solution (mass and molar concentration, dilution of solutions, mass and volume percentage)</li> <li>• Calculation of the content of the test substance in gravimetric determinations</li> <li>• Calculation of the content of the test substance in acid - base titrations (alkalimetry, acidimetry, acid-base determinations in non-aqueous solvents)</li> <li>• Calculation of the content of the analyte in complexation titrations (chelatometry, argentometric determination of cyanides, mercurimetry)</li> <li>• Calculation of the content of the analyte in redox titrations (iodometry, bromatometry, manganometry, dichromatometry)</li> <li>• Calculation of the content of the test substance in precipitation titration determinations (argentometry)</li> <li>• Evaluation of measured data of direct, backward and indirect titrations</li> </ul>	
<b>Recommended literature:</b> <ul style="list-style-type: none"> <li>• Mikuš, P., Mikušová, V.: Chemical Analysis Qualitative and Quantitative. Bratislava: UK, 2011. 133 pp.</li> <li>• web pages with appropriate keywords and their combinations</li> </ul>	

<b>Languages necessary to complete the course:</b> english					
<b>Notes:</b>					
<b>Past grade distribution</b> Total number of evaluated students: 0					
A	B	C	D	E	FX
0,0	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b> RNDr. Svetlana Dokupilová, PhD., PharmDr. Katarína Maráková, PhD.					
<b>Last change:</b> 03.06.2021					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KFT/11-Mgr-A/00		<b>Course title:</b> Clinical Pharmacology and Pharmacotherapy (1)			
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 2 / 0 / 2 <b>per level/semester:</b> 28 / 0 / 28 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 5					
<b>Recommended semester:</b> 7.					
<b>Educational level:</b> I.II.					
<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: 561					
A	B	C	D	E	FX
13,19	13,01	19,43	25,13	28,7	0,53
<b>Lecturers:</b> prof. RNDr. Magdaléna Kuželová, CSc., PharmDr. Stanislava Kosírová, PhD., Mgr. Diana Vavrincová, PhD., Mgr. Peter Vavrinec, PhD., PharmDr. Eva Kráľová, PhD., PharmDr. Tatiana Foltánová, PhD., PharmDr. Elena Ondriašová, CSc., Mgr. Gabriel Dóka, PhD., PharmDr. Zuzana Kiliánová, PhD., prof. PharmDr. Ján Klimas, PhD., MPH					
<b>Last change:</b> 02.06.2015					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KFT/12-Mgr-A/00		<b>Course title:</b> Clinical Pharmacology and Pharmacotherapy (2)			
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 3 / 0 / 2 <b>per level/semester:</b> 42 / 0 / 28 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 5					
<b>Recommended semester:</b> 8.					
<b>Educational level:</b> I.II.					
<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: 556					
A	B	C	D	E	FX
20,14	20,14	22,3	17,81	12,59	7,01
<b>Lecturers:</b> prof. RNDr. Magdaléna Kuželová, CSc., PharmDr. Elena Ondriašová, CSc., PharmDr. Eva Kráľová, PhD., PharmDr. Stanislava Kosírová, PhD., Mgr. Peter Vavrínek, PhD., Mgr. Diana Vavrinčová, PhD., PharmDr. Tatiana Foltánová, PhD., Mgr. Gabriel Dóka, PhD., PharmDr. Zuzana Kiliánová, PhD.					
<b>Last change:</b> 02.06.2015					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KORF/14-Mgr/A/00		<b>Course title:</b> Computer Data Processing			
<b>Educational activities:</b> <b>Type of activities:</b> practicals / lecture / seminar <b>Number of hours:</b> <b>per week:</b> 2 / 0 / 0 <b>per level/semester:</b> 28 / 0 / 0 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 2					
<b>Recommended semester:</b> 1.					
<b>Educational level:</b> I.II.					
<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: 595					
A	B	C	D	E	FX
30,76	10,76	23,53	10,76	21,51	2,69
<b>Lecturers:</b> doc. PharmDr. Tomáš Tesař, PhD., MBA					
<b>Last change:</b> 02.06.2015					
<b>Approved by:</b>					

## STATE EXAM DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/300-Mgr-A/15	<b>Course title:</b> Defense of Diploma Thesis
<b>Number of credits:</b> 4	
<b>Educational level:</b> I.II.	
<b>State exam syllabus:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	



## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KBMBL/05-Mgr-A/16		<b>Course title:</b> Diploma Thesis Preparation KBMBL (1)			
<b>Educational activities:</b> <b>Type of activities:</b> laboratory practicals <b>Number of hours:</b> <b>per week:</b> 6 <b>per level/semester:</b> 84 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 4					
<b>Recommended semester:</b> 8.					
<b>Educational level:</b> I.II.					
<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: 43					
A	B	C	D	E	FX
97,67	2,33	0,0	0,0	0,0	0,0
<b>Lecturers:</b> PharmDr. Andrea Balažová, PhD., doc. Mgr. Martina Hrčka Dubničková, PhD., doc. Mgr. Andrea Bilková, PhD., doc. RNDr. Marián Bukovský, PhD., Mgr. Ivana Holková, PhD., PharmDr. Katarína Šišková, PhD., PharmDr. Hana Kiňová Šepová, PhD., doc. PharmDr. Marek Obložinský, PhD., RNDr. František Bilka, PhD., Ing. Ľudmila Pašková, PhD., PharmDr. Renáta Kubíková, PhD., Mgr. Eva Drobná, PhD., PharmDr. Gabriela Greifová, PhD.					
<b>Last change:</b>					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KBMBL/06-Mgr-A/16		<b>Course title:</b> Diploma Thesis Preparation KBMBL (2)			
<b>Educational activities:</b> <b>Type of activities:</b> laboratory practicals <b>Number of hours:</b> <b>per week:</b> 25 <b>per level/semester:</b> 350 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 16					
<b>Recommended semester:</b> 10.					
<b>Educational level:</b> I.II.					
<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: 56					
A	B	C	D	E	FX
80,36	7,14	10,71	1,79	0,0	0,0
<b>Lecturers:</b> PharmDr. Andrea Balažová, PhD., doc. Mgr. Martina Hrčka Dubničková, PhD., doc. Mgr. Andrea Bilková, PhD., doc. RNDr. Marián Bukovský, PhD., Mgr. Ivana Holková, PhD., PharmDr. Katarína Šišková, PhD., PharmDr. Hana Kiňová Šepová, PhD., doc. PharmDr. Marek Obložinský, PhD., RNDr. František Bilka, PhD., Ing. Ľudmila Pašková, PhD., PharmDr. Renáta Kubíková, PhD., Mgr. Eva Drobná, PhD., PharmDr. Gabriela Greifová, PhD.					
<b>Last change:</b>					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KChTL/02-Mgr-A/16		<b>Course title:</b> Diploma Thesis Preparation KCHTL (1)			
<b>Educational activities:</b> <b>Type of activities:</b> laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 4 / 2 <b>per level/semester:</b> 56 / 28 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 4					
<b>Recommended semester:</b> 8.					
<b>Educational level:</b> I.II.					
<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: 53					
A	B	C	D	E	FX
94,34	5,66	0,0	0,0	0,0	0,0
<b>Lecturers:</b> RNDr. Roman Mikláš, PhD., doc. PharmDr. Miloš Lukáč, PhD., doc. PharmDr. Jindra Valentová, PhD., Mgr. Natalia Lucia Miklášová, PhD., Ing. Ladislav Habala, PhD., Mgr. Lucia Lintnerová, PhD., Mgr. Peter Herich, PhD.					
<b>Last change:</b> 09.06.2016					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KChTL/03-Mgr-A/16		<b>Course title:</b> Diploma Thesis Preparation KCHTL (2)			
<b>Educational activities:</b> <b>Type of activities:</b> laboratory practicals <b>Number of hours:</b> <b>per week:</b> 25 <b>per level/semester:</b> 350 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 16					
<b>Recommended semester:</b> 10.					
<b>Educational level:</b> I.II.					
<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: 56					
A	B	C	D	E	FX
85,71	12,5	0,0	0,0	0,0	1,79
<b>Lecturers:</b> doc. PharmDr. Jindra Valentová, PhD., Mgr. Natalia Lucia Miklášová, PhD., RNDr. Roman Mikláš, PhD., Ing. Ladislav Habala, PhD., doc. PharmDr. Miloš Lukáč, PhD., Mgr. Lucia Lintnerová, PhD., Mgr. Peter Herich, PhD.					
<b>Last change:</b> 09.06.2016					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KFANF/04-Mgr-A/16		<b>Course title:</b> Diploma Thesis Preparation KFANF (1)			
<b>Educational activities:</b> <b>Type of activities:</b> laboratory practicals <b>Number of hours:</b> <b>per week:</b> 6 <b>per level/semester:</b> 84 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 4					
<b>Recommended semester:</b> 8.					
<b>Educational level:</b> I.II.					
<b>Prerequisites:</b>					
<b>Course requirements:</b>					
<b>Learning outcomes:</b>					
<b>Class syllabus:</b>					
<b>Recommended literature:</b> Mikuš, P., Maráková, K.: Hyphenated electrophoretic techniques in advanced analysis. Bratislava : KARTPRINT, 2012. 217 s. Tekel', J., Mikuš, P.: Analýza látok v biologických systémoch, Univerzita Komenského, Bratislava 2004. D.G. Watson, Pharmaceutical analysis, A textbook for pharmacy students and pharmaceutical chemists, Elsevier, Churchill Livingstone, London 2005. web pages with appropriate key words and their combinations (spectral methods, spectrometry, spectroscopy, absorption, fluorescence, UV, IR, MS, NMR, electrochemical methods, polarography, biosensors, separation methods, electrophoresis, chromatography)					
<b>Languages necessary to complete the course:</b>					
<b>Notes:</b>					
<b>Past grade distribution</b> Total number of evaluated students: 45					
A	B	C	D	E	FX
64,44	8,89	17,78	6,67	2,22	0,0
<b>Lecturers:</b> RNDr. Svetlana Dokupilová, PhD., prof. RNDr. Peter Mikuš, PhD., PharmDr. Katarína Maráková, PhD., Ing. Oľga Lukačovičová, PhD.					
<b>Last change:</b> 08.06.2017					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KFANF/05-Mgr-A/16		<b>Course title:</b> Diploma Thesis Preparation KFANF (2)			
<b>Educational activities:</b> <b>Type of activities:</b> laboratory practicals <b>Number of hours:</b> <b>per week:</b> 25 <b>per level/semester:</b> 350 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 16					
<b>Recommended semester:</b> 10.					
<b>Educational level:</b> I.II.					
<b>Prerequisites:</b>					
<b>Course requirements:</b>					
<b>Learning outcomes:</b>					
<b>Class syllabus:</b>					
<b>Recommended literature:</b> Mikuš, P., Maráková, K.: Hyphenated electrophoretic techniques in advanced analysis. Bratislava : KARTPRINT, 2012. 217 s. Tekel, J., Mikuš, P.: Analýza látok v biologických systémoch, Univerzita Komenského, Bratislava 2004. D.G. Watson, Pharmaceutical analysis, A textbook for pharmacy students and pharmaceutical chemists, Elsevier, Churchill Livingstone, London 2005. web pages with appropriate key words and their combinations (spectral methods, spectrometry, spectroscopy, absorption, fluorescence, UV, IR, MS, NMR, electrochemical methods, polarography, biosensors, separation methods, electrophoresis, chromatography)					
<b>Languages necessary to complete the course:</b>					
<b>Notes:</b>					
<b>Past grade distribution</b> Total number of evaluated students: 44					
A	B	C	D	E	FX
36,36	31,82	20,45	6,82	4,55	0,0
<b>Lecturers:</b> prof. RNDr. Peter Mikuš, PhD., RNDr. Svetlana Dokupilová, PhD., PharmDr. Katarína Maráková, PhD.					
<b>Last change:</b> 08.06.2017					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KFB/01-Mgr-A/16		<b>Course title:</b> Diploma Thesis Preparation KFB (1)			
<b>Educational activities:</b> <b>Type of activities:</b> laboratory practicals <b>Number of hours:</b> <b>per week:</b> 6 <b>per level/semester:</b> 84 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 4					
<b>Recommended semester:</b> 8.					
<b>Educational level:</b> I.II.					
<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: 26					
A	B	C	D	E	FX
76,92	19,23	3,85	0,0	0,0	0,0
<b>Lecturers:</b> prof. Ing. Milan Nagy, CSc., prof. PharmDr. Pavel Mučaji, PhD., doc. PharmDr. Szilvia Czigle, PhD., Mgr. Jaroslav Tóth, PhD., doc. PharmDr. Silvia Bittner Fialová, PhD., PharmDr. Ivana Šušániková, PhD., doc. Ing. Miroslav Habán, PhD., Mgr. Ondrej Ďuriška, PhD., PharmDr. Vladimír Forman, PhD., RNDr. Ingrid Mistríková, CSc., RNDr. Daniela Tekeľová, CSc., PharmDr. Zuzana Scheerová Kontšeková, PhD., RNDr. Veronika Lachová, PhD., PharmDr. Katarína Rendeková, PhD., PharmDr. Elena Kurin, PhD.					
<b>Last change:</b> 09.06.2016					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KFB/02-Mgr-A/16		<b>Course title:</b> Diploma Thesis Preparation KFB (2)			
<b>Educational activities:</b> <b>Type of activities:</b> laboratory practicals <b>Number of hours:</b> <b>per week:</b> 25 <b>per level/semester:</b> 350 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 16					
<b>Recommended semester:</b> 10.					
<b>Educational level:</b> I.II.					
<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: 26					
A	B	C	D	E	FX
69,23	19,23	7,69	3,85	0,0	0,0
<b>Lecturers:</b> prof. PharmDr. Pavel Mučaji, PhD., doc. PharmDr. Szilvia Czigle, PhD., prof. Ing. Milan Nagy, CSc., doc. PharmDr. Silvia Bittner Fialová, PhD., Mgr. Jaroslav Tóth, PhD., doc. Ing. Miroslav Habán, PhD., Mgr. Ondrej Ďuriška, PhD., PharmDr. Vladimír Forman, PhD., RNDr. Ingrid Mistriková, CSc., RNDr. Daniela Tekel'ová, CSc., RNDr. Veronika Lachová, PhD., PharmDr. Zuzana Scheerová Kontšeková, PhD., PharmDr. Ivana Šušaníková, PhD., PharmDr. Elena Kurin, PhD., PharmDr. Katarína Rendeková, PhD.					
<b>Last change:</b> 09.06.2016					
<b>Approved by:</b>					



## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KFCh/03-Mgr-A/16		<b>Course title:</b> Diploma Thesis Preparation KFCH (1)			
<b>Educational activities:</b> <b>Type of activities:</b> laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 4 / 2 <b>per level/semester:</b> 56 / 28 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 4					
<b>Recommended semester:</b> 8.					
<b>Educational level:</b> I.II.					
<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: 1					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b> doc. Mgr. Fils Andriamainty, PhD., doc. PharmDr. Ivan Malík, PhD., doc. PharmDr. Miroslava Sýkorová, PhD., PharmDr. Vladimír Garaj, PhD., PharmDr. Iva Kapustíková, PhD., PharmDr. Matej Maruniak, PhD.					
<b>Last change:</b> 09.06.2016					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KFCh/04-Mgr-A/16		<b>Course title:</b> Diploma Thesis Preparation KFCH (2)			
<b>Educational activities:</b> <b>Type of activities:</b> laboratory practicals <b>Number of hours:</b> <b>per week:</b> 25 <b>per level/semester:</b> 350 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 16					
<b>Recommended semester:</b> 10.					
<b>Educational level:</b> I.II.					
<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: 8					
A	B	C	D	E	FX
62,5	0,0	37,5	0,0	0,0	0,0
<b>Lecturers:</b> doc. Mgr. Fils Andriamainty, PhD., doc. PharmDr. Ivan Malík, PhD., doc. PharmDr. Miroslava Sýkorová, PhD., PharmDr. Vladimír Garaj, PhD., PharmDr. Iva Kapustíková, PhD., PharmDr. Matej Maruniak, PhD.					
<b>Last change:</b> 09.06.2016					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KFChL/04-Mgr-A/16		<b>Course title:</b> Diploma Thesis Preparation KFCHL (1)			
<b>Educational activities:</b> <b>Type of activities:</b> laboratory practicals <b>Number of hours:</b> <b>per week:</b> 6 <b>per level/semester:</b> 84 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 4					
<b>Recommended semester:</b> 8.					
<b>Educational level:</b> I.II.					
<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: 19					
A	B	C	D	E	FX
84,21	0,0	5,26	0,0	0,0	10,53
<b>Lecturers:</b> prof. RNDr. Daniela Uhríková, CSc., RNDr. Mária Vojteková, CSc., Ing. Jarmila Oremusová, CSc., Mgr. Mária Klacsová, PhD., RNDr. Tomáš Fazekaš, PhD., doc. RNDr. Jana Gallová, CSc., doc. Ing. Vladimír Frečer, DrSc., RNDr. Alexander Búcsi, PhD., prof. RNDr. Ľubica Lacinová, DrSc., Mgr. Lukáš Hubčík, PhD., PharmDr. Gilda Liskayová, PhD.					
<b>Last change:</b>					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KFChL/05-Mgr-A/16		<b>Course title:</b> Diploma Thesis Preparation KFCHL (2)			
<b>Educational activities:</b> <b>Type of activities:</b> laboratory practicals <b>Number of hours:</b> <b>per week:</b> 25 <b>per level/semester:</b> 350 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 16					
<b>Recommended semester:</b> 10.					
<b>Educational level:</b> I.II.					
<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: 17					
A	B	C	D	E	FX
35,29	17,65	23,53	5,88	17,65	0,0
<b>Lecturers:</b> prof. RNDr. Daniela Uhríková, CSc., Ing. Jarmila Oremusová, CSc., Mgr. Mária Klacsová, PhD., RNDr. Tomáš Fazekaš, PhD., doc. RNDr. Jana Gallová, CSc., doc. Ing. Vladimír Frečer, DrSc., RNDr. Alexander Búcsi, PhD., prof. RNDr. Ľubica Lacinová, DrSc., Mgr. Lukáš Hubčík, PhD., doc. Mgr. Marcela Chovancová, PhD.					
<b>Last change:</b>					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KFT/06-Mgr-A/16		<b>Course title:</b> Diploma Thesis Preparation KFT (1)			
<b>Educational activities:</b> <b>Type of activities:</b> laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 4 / 2 <b>per level/semester:</b> 56 / 28 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 4					
<b>Recommended semester:</b> 8.					
<b>Educational level:</b> I.II.					
<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: 128					
A	B	C	D	E	FX
70,31	14,84	9,38	3,91	1,56	0,0
<b>Lecturers:</b> prof. RNDr. Magdaléna Kuželová, CSc., doc. MUDr. Tatiana Stankovičová, CSc., prof. PharmDr. Ján Klimas, PhD., MPH, doc. PharmDr. Peter Křenek, PhD., PharmDr. Elena Ondriašová, CSc., PharmDr. Tatiana Foltánová, PhD., PharmDr. Eva Král'ová, PhD., PharmDr. Stanislava Kosírová, PhD., doc. PharmDr. Marek Máťuš, PhD., Mgr. Ondrej Sprušanský, PhD., PharmDr. Tomáš Rajtík, PhD., PharmDr. Adrián Szobi, PhD., Mgr. Diana Vavrincová, PhD., Mgr. Peter Vavrínek, PhD., Mgr. Gabriel Dóka, PhD., PharmDr. Zuzana Kiliánová, PhD., Mgr. Lenka Bies Piváčková, PhD., doc. RNDr. Ingrid Tumová, CSc., doc. PharmDr. Anna Paul Hrabovská, PhD.					
<b>Last change:</b> 09.06.2016					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KFT/07-Mgr-A/16		<b>Course title:</b> Diploma Thesis Preparation KFT (2)			
<b>Educational activities:</b> <b>Type of activities:</b> laboratory practicals <b>Number of hours:</b> <b>per week:</b> 25 <b>per level/semester:</b> 350 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 16					
<b>Recommended semester:</b> 10.					
<b>Educational level:</b> I.II.					
<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: 125					
A	B	C	D	E	FX
37,6	30,4	19,2	7,2	5,6	0,0
<b>Lecturers:</b> prof. RNDr. Magdaléna Kuželová, CSc., doc. MUDr. Tatiana Stankovičová, CSc., prof. PharmDr. Ján Klimas, PhD., MPH, doc. PharmDr. Peter Křenek, PhD., PharmDr. Elena Ondriašová, CSc., PharmDr. Tatiana Foltánová, PhD., PharmDr. Eva Kráľová, PhD., PharmDr. Stanislava Kosírová, PhD., doc. PharmDr. Marek Máťuš, PhD., Mgr. Ondrej Sprušanský, PhD., PharmDr. Tomáš Rajtík, PhD., PharmDr. Adrián Szobi, PhD., PharmDr. Zuzana Kiliánová, PhD., Mgr. Diana Vavrincová, PhD., Mgr. Peter Vavrínek, PhD., Mgr. Gabriel Dóka, PhD., doc. RNDr. Ingrid Tumová, CSc., Mgr. Lenka Bies Piváčeková, PhD., doc. PharmDr. Anna Paul Hrabovská, PhD.					
<b>Last change:</b> 09.06.2016					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KGF/03-Mgr-A/16		<b>Course title:</b> Diploma Thesis Preparation KGF (1)			
<b>Educational activities:</b> <b>Type of activities:</b> laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 4 / 2 <b>per level/semester:</b> 56 / 28 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 4					
<b>Recommended semester:</b> 8.					
<b>Educational level:</b> I.II.					
<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: 21					
A	B	C	D	E	FX
90,48	0,0	9,52	0,0	0,0	0,0
<b>Lecturers:</b> PharmDr. Desana Matušová, PhD., PharmDr. Miroslava Špaglová, PhD., PharmDr. Eduard Tichý, PhD., PharmDr. Katarína Bauerová, DrSc., PharmDr. Terézia Haršányová, PharmDr. Alžbeta Lengyelová, PharmDr. Veronika Šimunková, PhD., PharmDr. Mária Raučinová, PhD., Mgr. Jana Selčanová, PharmDr. Milica Molitorisová, PhD.					
<b>Last change:</b> 09.06.2016					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KGF/04-Mgr-A/16		<b>Course title:</b> Diploma Thesis Preparation KGF (2)			
<b>Educational activities:</b> <b>Type of activities:</b> laboratory practicals <b>Number of hours:</b> <b>per week:</b> 25 <b>per level/semester:</b> 350 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 16					
<b>Recommended semester:</b> 10.					
<b>Educational level:</b> I.II.					
<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: 20					
A	B	C	D	E	FX
75,0	5,0	20,0	0,0	0,0	0,0
<b>Lecturers:</b> PharmDr. Desana Matušová, PhD., PharmDr. Milica Molitorisová, PhD.					
<b>Last change:</b> 09.06.2016					
<b>Approved by:</b>					



## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KORF/02-Mgr-A/16		<b>Course title:</b> Diploma Thesis Preparation KORF (1)			
<b>Educational activities:</b> <b>Type of activities:</b> practicals / seminar <b>Number of hours:</b> <b>per week:</b> 4 / 2 <b>per level/semester:</b> 56 / 28 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 4					
<b>Recommended semester:</b> 8.					
<b>Educational level:</b> I.II.					
<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: 121					
A	B	C	D	E	FX
80,17	14,88	3,31	0,83	0,83	0,0
<b>Lecturers:</b> PharmDr. Ľubica Lehocká, PhD., doc. PharmDr. Daniela Mináriková, PhD., JUDr. Mgr. Petra Capandová, PhD., doc. PharmDr. Tomáš Tesař, PhD., MBA, PharmDr. Miroslava Snopková, PhD., PharmDr. Zuzana Koblišková, PharmDr. Lucia Masaryková, PhD.					
<b>Last change:</b> 09.06.2016					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KORF/03-Mgr-A/16		<b>Course title:</b> Diploma Thesis Preparation KORF (2)			
<b>Educational activities:</b> <b>Type of activities:</b> independent work <b>Number of hours:</b> <b>per week:</b> 25 <b>per level/semester:</b> 350 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 16					
<b>Recommended semester:</b> 10.					
<b>Educational level:</b> I.II.					
<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: 121					
A	B	C	D	E	FX
66,94	18,18	4,96	1,65	8,26	0,0
<b>Lecturers:</b> PharmDr. Ľubica Lehocká, PhD., PharmDr. Miroslava Snopková, PhD., doc. PharmDr. Daniela Mináriková, PhD., JUDr. Mgr. Petra Capandová, PhD., doc. PharmDr. Tomáš Tesař, PhD., MBA, PharmDr. Zuzana Koblišková, PharmDr. Lucia Masaryková, PhD., PharmDr. Milica Molitorisová, PhD.					
<b>Last change:</b> 09.06.2016					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KFCh/01-Mgr-A/00	<b>Course title:</b> Drug Analysis
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 3 / 3 / 0 <b>per level/semester:</b> 42 / 42 / 0 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 7	
<b>Recommended semester:</b> 7.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> Conditions for Course Completion: To pass two semestral tests, each minimally 60 % rate and attendance at all laboratory practicals. Semestral tests consist of questions related to the lectures and laboratory practices of subject Drug analysis. After only a successful passing of those two tests, a final written exam will be allowed. To pass written final examination test. The final exam will consists of 20 questions, in which all the content of Drug analysis lectures and laboratory practicals will be represented. Each of the questions will be evaluated by three points. Maximal number of points is 60 = 100 % correct answers, student must obtain at least 60 % = 36 points, in order to pass it. The exam will last 120 minutes. For the final exam, an unlimited number of students can be registered. The evaluation of the exam is as follows: 100–92 % (evaluation level A), 92–84 % (B), 84–76 % (C), 76–68 % (D), 68–60 % (E), less than 60 % (FX, not passed). Scale of assessment (preliminary/final): 0/100.	
<b>Learning outcomes:</b> The aim of subject Drug analysis is to teach students in theory and practically the principles of methods and tests used for complex evaluation of drugs and medicines in accordance with applicable regulations – The European Pharmacopoeia 10th Ed. During laboratory practices students work with Pharmacopoeia with the aim to learn to orientate themselves quickly in huge quantity of factographic statements. Specifications and requirements for quality of drugs in connection with the GLP and GMP are integrated into the course. Course content is based on the requirements of The European Pharmacopoeia as the legal norm of a set of technical requirements – among other things, to evaluate the quality of drugs which has to be observed by anyone who treats with medicines, uses them in providing health care, or carries out state supervision in the field of pharmacy.	
<b>Class syllabus:</b> The Lectures Content: 1st week: Drug analysis, contents and importance of the subject. The European Pharmacopoeia, General chapters, Monographs. 2nd week: Qualitative analysis. Identification reactions of ions and functional groups.	

<p>3rd week: Qualitative analysis. Identification reactions of organic drugs. Group reactions and selective reactions – Part I.</p> <p>4th week: Qualitative analysis. Physical and physicochemical methods – General chapters in the European Pharmacopoeia – Part I.</p> <p>5th week: Qualitative analysis. Physical and physicochemical methods – General chapters in the European Pharmacopoeia – Part II.</p> <p>6th week: Qualitative analysis. Identification reactions of organic drugs. Group reactions and selective reactions – Part II.</p> <p>7th week: Purity of drugs and its control. Physical and physicochemical methods.</p> <p>8th week: Purity of drugs and its control. Limit tests for inorganic impurities.</p> <p>9th week: Quantitative analysis – Part I.</p> <p>10th week: Quantitative analysis – Part II.</p> <p>11th week: Good manufacturing practice. Validation in pharmaceutical analysis. Technical norms. Factory norms.</p> <p>12th week: Chemical analysis of drug substances. Quality control of the final pharmaceutical products. Stability of medicinal products. Pharmaceutical analysis in registration of medicinal products.</p> <p>13th week: Seminar. Computational exercises.</p> <p>The Laboratory Practicals Content:</p> <p>1st week: Qualitative analysis. Identification reactions of ions and functional groups – Inorganic ions.</p> <p>3rd week: Qualitative analysis. Identification reactions of ions and functional groups – Organic groups.</p> <p>5th week: Qualitative analysis. Identification reactions of inorganic and organic drugs. Physical and physicochemical methods. Semestral test.</p> <p>7th week: Purity of drugs and its control. Limit test for inorganic impurities.</p> <p>9th week: Quantitative analysis. Titrimetric methods – Part I. Semestral test.</p> <p>11th week: Quantitative analysis. Titrimetric methods – Part II. Physical and physicochemical methods.</p>
<p><b>Recommended literature:</b></p> <p>1/ The European Pharmacopoeia. 10th Ed. Strasbourg: Council of Europe, 2019.</p> <p>2/ Pedersen, O.: Pharmaceutical Chemical Analysis: Methods for Identification and Limit Tests. New York: Taylor &amp; Francis Group, 2006.</p> <p>3/ Hansen, S., Pedersen-Bjergaard, S., Rasmussen, K.: Introduction to Pharmaceutical Chemical Analysis. Chichester: John Wiley &amp; Sons, 2012.</p> <p>4/ Watson, D. G.: Pharmaceutical Analysis: A Textbook for Pharmacy Students and Pharmaceutical Chemists. Edinburgh: Elsevier/Churchill Livingstone, 2005.</p> <p>5/ Kar, A.: Pharmaceutical drug analysis. New Delhi: New Age International (P) Ltd., Publishers, 2005.</p>
<p><b>Languages necessary to complete the course:</b></p> <p>English language.</p>
<p><b>Notes:</b></p> <p>Form of the course: Lectures will be delivered on line using "MS Teams" and "Moodle" platforms, during scheduled time. Laboratory practicals will be delivered in-person at the faculty.</p>

<b>Past grade distribution</b>					
Total number of evaluated students: 537					
A	B	C	D	E	FX
6,89	14,53	24,39	17,69	32,77	3,72
<b>Lecturers:</b> PharmDr. Iva Kapustíková, PhD., PharmDr. Jana Čurillová, PhD.					
<b>Last change:</b> 09.09.2020					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KFT/24-Mgr-A/19	<b>Course title:</b> Functional and Pathological Anatomy
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 2 / 3 / 0 <b>per level/semester:</b> 28 / 42 / 0 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 6	
<b>Recommended semester:</b> 2.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> Personal attendance at all lectures and practicals. to pass 2 scheduled tests, each minimally 60% rate, Evaluation (mark/success rate): A 91-100%, B 81-90%, C 71-80%, D 66-70%, E 60-65%, FX # 60%). The final examtest is completed by students in computer or written form and by oral examination	
<b>Learning outcomes:</b> By passing the subject, the student acquires essential knowledge of the anatomy and physiology of the human body, individual organs, familiarize with the structure of tissues and basic anatomical and functional units. Student will recognise the functions of tissues, organs and also the regulatory, coordination and integration relationships between them. At the same time, he acquires basic knowledge from general pathology about cellular damage, regressive, metabolic and progressive changes at the level of the cell and subcellular structures, tissues and etiopathomechanisms, and manifestations of pathological changes at the organ level.	
<b>Class syllabus:</b> Human body – organization and structure, anatomical terminology. Structure of the human body – topography of organ systems, specific areas, relationship to function. Basic building and functional units of systems. Organization, functional anatomy of the organs of individual systems. Etiopathomechanisms of cellular damage, regressive, metabolic and progressive changes, inflammation, local disturbances of blood circulation and lymph. Metabolism disorders of proteins, fats, sugars (carbohydrates), water, vitamins and minerals. Developmental changes, structural lesions, disorders and functional changes in the individual organs of separate systems of the organism – nervous, cardiovascular, endocrine, respiratory, digestive, urogenital, sensory and skin. It acquires knowledge of rational nutrition and nutritional disturbances.	
<b>Recommended literature:</b> Vander's Human Physiology 12th Ed, McGraw/Hill, Ed., NY, by EP Widmaier, H Raff, KT Strang, 2011, ISBN 978/0/07/122215/0 Essentials of Human Physiology for Pharmacy, CEC Press, 2008, by LK McCorry (e-version) Essentials of Pathophysiology, 3rd edition, by C.M. Porth. Ed. Lippincott and Wilkins: Philadelphia, 2011, ISBN 0781770874	

General and Systemic Pathology, 4th edition, by J.C.E. Underwood. Ed. Churchill Livingstone: NY, 2004 ISBN 0443073341/9780443073342  
 Textbook of pathology, 7th edition, by H. Mohan. Ed. Jaypee Brothers Medical Publishers (P) Ltd, New Delhi, India, 2014, ISBN 978-9351523697  
 Essentials of Pathophysiology for Pharmacy, 1st edition, MM Zdanovicz, CRC Press, 2002, by ISBN 781587160363 (e-version)  
 Pathophysiology, by I Hulín, Bratislava: Slovak Academic Press, 1997, ISBN 80-85665-90-5  
 Lecture and exercise materials are available in Moodle's online system

**Languages necessary to complete the course:**  
 english

**Notes:**

**Past grade distribution**

Total number of evaluated students: 56

A	B	C	D	E	FX
0,0	1,79	8,93	35,71	44,64	8,93

**Lecturers:** doc. MUDr. Tatiana Stankovičová, CSc., prof. PharmDr. Ján Klimas, PhD., MPH, PharmDr. Tatiana Foltánová, PhD., PharmDr. Stanislava Kosírová, PhD., PharmDr. Eva Kráľová, PhD., PharmDr. Tomáš Rajtík, PhD., doc. PharmDr. Anna Paul Hrabovská, PhD., Mgr. Katarína Buzgóová, PhD., Mgr. Lenka Bies Piváčková, PhD., Mgr. Ondrej Sprušanský, PhD., PharmDr. Zuzana Kiliánová, PhD.

**Last change:** 09.09.2020

**Approved by:**

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KFT/19-Mgr-A/19		<b>Course title:</b> General Biology			
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals <b>Number of hours:</b> <b>per week:</b> 2 / 1 <b>per level/semester:</b> 28 / 14 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 5					
<b>Recommended semester:</b> 1.					
<b>Educational level:</b> I.II.					
<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: 68					
A	B	C	D	E	FX
10,29	17,65	8,82	20,59	26,47	16,18
<b>Lecturers:</b> Mgr. Ondrej Sprušanský, PhD., Mgr. Lenka Bies Piváčková, PhD.					
<b>Last change:</b> 24.08.2019					
<b>Approved by:</b>					



## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KChTL/06-Mgr-A/19	<b>Course title:</b> General and Inorganic Chemistry
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 2 / 3 / 2 <b>per level/semester:</b> 28 / 42 / 28 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 6	
<b>Recommended semester:</b> 1.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> Seminars: The student is required during the semester to complete all the seminars. During the course each student must write 3 interim tests (max 20 points each). To fulfill the conditions for the examination the student has to reach more than 50% of the total point score from all tests. Laboratory exercises: During the semester, the student is required to complete all laboratory exercises. According to the study programme he/she has to write one test from the laboratory techniques (0-40 points) and independently perform one synthetic work (0-10 points). To fulfill the conditions required for the examination the student has to reach more than 50% from the laboratory exercises of the total point score. The points reached within the seminars and laboratory work are multiplied by the factor of 0,3 and their value is 30% of the exam value in case of a successful completion of the exam. The coefficient obtained from the seminars applies solely to the academic year in which it was obtained. Examination: The course examinations are held exclusively in written form during the examination period. Participation at the exam is subject to the full completion of the seminars and laboratory exercises programme and to the acquisition of more than 50% of the total point score from the seminars and more than 50% of the total point score from the laboratory exercises. The written examination consists of two parts, A and B. Successful completion of the test is conditional on obtaining more than 50% from each section of the written test. At the successful completion the test's average point value obtained from both parts is multiplied by the factor of 0,7. The total mark of the exam is created by the value obtained from seminars and laboratory exercises (30%) and the examination test (70%). Grading scale of the overall result of the exam (after taking into account the outcome of the interim control): A: 87,01 % – 100,00 %; B: 77,01 % – 87,00 %; C: 67,01 % – 77,00 %; D: 57,01 % – 67,00 %; E: 50,01 % – 57,00 %; Fx: ≤ 50,00 %. Scale of assessment (preliminary/final): 30/70	
<b>Learning outcomes:</b> The aim of the course is to acquire the basic knowledge of general and inorganic chemistry. In the context of teaching the course will give students basic laboratory skills and carry out the synthesis of selected types of inorganic compounds. The gained knowledge and skills are necessary for the	

completion of the other chemical courses, such as Organic Chemistry 1, 2 and are also needed for the pharmaceutically oriented courses, e.g. Pharmaceutical Chemistry.

**Class syllabus:**

The course of General and Inorganic Chemistry is the first principal subject in the complex chemical preparation of students of pharmacy. The first part – general chemistry – includes topics such needed as the theoretical base of the follow up courses of chemical, pharmaceutical, biological and medical orientation. Great attention is paid to the issue of the chemical bond and the structure of substances, in particular to their relevance in explaining the characteristics of pharmaceutical compounds, including their pharmacotherapeutic effects. In the second part of the course – systematic inorganic chemistry – the chemistry of elements and their compounds is presented according to their rational division into the groups of the periodic system of elements. Alongside with the interpretation of the nature of the chemical reactivity of elements and their compounds, emphasis is laid on their use in pharmacy and medicine on the basis of their function, place and importance in biological systems. Needed attention shall be paid to the environmental education. The course is comprehensively designed, focusing on Master Degree accredited study programme of Pharmacy. Further pharmaceutically significant knowledge from the systematic inorganic chemistry is supplemented in the course of Selected Chapters in Inorganic Chemistry.

**Recommended literature:**

1. C. E. Housecroft, A. G. Sharpe: Inorganic Chemistry, 4th Edition, Pearson Publ. 2012.
2. J. C. Kotz, P. M. Treichel, J. R. Townsend: Chemistry & Chemical Reactivity, 7th Edition, Brooks/Cole 2010.
3. K. A. Strohfeldt: Essentials of Inorganic Chemistry for Students of Pharmacy, Pharmaceutical Sciences and Medicinal Chemistry, Wiley 2015

**Languages necessary to complete the course:**

English language

**Notes:**

The course is held only in winter semester.

Teachers: Ing. Ladislav Habala, PhD.; Assoc. prof. RNDr. Mária Kohútová, CSc.; Mgr. Lucia Lintnerová, PhD.; Natalia Miklášová, PhD.; Assoc. prof. Ing. Martin Pisárčík, CSc.

**Past grade distribution**

Total number of evaluated students: 56

A	B	C	D	E	FX
12,5	19,64	30,36	21,43	0,0	16,07

**Lecturers:** doc. Ing. Martin Pisárčík, CSc., Ing. Ladislav Habala, PhD., Mgr. Natalia Lucia Miklášová, PhD., Mgr. Lucia Lintnerová, PhD.

**Last change:** 23.08.2019

**Approved by:**

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KORF/22-Mgr-A/00	<b>Course title:</b> Health Psychology
<b>Educational activities:</b> <b>Type of activities:</b> practicals / lecture / seminar <b>Number of hours:</b> <b>per week:</b> 0 / 1 / 1 <b>per level/semester:</b> 0 / 14 / 14 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 2	
<b>Recommended semester:</b> 7.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> Student has to attend all lectures and seminars to be allowed to take the oral examination.	
<b>Learning outcomes:</b> After finishing the course student will gain basic overview in the following topics: social psychology, psychology of patients, psychology of diseases and psychology of healthcare professional, information on basic types of personalities, assertive behaviour, abilities to handle conflict situations, stress, how to communicate correctly and use the verbal and nonverbal communication, how to get ready for public presentation, how to communicate with patients, colleagues, other healthcare professionals, representatives of pharmaceutical industry, insurance companies and/or media. Students through various tests can find out information on themselves (what kind of personalities they are, what should they focus on while solving of stress and conflict situations, and how they can improve their communication abilities).	
<b>Class syllabus:</b> <ol style="list-style-type: none"> <li>1. Introduction to Health Psychology .</li> <li>2. Psychology in disease. Relationship patient – healthcare professional in psychology.</li> <li>3. Personality, forming of personality and its position in social group.</li> <li>4. Social interaction and communication.</li> <li>5. Verbal communication in the work of pharmacists.</li> <li>6. Non-verbal communication in the work of pharmacists.</li> <li>7. Optimal communication in the work of pharmacists.</li> <li>8. Conflict in community pharmacy and its resolution in team of co-workers.</li> <li>9. Stress situations in community pharmacy.</li> <li>10. Public requirements for pharmacist's personality.</li> <li>11. Basic types and characteristics of problematicl customers of pharmacy.</li> <li>12. Cooperation within a team of co-workers in healthcare, leadership.</li> <li>13. Public presentation, job interview and presentation of self.</li> </ol>	
<b>Recommended literature:</b> <ol style="list-style-type: none"> <li>1. Veatch, R.M., Haddad, A.: Case studies in pharmacy ethics, Oxford, Univesity Press, 2008, 331 p.</li> </ol>	

2. Bissel, P., Traulsen, J.M.: Sociology and pharmacy practice, London, Pharmaceutical Press, 2005, 226 p.
3. Wingfield, J., Badcott, D.: Pharmacy ethics and decision making, London, Pharmaceutical Press, 2007, 313 p.
4. Appelbe, G.E., Wingfield, J.: Dale and Appelbe's Pharmacy Law and Ethics, London, Pharmaceutical Press, 2005, 593 p.
5. Hungman, B.: Healthcare Communication, London, Pharmaceutical Press, 2009, 304 p.

**Languages necessary to complete the course:**

English language.

**Notes:**

**Past grade distribution**

Total number of evaluated students: 179

A	B	C	D	E	FX
41,9	29,05	7,82	8,94	7,26	5,03

**Lecturers:** PharmDr. Ľubica Lehocká, PhD.

**Last change:** 30.05.2016

**Approved by:**

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KBMBL/07-Mgr/A/00	<b>Course title:</b> Hygiene of Pharmaceutical Facilities
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 2 / 1 / 0 <b>per level/semester:</b> 28 / 14 / 0 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 4	
<b>Recommended semester:</b> 5.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> For credits is required successful completion of two pre-tests during the semester with a minimum success rate of 50% from each of tests and subject is terminated by the writing form with a minimum success rate of 60%.	
<b>Learning outcomes:</b> The subject focuses mainly on the explanation of the facts that are most important for the pharmacist. The rules used for compliance with hygiene air, water and waste in environment will be the first information to topic. The aim of environmental health is to inform students about how to improve the health status of the population, how to create conditions in environment that will ensure, respectively contributed to the protection of human health, its healthy development, physical and mental well-being. Food hygiene and tools general use is a field which studies the process of nutrition and addresses how their ensure for the physiological needs of man . Nutrition can increase the overall fitness of the organism, however, if it is irrational, causes the emergence of the widespread outbreak of civilization diseases (obesity, diabetes , cardiovascular disease, tumours). Health risks associated with food are caused by foreign substances contained in food. Therefore, following to the basic rules of nutrition learn students the adverse effects of contaminants in food and their prevention against them . In terms of experts, pharmacist obtains in the last part of the subject the necessary knowledge and information about observing the rules of hygiene, of the pharmaceutical equipment, of the work in these facilities and the hygiene in the preparation of pharmaceuticals, which requires discipline , knowledge of the dangerous factors and basic knowledge of effective measures necessary to achieve the health security in terms of microbiological contamination of pharmaceutical equipments.	
<b>Class syllabus:</b> The first part Hygiene pharmaceutical facilities engages in the basic constituents of the environment and its effects on human health - specifically, is it the position of hygiene and its role in the health and environmental hygiene air, water and waste. In the second part, students learn the basic rules of nutrition - specifically food hygiene. The third part emphasizes occupational hygiene, pharmaceutical facilities and rules of hygiene in the preparation of drugs. The basic contents of Hygiene pharmaceutical facilities is based on the current status of the individual disciplines relating to hygiene and environment specific rules or methods used in practice - requirements for	

hygiene in pharmacy, manipulation with medicines and drugs and evaluation of microbial products of the pharmaceutical industry in terms of requirements sterility and non-sterility according to Pharmacopoeia.					
<b>Recommended literature:</b> Ághová Ľ. and contributors: Hygiene (Environmental medicine), Comenius University, Bratislava 1997 textbook, pp.200. European Pharmacopoeia - selected chapters. Riddley R. John and Channing John: Occupational Health and Hygiene, Butterworth-Heinemann Ltd., Oxford, UK, 1999, pp. 241.					
<b>Languages necessary to complete the course:</b> English language.					
<b>Notes:</b>					
<b>Past grade distribution</b> Total number of evaluated students: 220					
A	B	C	D	E	FX
32,73	20,91	17,73	11,36	16,36	0,91
<b>Lecturers:</b> doc. Mgr. Martina Hrčka Dubníčková, PhD., doc. Mgr. Andrea Bilková, PhD., Mgr. Eva Drobná, PhD., PharmDr. Hana Kiňová Sepová, PhD., PharmDr. Gabriela Greifová, PhD.					
<b>Last change:</b> 02.06.2015					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KBMBL/08-Mgr-A/00	<b>Course title:</b> Immunodiagnostics
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 1 / 1 / 0 <b>per level/semester:</b> 14 / 14 / 0 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 2	
<b>Recommended semester:</b> 4.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> During the semester there will be 2 written exams for 20 points each. To obtain an A rating, a total of at least 37 points is required. To obtain a B rating, a total of at least 33 points is required. Requirements for the remaining ratings are as follows: C - at least 28 points, D - at least 24 points and E - at least 20 points. Credits shall not be granted to a student who scores less than 20 points on these written tests. A student may be excused from a maximum of 2 laboratory exercises. The student must submit duly completed and evaluated protocols of all completed exercises. To pass examination based on these exercises, students need to get at least 12 points out of 20.	
<b>Learning outcomes:</b> Students will become familiar with the diagnosis of the human immune profile, cellular and humoral factors of immunity, as well as serological and immunochemical techniques used to evaluate the immune profile. They will gain knowledge about the isolation, purification and preparation of vaccines and immune sera, as well as diagnosis of immune factors which are encountered in pharmaceutical practice.	
<b>Class syllabus:</b> The subject of Immunodiagnostics builds on the knowledge of basic immunology and clinical immunology. It deals with the human immune profile, the status of cellular and humoral immunity and the immunochemical techniques used to evaluate it. It deals in detail with the latest training techniques, recombinant DNA and subunit vaccines, detailed preparation of monoclonal antibodies and immunodiagnostic preparations. A separate section is devoted to modern immunoassay techniques for detection of antigens and antibodies, without which the modern diagnosis of diseases would be unimaginable.	
<b>Recommended literature:</b> Ferenčík, M. : Hanbook of Immunochemistry, Chapman & Hall, London, New York, 1993. Buc. M.: Basic and Clinical Immunology , Comenius University, Bratislava, 2008.	
<b>Languages necessary to complete the course:</b> English language.	
<b>Notes:</b>	

<b>Past grade distribution</b>					
Total number of evaluated students: 67					
A	B	C	D	E	FX
13,43	14,93	23,88	10,45	19,4	17,91
<b>Lecturers:</b> doc. RNDr. Marián Bukovský, PhD., doc. Mgr. Andrea Bilková, PhD.					
<b>Last change:</b> 02.06.2015					
<b>Approved by:</b>					



## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KBMBL/09-Mgr-A/00	<b>Course title:</b> Immunology
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 2 / 1 / 0 <b>per level/semester:</b> 28 / 14 / 0 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 4	
<b>Recommended semester:</b> 3.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> During the semester there will be 2 written exams for 20 points each. To obtain an A rating, a total of at least 37 points is required. To obtain a B rating, a total of at least 33 points is required. Requirements for the remaining ratings are as follows: C - at least 28 points, D - at least 24 points and E - at least 20 points. Credits shall not be granted to a student who scores less than 20 points on these written tests. A student may be excused from a maximum of 2 laboratory exercises. The student must submit duly completed and evaluated protocols of all completed exercises. To pass examination based on these exercises, students need to get at least 12 points out of 20.	
<b>Learning outcomes:</b> Students completing the subject should understand the mechanisms and function of the immune system and its fundamental importance to human life. They should understand that the application of drugs in the body influences the cellular and humoral immune mechanisms that are fundamental in the prevention and treatment of all diseases. In addition, they must understand the basic principles of immunodiagnostic methodologies which are encountered in the practice of pharmacy.	
<b>Class syllabus:</b> The subject of Immunology deals with knowledge of basic immunology as well as clinical immunology. The student learns the composition and function of the human immune system, mechanisms of cellular and humoral immunity at the cellular and molecular level, as well as the preventive-therapeutic and practical application of immunology in medicine and in pharmaceutical practice. The basic section of the course deals with inflammation, fever, structure and function of the complement, cytokines, antigens and antibodies. Emphasis is on the preparation and use of monoclonal antibodies in pharmacy and medicine, without which modern diagnosis and therapy of diseases would not have been possible. The clinical immunology section is focused on anti-infective, anti-tumor immunity and transplantation, and also deals with immunopathological diseases, as well as the latest immunostimulatory and immunosuppressive pharmaceuticals, preparation, application and use of vaccines and products for passive immunization for prevention and therapy of diseases. The basic principles of immunodiagnostic methodologies encountered in pharmaceutical practice constitute the final section.	
<b>Recommended literature:</b> Buc. M.: Basic and Clinical Immunology, Comenius University, Bratislava, 2008.	

Coico, R., Sunshine, G., Benjamini, E.: Immunology a Short Course, New York, Wiley-Liss, 2003.

**Languages necessary to complete the course:**

English language.

**Notes:**

**Past grade distribution**

Total number of evaluated students: 651

A	B	C	D	E	FX
6,3	8,76	21,35	16,59	34,41	12,6

**Lecturers:** doc. RNDr. Marián Bukovský, PhD., doc. Mgr. Andrea Bilková, PhD., doc. Mgr. Martina Hřčka Dubnicková, PhD., PharmDr. Hana Kiňová Sepová, PhD.

**Last change:** 02.06.2015

**Approved by:**

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KJ/10-Mgr-A/15		<b>Course title:</b> Latin Language for Pharmacists (2)			
<b>Educational activities:</b> <b>Type of activities:</b> seminar <b>Number of hours:</b> <b>per week:</b> 2 <b>per level/semester:</b> 28 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 2					
<b>Recommended semester:</b> 2.					
<b>Educational level:</b> I.II.					
<b>Prerequisites:</b> FaF.KJ/09-Mgr-A/15 - Latin Language for Pharmacists (1)					
<b>Course requirements:</b> active participation on seminars, writing of two semester tests with the overall grade at least 60%, written and oral exam Scale of assessment (preliminary/final): 15/85					
<b>Learning outcomes:</b> The student achieves a profound knowledge of specialized terminology based on words of Latin and Greek origin in the field of pharmacy. Terminology encompasses terms of pharmacopoeia, names of drugs of botanic origin and their mother plants, chemical substances used in industrial production of medicines and finally medical terms (mostly of anatomy and pathology). He (she) is able to make use of it in daily practice and possibly to create new terms in his (her) research activities.					
<b>Class syllabus:</b> The lessons concentrate on mediation of profound knowledge of specialized terminology used in pharmacy , on grammatical rules necessary for comprehension of specialized texts and on principles of formation of special terms on the basis of Latin and Greek language.					
<b>Recommended literature:</b> Vallová, E., Hamar, T.: Latin Language for Pharmacy Students. Bratislava: Comenius University, 2011 Ozábalová, L., Vallová, E., Hamar, T.: Trojjazyčný latinsko-anglicko-slovenský slovník pre študentov farmácie a medicíny. Bratislava: Univerzita Komenského, 2012					
<b>Languages necessary to complete the course:</b> English language					
<b>Notes:</b> the course is held only in the summer semester					
<b>Past grade distribution</b> Total number of evaluated students: 684					
A	B	C	D	E	FX
15,94	25,73	28,07	15,94	10,82	3,51

<b>Lecturers:</b> Mgr. Ivan Lábaj, PhD.
<b>Last change:</b> 27.11.2015
<b>Approved by:</b>

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KJ/17-Mgr-A/19		<b>Course title:</b> Latin Medicinal Terminology			
<b>Educational activities:</b> <b>Type of activities:</b> seminar <b>Number of hours:</b> <b>per week:</b> 2 <b>per level/semester:</b> 28 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 3					
<b>Recommended semester:</b> 1.					
<b>Educational level:</b> I.II.					
<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: 63					
A	B	C	D	E	FX
34,92	17,46	26,98	7,94	4,76	7,94
<b>Lecturers:</b> Mgr. Ivan Lábaj, PhD.					
<b>Last change:</b>					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KJ/18-Mgr-A/19		<b>Course title:</b> Latin Pharmaceutical Terminology			
<b>Educational activities:</b> <b>Type of activities:</b> seminar <b>Number of hours:</b> <b>per week:</b> 2 <b>per level/semester:</b> 28 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 2					
<b>Recommended semester:</b> 2.					
<b>Educational level:</b> I.II.					
<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: 48					
A	B	C	D	E	FX
33,33	29,17	16,67	12,5	0,0	8,33
<b>Lecturers:</b> Mgr. Ivan Lábaj, PhD.					
<b>Last change:</b>					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KORF/18-Mgr-A/00	<b>Course title:</b> Management Basics in Pharmacy
<b>Educational activities:</b> <b>Type of activities:</b> practicals / lecture / seminar <b>Number of hours:</b> <b>per week:</b> 0 / 2 / 1 <b>per level/semester:</b> 0 / 28 / 14 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 4	
<b>Recommended semester:</b> 4.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> Completion of lectures and seminars. Preliminary tests minimum 50% for each one. The exam performed by the written test with a minimum threshold of success 60%. The assessment: A = 100-95%, B = 94-85%, C = 84-75%, D = 74-70%, E = 69-60%, FX = 59% and less.	
<b>Learning outcomes:</b> The subject presents a selection of specific topics from the comprehensive theory of management issues with regard to the specifics management in health care. It gives students the basic knowledge, which the medical staff – and pharmacist too – should be theoretically recognize and practically apply in their manager position. Content of subject includes basic management functions, such as planning, organizing, control, motivation and leadership style, discusses the specifics of management practices in the pharmaceutical and healthcare as well as the basic marketing function in public pharmacy. Subject provides students a foundation for their future management work in different areas of health and pharmacy. Theoretical findings are discussed by practical demonstration in the seminars (presentation and discussion, case studies, management games).	
<b>Class syllabus:</b> <ol style="list-style-type: none"> <li>1. General theory of Management, management terminology, managers.</li> <li>2. Management as process.</li> <li>3. Functions of Management – organizing, planning, controlling.</li> <li>4. Motivation and leadership.</li> <li>5. Health Management and its specifics.</li> <li>6. Quality Management.</li> <li>7. Management practices in pharmacy, communication and business ethics.</li> <li>8. Patient's Management. Patient Empowerment.</li> <li>9. Pharmaceutical market. Stakeholders and customers related management. SWOT analysis.</li> <li>10. Marketing – strategy, planning, marketing mix.</li> <li>11. Marketing in public pharmacy.</li> <li>12. Communication mix of pharmaceutical products. Public Relations, Advertisement and ethics.</li> <li>13. Human Resource Management.</li> </ol>	
<b>Recommended literature:</b>	

1. Peterson A.M.: Managing Pharmacy Practice, CRC Press LLC, 2004 2. Buchbinder S.B.: Introduction to Health Care Management, J & B Learning, 2007 3. Quin S.: Management Basic, 2010, ISBN 978-87-7681-717-6 4. Philips A.: Healthcare Management Dictionary, Radcliffe Publishing, 2003. 5. Hogg G.: Managing and Marketing Health Services, Cengage Learning EMEA, 2002					
<b>Languages necessary to complete the course:</b> English language.					
<b>Notes:</b>					
<b>Past grade distribution</b> Total number of evaluated students: 534					
A	B	C	D	E	FX
20,41	17,79	20,04	14,61	23,03	4,12
<b>Lecturers:</b> doc. PharmDr. Daniela Mináriková, PhD., doc. PharmDr. Tomáš Tesař, PhD., MBA, PharmDr. Zuzana Koblišková					
<b>Last change:</b> 30.05.2016					
<b>Approved by:</b>					



## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KFChL/18-Mgr-A/19		<b>Course title:</b> Mathematic for Pharmacists			
<b>Educational activities:</b> <b>Type of activities:</b> lecture / seminar <b>Number of hours:</b> <b>per week:</b> 1 / 2 <b>per level/semester:</b> 14 / 28 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 3					
<b>Recommended semester:</b> 1.					
<b>Educational level:</b> I.II.					
<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: 14					
A	B	C	D	E	FX
21,43	21,43	0,0	14,29	21,43	21,43
<b>Lecturers:</b> doc. Ing. Vladimír Frečer, DrSc.					
<b>Last change:</b>					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KFChL/09-Mgr-A/00		<b>Course title:</b> Mathematics			
<b>Educational activities:</b> <b>Type of activities:</b> practicals / lecture / seminar <b>Number of hours:</b> <b>per week:</b> 0 / 1 / 2 <b>per level/semester:</b> 0 / 14 / 28 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 4					
<b>Recommended semester:</b> 1.					
<b>Educational level:</b> I.II.					
<b>Prerequisites:</b>					
<b>Course requirements:</b>					
<b>Learning outcomes:</b>					
<b>Class syllabus:</b> Algebra – expressions, equations, inequations and methods of their solution. Functions – algebraic and transcendent, properties of functions. Differential calculus – limit and derivative, differential and difference. Progressions and series – arithmetical and geometrical, function approximation. Differential equations and their applications. Statistical analysis of sets and dependencies – mean values, measures of variability, correlation and regression.					
<b>Recommended literature:</b> Stancl D.L., Stancl M.L.: Calculus for management and the life and social sciences, Irwin, Boston 1990 Hoffmann L.D., Barney S.S., Bradley G.L.: Applied calculus for business, economics, and the social and life sciences, Expanded edition, McGraw-Hill Science, 2009					
<b>Languages necessary to complete the course:</b>					
<b>Notes:</b>					
<b>Past grade distribution</b> Total number of evaluated students: 724					
A	B	C	D	E	FX
20,72	9,39	12,71	21,69	28,87	6,63
<b>Lecturers:</b> doc. Ing. Vladimír Frečer, DrSc.					
<b>Last change:</b> 02.06.2015					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KFB/06-Mgr-A/00		<b>Course title:</b> Medicinal Plants			
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 0 / 0 / 2 <b>per level/semester:</b> 0 / 0 / 28 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 2					
<b>Recommended semester:</b> 4.					
<b>Educational level:</b> I.II.					
<b>Prerequisites:</b>					
<b>Course requirements:</b> Scale of assessment (preliminary/final): 20/80					
<b>Learning outcomes:</b>					
<b>Class syllabus:</b> Particular interest in the course Medicinal Plants and to their organs that constitute herbal drugs. Other topics are the field production of important domestic species as well as the possibility of introduction of selected foreign taxa to island conditions, with respect to practical needs.					
<b>Recommended literature:</b> Vaverkova S. et al.: Botany and medicinal plants. Bratislava UK, 1995, 106 pages Burnie G. et al.: Botanica. Gordon Cheers, Publ. Random Australia, 1998, 920 page					
<b>Languages necessary to complete the course:</b>					
<b>Notes:</b>					
<b>Past grade distribution</b> Total number of evaluated students: 522					
A	B	C	D	E	FX
71,65	21,46	3,83	0,57	0,0	2,49
<b>Lecturers:</b> doc. Ing. Miroslav Habán, PhD., Mgr. Ondrej Ďuriška, PhD.					
<b>Last change:</b> 02.06.2015					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KBMBL/11-Mgr-A/19	<b>Course title:</b> Microbiology
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 2 / 1 / 0 <b>per level/semester:</b> 28 / 14 / 0 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 5	
<b>Recommended semester:</b> 1.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Recommended prerequisites:</b> Biology.	
<b>Course requirements:</b> All laboratory practices completed by reports, running evaluation by a preliminary test (successful in at least 60 %) and final examination (combined test with oral).	
<b>Learning outcomes:</b> By passing through the subject the student acquires the basic knowledge of the world of microorganisms, and their role in infectious diseases, as well as their application in pharmacy.	
<b>Class syllabus:</b> Structure, physiology, biochemistry and genetics of bacterial cell. Comprehensive virology. Interaction of microorganisms with their environment, particularly with host organism. Pathogenicity and infection. Pathogenic bacteria, viruses, fungi and protozoa. Types and mode of action of antibiotics and other antimicrobial agents. Prophylactic vaccines. Mechanisms of bacterial resistance to antimicrobial drugs. Disinfection, sterilization and preservation. Utilization of microorganisms in pharmacy. Ecology of microorganisms in pharmaceutical settings. Microbial contamination of pharmaceutical products and its control.	
<b>Recommended literature:</b> Denyer S. P., Hodges N. A, Gorman S. P.: Hugo & Russell's Pharmaceutical Microbiology, 7th Ed., Blackwell, Oxford 2005, ISBN 0-632-06467-6 - Slonczewski J. L., Foster J. W.: Microbiology. Norton, New York 2009, ISBN 978-0-393-97857-5 Talaro K.P., Chess B.: Foundations in Microbiology, 8th Ed., McGraw Hill, New York 2012, ISBN 978-0-07-131673-6.	
<b>Languages necessary to complete the course:</b> English language.	

<b>Notes:</b>					
<b>Past grade distribution</b> Total number of evaluated students: 60					
A	B	C	D	E	FX
6,67	20,0	10,0	16,67	35,0	11,67
<b>Lecturers:</b> Mgr. Eva Drobná, PhD., doc. Mgr. Martina Hřčka Dubníčková, PhD., doc. Mgr. Andrea Bilková, PhD., PharmDr. Hana Kiňová Sepová, PhD., PharmDr. Gabriela Greifová, PhD.					
<b>Last change:</b> 23.08.2019					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KBMBL/11-Mgr-A/00	<b>Course title:</b> Microbiology
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 2 / 1 / 0 <b>per level/semester:</b> 28 / 14 / 0 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 4	
<b>Recommended semester:</b> 3.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Recommended prerequisites:</b> Biology.	
<b>Course requirements:</b> All laboratory practices completed by reports, running evaluation by a preliminary test (successful in at least 60 %) and final examination (combined test with oral).	
<b>Learning outcomes:</b> By passing through the subject the student acquires the basic knowledge of the world of microorganisms, and their role in infectious diseases, as well as their application in pharmacy.	
<b>Class syllabus:</b> Structure, physiology, biochemistry and genetics of bacterial cell. Comprehensive virology. Interaction of microorganisms with their environment, particularly with host organism. Pathogenicity and infection. Pathogenic bacteria, viruses, fungi and protozoa. Types and mode of action of antibiotics and other antimicrobial agents. Prophylactic vaccines. Mechanisms of bacterial resistance to antimicrobial drugs. Disinfection, sterilization and preservation. Utilization of microorganisms in pharmacy. Ecology of microorganisms in pharmaceutical settings. Microbial contamination of pharmaceutical products and its control.	
<b>Recommended literature:</b> Denyer S. P., Hodges N. A, Gorman S. P.: Hugo & Russell's Pharmaceutical Microbiology, 7th Ed., Blackwell, Oxford 2005, ISBN 0-632-06467-6 - Slonczewski J. L., Foster J. W.: Microbiology. Norton, New York 2009, ISBN 978-0-393-97857-5 Talaro K.P., Chess B.: Foundations in Microbiology, 8th Ed., McGraw Hill, New York 2012, ISBN 978-0-07-131673-6.	
<b>Languages necessary to complete the course:</b> English language.	

<b>Notes:</b>					
<b>Past grade distribution</b>					
Total number of evaluated students: 613					
A	B	C	D	E	FX
6,36	9,62	18,11	15,01	42,25	8,65
<b>Lecturers:</b> Mgr. Eva Drobná, PhD., doc. Mgr. Martina Hřčka Dubníčková, PhD., doc. Mgr. Andrea Bilková, PhD., PharmDr. Hana Kiňová Sepová, PhD., PharmDr. Gabriela Greifová, PhD.					
<b>Last change:</b> 13.04.2016					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KFCh/08-Mgr-A/00	<b>Course title:</b> Molecular Basis of Drug Development
<b>Educational activities:</b> <b>Type of activities:</b> practicals / lecture / seminar <b>Number of hours:</b> <b>per week:</b> 1 / 1 / 1 <b>per level/semester:</b> 14 / 14 / 14 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 4	
<b>Recommended semester:</b> 6.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Recommended prerequisites:</b> KFCH/05-Mgr.-A/00 Pharmaceutical chemistry I.	
<b>Course requirements:</b> Final Assessment: written final examination. The evaluation of exam: 100 – 90 % (evaluation level A), 89 – 80 % (B), 79 – 70 % (C), 69 – 60 % (D), 59 – 50 % (E), less than 50 % (FX, not passed). Scale of assessment (preliminary/final): 0 / 100	
<b>Learning outcomes:</b> To provide an introduction on drug actions and development, the pharmaceutical chemistry and pharmacological activity of drugs acting on lipids, proteins (receptors), enzymes, nucleic acids. QSAR, biotransformation of drugs.	
<b>Class syllabus:</b> The main objective of the subject is to provide new knowledge to students in the field of molecular basics of drug development, focusing mainly on methods of drug design (classical procedures, rational methods, chemical and biological information systems in the field of drug design, structure-activity relationships, methods of molecular modeling and molecular graphics), drug targets (proteins, enzymes, receptors, nucleic acids, lipids), drug-receptor interaction (thermodynamic, kinetic and structural analysis of drug-receptor interaction) and drug development(development of drugs from natural sources, synthetic analogs, receptor theories, 3D structure aided drug development, computer-aided drug development (CADD)). This subject is a part of pharmaceutical chemistry - its general part, whose methods and principles are generally applicable in drug development in any therapeutic group.	
<b>Recommended literature:</b> Text Books (latest edition): An Introduction to Medical Chemistry, Graham L. Patrick. Principles of Medicinal Chemistry, W.O. Foye, T. L. Lemke, David A Williams. Medicinal Chemistry. Principles and Practice. (F. D. King. Ed)	
<b>Languages necessary to complete the course:</b> English.	



<b>Notes:</b> -					
<b>Past grade distribution</b> Total number of evaluated students: 88					
A	B	C	D	E	FX
19,32	7,95	17,05	9,09	4,55	42,05
<b>Lecturers:</b> PharmDr. Vladimír Garaj, PhD., Ing. Stanislava Šoralová, PhD.					
<b>Last change:</b> 18.02.2020					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KBMBL/12-Mgr-A/00		<b>Course title:</b> Molecular Biology of Drug Effects			
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 2 / 1 / 0 <b>per level/semester:</b> 28 / 14 / 0 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 4					
<b>Recommended semester:</b> 5.					
<b>Educational level:</b> I.II.					
<b>Prerequisites:</b>					
<b>Course requirements:</b> 100% participation on all forms of education. The final exam has a writing form and for successful completion it is necessary to obtain minimal 60%.					
<b>Learning outcomes:</b>					
<b>Class syllabus:</b> The flow of genetic information – the influencing possibilities of drugs: replication, transcription, translation and posttranslation 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 proteinkinases and integration of signal processing. Transport processes in the cell. Principles of the DNA recombinant technology. Principles of gene manipulations.					
<b>Recommended literature:</b> Lectures. Elliott W.H., Elliott D.C.: Biochemistry and Molecular Biology. 4th ed. Oxford University Press 2009. Rudge M.S., Patterson C.: Principles of Molecular Medicine, Humana Press, 2006, 2nd ed.					
<b>Languages necessary to complete the course:</b> English language.					
<b>Notes:</b>					
<b>Past grade distribution</b> Total number of evaluated students: 197					
A	B	C	D	E	FX
16,24	11,68	18,27	22,84	27,41	3,55
<b>Lecturers:</b> RNDr. František Bilka, PhD., Mgr. Ivana Holková, PhD., doc. PharmDr. Marek Obložinský, PhD., Ing. Ľudmila Pašková, PhD., PharmDr. Andrea Balažová, PhD.					
<b>Last change:</b> 02.06.2015					

**Approved by:**

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KFB/07-Mgr-A/00		<b>Course title:</b> Natural Remedies			
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 2 / 1 / 0 <b>per level/semester:</b> 28 / 14 / 0 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 4					
<b>Recommended semester:</b> 6.					
<b>Educational level:</b> I.II.					
<b>Prerequisites:</b>					
<b>Course requirements:</b> Scale of assessment (preliminary/final): 20/80					
<b>Learning outcomes:</b>					
<b>Class syllabus:</b> Lectures include only issues of prospective medicinal plants which are not involved in the subject Pharmacognosy (2), for example antiviral, hypoglycaemic, antiprotozoics, Alzheimer's disease therapeutics, influence of hormonal balance. Discussed are the latest findings of research and development based on traditional medicinal plant sources of non-European origin. Contents of the laboratory practices include qualitative analyses of industrially produced remedies containing plant metabolites, chromatographic analyses of possible substitutions of selected pharmacopoeial drugs, correlation of drugs polyphenol content with their antioxidant activity.					
<b>Recommended literature:</b> Journals: Phytochemistry, Journal of Natural Products, Planta Medica, Journal of Ethnopharmacology, Phytotherapy Research, Free Radical Biology and Medicine. European Pharmacopoeia 7th Edition.					
<b>Languages necessary to complete the course:</b>					
<b>Notes:</b>					
<b>Past grade distribution</b> Total number of evaluated students: 97					
A	B	C	D	E	FX
26,8	15,46	8,25	12,37	7,22	29,9
<b>Lecturers:</b> doc. PharmDr. Szilvia Czigle, PhD., Mgr. Jaroslav Tóth, PhD., PharmDr. Vladimír Forman, PhD.					
<b>Last change:</b> 02.06.2015					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KFANF/08-Mgr-A/00	<b>Course title:</b> New Trends in Analytical Chemistry
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 1 / 2 / 0 <b>per level/semester:</b> 14 / 28 / 0 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 4	
<b>Recommended semester:</b> 5.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> Scale of assessment (preliminary/final): 30/70	
<b>Learning outcomes:</b>	
<b>Class syllabus:</b> One of the most important role of analytical chemistry in relation to the pharmaceutical control practice is the elaboration and application of modern analytical methods for the quality and quantity evaluation of drugs, analysis of multicomponent mixtures, monitoring of concentration levels of drugs and their degradation products in biological materials. Trends in analytical chemistry should allow for the essential theoretical knowledge and experimental skill for students. The crux of the elective subject Trends in analytical chemistry is laid on the modern instrumental analysis methods with an emphasis on the possibilities of their utilization. Here, the analysis of drugs, multicomponent inorganic analysis of essential and toxic elements in the particular branches of environment (air, soil, plants, water) and the monitoring of drugs and their metabolites in biological fluids are highlighted. The laboratory practices are aimed at the utilization of modern instrumental techniques – the radionuclide X-ray fluorescence analysis (RRFA), atomic absorption spectroscopy (AAS), electrochemical dissolving analysis, nuclear magnetic resonance (NMR), infrared (IR) spectrometry (interpretation of drug spectra), selected separation methods (high performance liquid chromatography, HPLC, gas chromatography, GC, capillary electrophoresis, CE) – mainly in the trace analysis. Obviously, the knowledge and experience obtained after passing this subject are advantageously utilized by students in their MSc. Thesis as well as in the postgraduate study (PhD.). <b>Syllabus:</b> <ul style="list-style-type: none"> <li>• Sample preparation procedures for the analysis of drugs, biological material and environmental components.</li> <li>• Electrochemical methods: New trends in the theory and instrumentation in the field of electrochemical analytical methods.</li> <li>• Biosensors and current trends of their utilization.</li> <li>• Spectral methods, classification.</li> <li>• X-ray fluorescence analysis – new pharmacopeial method and its utilization in pharmacy.</li> </ul>	

- X-ray fluorescence analysis - Determination of selected elements in pharmaceutical formulations and biological samples.
- UV-VIS absorption spectrometry, Fluorescence spectrometry and current trends of their utilization.
- Utilization of IR spectra for the drug identification.
- Fundamentals of NMR spectroscopy, interpretation of NMR spectra, analytical application of NMR.
- Mass spectrometry and current trends of their utilization.
- Separation methods, classification.
- Modern liquid chromatography and its utilization in pharmacy.
- Progress in the field of capillary electromigration methods – ITP, CZE.
- Separation and determination of biologically important compounds and their enantiomers by capillary electrophoresis.
- New trends in hyphenated separation methods.
- Validation of advanced analytical methods.

**Recommended literature:**

Mikuš, P., Maráková, K.: Hyphenated electrophoretic techniques in advanced analysis.  
Bratislava : KARTPRINT, 2012. 217 s. (vedecká monografia)

**Languages necessary to complete the course:**

**Notes:**

**Past grade distribution**

Total number of evaluated students: 483

A	B	C	D	E	FX
26,92	8,49	19,67	15,73	28,99	0,21

**Lecturers:** prof. RNDr. Peter Mikuš, PhD.

**Last change:** 08.06.2017

**Approved by:**

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KChTL/04-Mgr-A/00	<b>Course title:</b> Organic Chemistry (1)
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 2 / 3 / 1 <b>per level/semester:</b> 28 / 42 / 14 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 7	
<b>Recommended semester:</b> 2.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> Seminars: The student is required during the semester to complete all the seminars. During the course each student must write 4 interim tests (0-20 points) and 1 review test (0-40 points). To fulfill the conditions for the examination the student has to reach more than 50% of the total point score of all tests. The points reached within the seminars are multiplied by the factor of 0,3 and their value is 30% of the exam value in case of a successful completion of the exam. The coefficient obtained from the seminars applies solely to the academic year in which it was obtained. Laboratory exercises: The student is required during the semester to complete all laboratory exercises. According to the study programme, he/she has to write one test from the laboratory techniques (0-40 points) and independently perform four synthetic tasks (0-10 points). To fulfill the conditions needed for the examination the student has to reach more than 50% of the total point score from the laboratory exercises. Gained points are then multiplied by the factor of 0,1 and their value is 10% of the exam value in case of a successful completion of the exam. Examination: The course examinations are held exclusively in written form during the examination period. Participation at the exam is subject to the full completion of the seminars and laboratory exercises programme and equisition of more than 50% of the total point score from the seminars and more than 50% of the total point score from the laboratory exercises. The written examination consists of two parts, A and B. Successful completion of the test is conditional on obtaining more than 50% from each section of the written test. At the successful completion the test's average point value obtained from both parts is multiplied by the factor of 0,6. The total mark of the exam is created by the value obtained from seminars (30%), laboratory exercises (10%) and the examination test (60%). Grading scale of the overall result of the exam (after taking into account the outcome of the interim control): A: 87,01 % – 100,00 %; B: 77,01 % – 87,00 %; C: 67,01 % – 77,00 %; D: 57,01 % – 67,00 %; E: 50,01 % – 57,00 %; Fx: ≤ 50,00 %. Scale of assessment (preliminary/final): 30+10/60	
<b>Learning outcomes:</b> 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, such as Organic Chemistry 2, and are also needed for the pharmaceutically	

oriented courses, e.g. Pharmaceutical Chemistry. The course is comprehensively designed, focusing on Master Degree accredited study programme of Pharmacy.

**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 formation, to the development and significance of conjugated and aromatic systems, and, first and foremost in terms of reactivity and behavior in biological systems. It puts the emphasis on their importance in chemistry of pharmaceuticals and other following chemical courses of the pharmaceutical study. Mastering the knowledge of theoretical teaching and their application is the subject of seminars. The modern element in the course teaching is the use of computer technology to molecular modeling of the type organic molecules and molecules of certain medicinal products, as well as the possibility of continuation in elective courses - Principles of Molecular Modeling and Selected Chapters in Organic Chemistry. The aim of practical exercises is to manage the laboratory techniques and organic synthesis, including the identification of products by determining the fundamental constants and evaluation of the results of measurements of physical methods according to the SL-1. The course of Organic Chemistry 1 is one of the fundamental courses in a comprehensive chemical preparation of students of pharmacy. When teaching the subject emphasis is laid on the use of acquired knowledge of organic chemistry in pharmacy and medicine. The course is comprehensively designed, focusing on Master Degree accredited study programme of Pharmacy.

**Recommended literature:**

1. Devínsky F. et al. Organic Chemistry for Pharmacy Students. Comenius University Press, Bratislava, 2010
2. Čižmáriková R.: Laboratory manual for practice in organic chemistry. Comenius University Press, Bratislava, 2012

**Languages necessary to complete the course:**

English language

**Notes:**

The course is held only in summer semester.

Teachers: Assoc. prof. RNDr. Ružena Čižmáriková, CSc.; Assoc. prof. PharmDr. Miloš Lukáč, PhD.; Natalia Miklášová, PhD.; Assoc. prof. PharmDr. Jindra Valentová, PhD.

**Past grade distribution**

Total number of evaluated students: 692

A	B	C	D	E	FX
4,62	11,27	25,14	36,42	13,29	9,25

**Lecturers:** doc. PharmDr. Jindra Valentová, PhD., doc. PharmDr. Miloš Lukáč, PhD., Mgr. Natalia Lucia Miklášová, PhD., Mgr. Lucia Lintnerová, PhD., Ing. Ladislav Habala, PhD.

**Last change:** 20.09.2017

**Approved by:**



## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KChTL/05-Mgr-A/00	<b>Course title:</b> Organic Chemistry (2)
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 2 / 0 / 2 <b>per level/semester:</b> 28 / 0 / 28 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 5	
<b>Recommended semester:</b> 3.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Recommended prerequisites:</b> Recommendation: Organic Chemistry 1	
<b>Course requirements:</b> Seminars: The student is required during the semester to complete all the seminars. During the course each student must write 3 interim tests (0-20 points) and 1 review test (0-40 points). To fulfill the conditions for the examination the student is to reach more than 50% of the total point value of all the tests. The points reached within the seminars are multiplied by the factor of 0,4 and their value is 40% of the exam value in case of a successful completion of the exam. The coefficient obtained from the seminars applies solely to the academic year in which it was obtained. Examination: The course examinations are held exclusively in written form in the examination period. Participation at the exam is subject to the full completion of the seminars and equisition of more than 50% of the total point score from the seminars. It is required to pass the exam from Organic Chemistry 1. The written examination consists of two parts, A and B. Successful completion of the test is conditional on obtaining more than 50% from each section of the written test. At the successful completion the test's average point value obtained from both parts is multiplied by the factor of 0,6. The total mark of the exam is created by the value obtained from seminars (40%) and the examination test (60%). Grading scale of the overall result of the exam (after taking into account the outcome of the interim control): A: 87,01 % – 100,00 %; B: 77,01 % – 87,00 %; C: 67,01 % – 77,00 %; D: 57,01 % – 67,00 %; E: 50,01 % – 57,00 %; Fx: ≤ 50,00 %. Scale of assessment (preliminary/final): 40/60	
<b>Learning outcomes:</b> 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 skills are necessary for the completion of further chemical and also pharmaceutically oriented courses, such as Pharmaceutical Chemistry. The course is comprehensively designed, focusing on Master Degree accredited study programme of Pharmacy.	
<b>Class syllabus:</b> In theoretical teaching the main attention is 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. Mastering the knowledge of theoretical teaching and their application is the subject of seminars. The course of Organic Chemistry 2 is one of the fundamental courses in a comprehensive chemical preparation of students of pharmacy. When teaching the subject emphasis is placed on the use of acquired knowledge of organic chemistry in pharmacy and medicine. The course is comprehensively designed, focusing on Master Degree accredited study programme of Pharmacy.

**Recommended literature:**

1. Devínsky F. et al. Organic Chemistry for Pharmacy Students. Comenius University Press, Bratislava, 2010
2. McMurry, J.W., Begley, T.P.: The Organic Chemistry of biological Pathways, W. H. Freeman, 2nd ed., 2015
3. Čižmáriková R.: Laboratory manual for practice in organic chemistry. Comenius University Press, Bratislava, 2012

**Languages necessary to complete the course:**

English language

**Notes:**

The course is held only in winter semester.

Teachers: Assoc. prof. RNDr. Ružena Čižmáriková, CSc., Assoc. prof. PharmDr. Miloš Lukáč, PhD., Natalia Miklášová, PhD., Assoc. prof. Jindra Valentová, PhD.

**Past grade distribution**

Total number of evaluated students: 645

A	B	C	D	E	FX
3,1	10,08	25,89	32,09	12,25	16,59

**Lecturers:** doc. PharmDr. Jindra Valentová, PhD., doc. PharmDr. Miloš Lukáč, PhD., Mgr. Natalia Lucia Miklášová, PhD.

**Last change:** 28.09.2017

**Approved by:**

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KBMBL/13-Mgr-A/00	<b>Course title:</b> Pathobiochemistry
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 2 / 1 / 0 <b>per level/semester:</b> 28 / 14 / 0 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 4	
<b>Recommended semester:</b> 5.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> Assessment: examination /written test + oral examination/. Conditions: 1. Attendance of all practical exercises and seminars. 2. Preparation of protocols from all practical exercises. 3. Summary achievement of at least 60% from tests. The conditions of the preliminary evaluation will be specified in practical exercises. Information about the conditions for the participation on the first date of the final exam will be specified by separate announcement.	
<b>Learning outcomes:</b> After attending the course student will receive informations about the causes of changes in metabolism of main biochemical substrates of different diseases, molecular basis of inflammatory processes and biochemical and molecular basis of malignat processes. In laboratories the student will acquire the skills for determination of clinical-biochemical parameters, especially enzymes, isoenzymes and markers important for diagnosis of diseases. Attending the course is necessary for understanding of molecular basis of pathobiochemistry processes.	
<b>Class syllabus:</b> - Characterization of disorders of metabolic pathways of main biological substrates as a response to pathological processes. - Disorders of regulation of glucose and glycogen metabolism, biochemical picture of diabetes mellitus. - Disorders of lipid metabolism, production of ketone bodlies. - Lipoproteines: transport form of lipids, regulation of cholesterol metabolism, dyslipoproteinemias, metabolism of sphingolipids and lipidosis. - Disorders of protein digestion, absorption of aminoacids, proteolytic enzymes, disorders of aminoacids metabolism. - Disorders of synthesis and degradation of purine and pyrimidine nucleotides, Lesch-Nyhan syndrome. - Disorders of heme metabolism, porphyrias, hemoglobinopathias, metabolism of bilirubin. - Enzymes in diagnosis of diseases, molecular diseases and hereditary enzymes deficiency.	

<ul style="list-style-type: none"> <li>- Disorders of water metabolism, acidobasic balance and mineral metabolism.</li> <li>- Biochemical principles of inflammation, the role of free radicals and mediators in inflammatory process.</li> <li>- Biochemical and molecular principles of malignant processes and specific markers.</li> </ul>					
<b>Recommended literature:</b> Lieberman M., Marks A.D. (2009): Basic Medical Biochemistry, A Clinical Approach. Wolters Kluwer/Lippincott Williams and Wilkins, Philadelphia, 3th edition. Gaw A. et al. (2006): Clinical Biochemistry. Churchill Livingstone, 3th edition, Reprint. Baynes J., Dominiczak M.H. (2004): Medical Biochemistry. Mosby International, New York.					
<b>Languages necessary to complete the course:</b> English language.					
<b>Notes:</b>					
<b>Past grade distribution</b> Total number of evaluated students: 588					
A	B	C	D	E	FX
14,8	18,88	27,72	18,88	19,05	0,68
<b>Lecturers:</b> PharmDr. Andrea Balažová, PhD., doc. PharmDr. Marek Obložinský, PhD., RNDr. František Bilka, PhD., Mgr. Ivana Holková, PhD., PharmDr. Renáta Kubíková, PhD., Ing. Ludmila Pašková, PhD., PharmDr. Katarína Šišková, PhD.					
<b>Last change:</b> 24.03.2016					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KFT/13-Mgr-A/00		<b>Course title:</b> Pathology			
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 2 / 2 / 0 <b>per level/semester:</b> 28 / 28 / 0 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 5					
<b>Recommended semester:</b> 3.					
<b>Educational level:</b> I.II.					
<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: 613					
A	B	C	D	E	FX
16,64	16,97	21,53	15,33	20,88	8,65
<b>Lecturers:</b> doc. MUDr. Tatiana Stankovičová, CSc., prof. PharmDr. Ján Klimas, PhD., MPH, PharmDr. Tatiana Foltánová, PhD., PharmDr. Zuzana Kiliánová, PhD., PharmDr. Stanislava Kosírová, PhD., PharmDr. Eva Kráľová, PhD., PharmDr. Tomáš Rajtík, PhD., PharmDr. Adrián Szobi, PhD., doc. PharmDr. Anna Paul Hrabovská, PhD., Mgr. Lenka Bies Piváčková, PhD.					
<b>Last change:</b> 02.06.2015					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KFT/14-Mgr-A/00		<b>Course title:</b> Pathophysiology			
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 2 / 0 / 0 <b>per level/semester:</b> 28 / 0 / 0 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 2					
<b>Recommended semester:</b> 3.					
<b>Educational level:</b> I.II.					
<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: 102					
A	B	C	D	E	FX
12,75	12,75	16,67	13,73	30,39	13,73
<b>Lecturers:</b> PharmDr. Tatiana Foltánová, PhD., doc. MUDr. Tatiana Stankovičová, CSc., prof. PharmDr. Ján Klimas, PhD., MPH, PharmDr. Stanislava Kosírová, PhD., PharmDr. Eva Kráľová, PhD.					
<b>Last change:</b> 02.06.2015					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KFB/03-Mgr-A/00		<b>Course title:</b> Pharmaceutical Botany			
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 2 / 3 / 0 <b>per level/semester:</b> 28 / 42 / 0 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 6					
<b>Recommended semester:</b> 2.					
<b>Educational level:</b> I.II.					
<b>Prerequisites:</b>					
<b>Course requirements:</b> Scale of assessment (preliminary/final): 50/50					
<b>Learning outcomes:</b>					
<b>Class syllabus:</b> Main attention in the field of systematic botany and ecology is paid to basic taxonomical units with respect to diacritical characteristic of medicinal plants. In the field of plant cytology the course focuses on morphological and functional differences of plant cells and on cell inclusions that present determinant characteristic in plant/drug description. The anatomy of individual types of plant tissues is detail in accordance with their development stage attributes and function. In the field of organology the course focuses on the anatomy and morphology of particular plant tissues with respect to specific characteristics of pharmaceutically important species.					
<b>Recommended literature:</b> Simpson M.: Plant Systematics. Ed.Amsterdam, Elsevier, 2006, 589 pages Weier E., Stocking R., Barbour M.: Botany an Introduction to plant Biology. Ed. Wilez-Sons Publ. Comp. New York, 1984, 693 pages Vaverkova S. et al.: Botany and medicinal plants. Bratislava UK, 1995, 106 pages					
<b>Languages necessary to complete the course:</b>					
<b>Notes:</b>					
<b>Past grade distribution</b> Total number of evaluated students: 702					
A	B	C	D	E	FX
27,07	25,36	22,65	17,24	5,56	2,14
<b>Lecturers:</b> doc. Ing. Miroslav Habán, PhD., Mgr. Ondrej Ďuriška, PhD.					
<b>Last change:</b> 02.06.2015					
<b>Approved by:</b>					

## STATE EXAM DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/500-Mgr-A/15	<b>Course title:</b> Pharmaceutical Chemistry
<b>Number of credits:</b> 4	
<b>Educational level:</b> I.II.	
<b>State exam syllabus:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	



## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KFCh/05-Mgr-A/00	<b>Course title:</b> Pharmaceutical Chemistry (1)
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 2 / 0 / 1 <b>per level/semester:</b> 28 / 0 / 14 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 5	
<b>Recommended semester:</b> 5.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Recommended prerequisites:</b> The KCHTL/01-Mgr-A/00 Organic Chemistry (1), KCHTL/02-Mgr-A/00 Organic Chemistry (2), KFANF/01-Mgr-A/00 Analytical Chemistry (1), KFANF/02-Mgr-A/00 Analytical Chemistry (2), and KBMBL/03-Mgr-A/00 Biochemistry courses are very strongly recommended to be successfully passed.	
<b>Course requirements:</b> Conditions for successful completion of lectures and seminars from the Pharmaceutical Chemistry (1) course: a) Personal attendance at lectures – students are rigorously required to attend to 80% of the lectures; personal attendance at seminars – students are rigorously required to attend to 100% of the seminars. b) Successful course completion based on successful passing of all semestral preliminary tests. To pass all scheduled semestral preliminary tests (2 tests; 2 points per question; 10 points of each test would be reached at maximum), 60% or higher rate must be achieved of each (6 points score or higher of each test is essential). c) Successful course completion based on successful passing of a final (written) exam. The final written exam from Pharmaceutical Chemistry (1) course will last 120 minutes. The exam will consist of a set of 25 questions, in which all intended and lectured pharmacotherapeutic groups will be represented. Each of questions will be evaluated by 2 points. The questions will cover i) knowledge from a field of „general“ Pharmaceutical/Medicinal Chemistry, ii) definitions and „chemical“ classifications (divisions) of particular pharmacological classes, appropriate „chemical“ division of particular compounds iii) mechanisms of action, iv) precise chemical structures of chosen compounds, v) structure-activity relationships in detail, including a general chemical structure the compounds + concrete examples of drugs with precisely drawn chemical structure, and (vi) biotransformation pathways related to the compounds. Evaluation of the exam will be as follows: 50–47 points (evaluation level „A“), 46–44 points („B“), 43–39 points („C“), 38–35 points („D“), 34–30 points („E“), less than 30 points („FX“; not passed). Update: Conditions for Course Completion – COVID-19 Pandemic Situation a) Mandatory Attendance at All Lectures and Seminars Student i) has to attend all lectures from the Pharmaceutical Chemistry (1) course, which will be performed online in the winter semester of the academic year 2020/2021; ii) has to attend all	

seminars from the Pharmaceutical Chemistry (1) course, which will be performed (lectured) online as well.

Lectures from the Pharmaceutical Chemistry (1) course as well as seminars from the Pharmaceutical Chemistry (1) course will be lectured in relevant time (according to valid schedule) in the interactive environment of Microsoft Teams (MS Teams) application.

**b) Study of Lectures and Recommended and Optional Literature**

Texts related to the lectures from the Pharmaceutical Chemistry (1) course will be stored in the MS Teams environment. These texts will cover the syllabus of the lectures published at the website of Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Comenius University in Bratislava. In addition, a student is obliged to study properly other recommended and optional literature sources provided in the Syllabus of Lectures and Syllabus of Seminars document, respectively.

**c) Successful Course Completion Based On Successful Passing of All Semestral Preliminary Evaluations**

To pass successfully all scheduled semestral preliminary evaluations – 2 tests, 60% (or higher percentage) of each test has to be achieved by a student. The preliminary tests from the Pharmaceutical Chemistry (1) course will be in written forms, i.e., students will complete the tests in the Moodle interactive environment.

All requirements listed in a) – c) sections have to be fulfilled completely by a student in order to take an exam from the Pharmaceutical Chemistry (1) course.

**d) Successful Course Completion Based On Successful Passing of a Final (Written) Exam**

Final exam will consist of a set of questions, in which „General“ Pharmaceutical Chemistry and all lectured pharmacotherapeutic groups will be represented (all topics lectured at lectures and seminars as well). The questions will cover i) knowledge from a field of „general“ Pharmaceutical/Medicinal Chemistry; ii) definition particular pharmacological classes and division of relevant compounds; iii) chemical structures of particular compounds; iv) comprehensive structure–activity relationships, and vi) biotransformation (metabolic) pathways related to selected biologically active compounds. Regarding current COVID-19 pandemic situation, a form of the exam from the Pharmaceutical Chemistry (1) course will be specified immediately when receiving relevant instructions from Comenius University in Bratislava.

Scale of assessment (preliminary/final): 0 / 100.

**Learning outcomes:**

The Pharmaceutical/Medicinal Chemistry (the Pharmaceutical Chemistry (1) course) 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: a) fundamental concepts about drugs, receptors, and drug–receptor interactions; b) fundamental concepts about drug–receptor interactions applied to human disease. Pharmaceutical/Medicinal Chemistry is multidisciplinary, drawing on theoretical chemistry, organic chemistry, analytical chemistry, molecular biology, pharmacology, and biochemistry. Despite these complexities, Pharmaceutical/Medicinal Chemistry has a clear „bottom line“ – a design and discovery of drug molecules with a comprehensive definition and characterization of their properties, taking into account i) structural integrity of the drug molecules (in pharmaceutical, pharmacokinetic and pharmacodynamic phases), ii) their structural fragments (pharmacophore, toxicophore, metabophore, biophore; interchangeable bioisosteres), iii) structural properties, iv) physicochemical features (solubility, surface activity, lipophilicity, acid-base properties), v) shape properties (geometric, conformational, topological, steric), vi) stereochemical properties (optical isomers, enantiomers, geometric isomers), vii) electronic properties. Following that knowledge, (quantitative) structure–(biological) activity relationships are comprehensively investigated (SAR, QSAR).

**Class syllabus:**

1st Week: Pharmaceutical Chemistry – General Principles, Current Concepts and Prospectives. Definitions of Terms Used in Pharmaceutical Chemistry (drug, prodrug, drug-like, ligand, receptor, bioavailability, structure–activity relationships (SAR), quantitative structure–activity relationships (QSAR), biotransformation, etc.).

Classification of Drugs. Basic Principles in Lead (Drug) Development and Optimization (including some strategies of the optimization). Some Requirements for an „Ideal“ Drug.

The Fate of a Drug in the Body (pharmaceutical, pharmacokinetic and pharmacodynamic aspects)

2nd Week: Ligand–Biomacromolecule Interactions, part 1. Types of Interactions Between Ligand and Receptor; Definitions of Some Fundamental Terms (bioactive structural part of a drug, pharmacophore, metabophore, toxicophore, etc.); Enzymes; Interactions Between a Ligand and Enzyme; Interactions Between Ligand and Nucleic Acid, Orthosteric and Allosteric Interactions; Allosteric Modulators (examples of drugs); Interactions from a Chemical Point of View (interactions involved in molecular recognition, non-bonded interactions, i.e., hydrogen bonding, ionic interactions, van der Waals interactions, interactions CH– $\pi$ , interactions cation– $\pi$ , hydrophobic interactions, metal chelation interactions, halogen bonding; all issues explained using examples of drugs from various pharmacotherapeutic groups)

3rd Week: Ligand–Biomacromolecule Interactions, part 2. Covalent Interactions; Covalent Bonds; Comparison of Non-Covalent, Irreversible Covalent and Reversible Covalent Inhibitors; Design of Covalent Drugs – Inhibitors; Potential Benefits and Risks Associated with Covalent Inhibitors; Mechanism of Covalent Bond Formation Between a Ligand and Effector Site (all issues explained using examples of drugs from various pharmacotherapeutic groups); Types of Reactive Functional Groups (irreversible covalent inhibitors, reversible covalent inhibitors); Covalent Inhibitors used in Therapeutic Practice

4th Week: Prodrugs; Definition of Some Fundamental Terms; Prodrug Concepts; Basics of Prodrug Design; Purpose of Designing Prodrugs; Classification of Prodrugs; Optimization of Bioavailability (all issues explained using examples of drugs from various pharmacotherapeutic groups); Advantages of Prodrugs with Optimized Pharmacokinetic Properties. Some Newly Approved Drugs

Stereochemical Aspects of Drug Development; Definition of Some Fundamental Terms (isomers, enantiomers, diastereoisomers, stereogenic centre, etc.); Importance of Stereochemical Properties of Drugs for Their Biological Activity (all issues explained using examples of drugs from various pharmacotherapeutic groups)

Hybrid Molecules, the Privileged Scaffold for Various Pharmaceuticals. Ideal Hybrid Drug Molecules' Characteristics; Different Strategies of Hybrid Design (all issues explained using examples of drugs from various pharmacotherapeutic groups); Some Hybrid Drugs in Clinical Practice; Brief Introduction into Structure–Activity Relationships within Some Pharmacotherapeutic Classes of Drugs

5th Week: General Anesthetics; Sedatives; Hypnotics; Anticonvulsant Drugs (Definitions, mechanisms of action, systematic „chemical“ classification, chemical structures of chosen drugs, structure–activity relationships + general chemical structure + chemical structure of particular compounds, biotransformation)

6th Week: Psychoactive Drugs, part 1. – Psycholeptic Drugs. Neuroleptics; Anxiolytics (Definitions, mechanisms of action, systematic „chemical“ classification, chemical structures of chosen drugs, structure–activity relationships + general chemical structure + chemical structure of particular compounds, biotransformation)

7th Week: Psychoactive Drugs, part 2. – Psychoanaleptic Drugs. Antidepressants; Psychostimulants; Nootropics (Definitions, mechanisms of action, systematic „chemical“

classification, chemical structures of chosen drugs, structure–activity relationships + general chemical structure + chemical structure of particular compounds, biotransformation)

Psychoactive Drugs, part 3. – Psychodysleptic Drugs. Psychedelics (Definitions, mechanisms of action, systematic „chemical“ classification, chemical structures of chosen drugs, structure–activity relationships + general chemical structure + chemical structure of particular compounds, biotransformation)

8th Week: Antiparkinsonian Drugs; Emetic Agents; Antiemetic Drugs; Antivomitics (Definitions, mechanisms of action, systematic „chemical“ classification, chemical structures of chosen drugs, structure–activity relationships + general chemical structure + chemical structure of particular compounds, biotransformation)

9th Week: Analgesics. Centrally-Acting (Opioid) Analgesics; Analgesics–Antipyretics; Drugs for the Treatment of Migraine (Definitions, mechanisms of action, systematic „chemical“ classification, chemical structures of chosen drugs, structure–activity relationships + general chemical structure + chemical structure of particular compounds, biotransformation)

10th Week: Non-Steroidal Anti-Inflammatory Drugs (Definitions, mechanisms of action, systematic „chemical“ classification, chemical structures of chosen drugs, structure–activity relationships + general chemical structure + chemical structure of particular compounds, biotransformation)

11th Week: Local Anesthetics; Muscle Relaxants (Definitions, mechanisms of action, systematic „chemical“ classification, chemical structures of chosen drugs, structure–activity relationships + general chemical structure + chemical structure of particular compounds, biotransformation)

12th Week: Adrenergics; Antiadrenergics; Antiarrhythmic Agents (Definitions, mechanisms of action, systematic „chemical“ classification, chemical structures of chosen drugs, structure–activity relationships + general chemical structure + chemical structure of particular compounds, biotransformation)

13th Week: Parasympathomimetics; Parasympatholytics; Spasmolytics; Antihistamine Drugs (Definitions, mechanisms of action, systematic „chemical“ classification, chemical structures of chosen drugs, structure–activity relationships + general chemical structure + chemical structure of particular compounds, biotransformation)

#### **Recommended literature:**

Alagarsamy, V. (2010). Textbook of Medicinal Chemistry. Volume I. Elsevier, New Delhi, India, 561 pp.

Alagarsamy, V. (2012). Textbook of Medicinal Chemistry. Volume II. Elsevier, New Delhi, India, 547 pp.

Beale, J. M., & Block, J. H. (2011). Wilson and Gisvold's Textbook of Organic Medicinal and Pharmaceutical Chemistry. 12th Ed. Wolters Kluwer Health (Lippincott Williams & Wilkins), Philadelphia, United States of America, 1022 pp.

Chackalamannil, S., Rotella, D., Ward, S. (2017). Comprehensive Medicinal Chemistry III, 3rd Ed. Elsevier, Amsterdam, Netherlands, 4536 pp.

Patrick, G. L. (2017). An Introduction to Medicinal Chemistry. 6th Ed. Oxford University Press, New York, United States of America, 832 pp.

Pearson, P. G., & Wienkers, L. C. (2019). Handbook of Drug Metabolism. 3rd Ed. (Drugs and the Pharmaceutical Sciences). CRC Press, New York, USA, 616 pp.

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

Silverman, R.B., Holladay, M.W. (2015). The Organic Chemistry of Drug Design and Drug Action. 3rd Ed. Academic Press (Elsevier), San Diego, United States of America, 536 pp.

Strømgaard, K., Krogsgaard-Larsen, P., & Madsen, U. (2016). Textbook of Drug Design and Discovery. 5th Ed. CRC Press, Taylor & Francis Group, Boca Raton, FL, United States of America, 541 pp.

Wermuth, C., Aldous, D., Raboisson, P., & Rognan, D. (2015). The Practice of Medicinal Chemistry. 4th Ed. Academic Press is imprint of Elsevier, San Diego, CA, United States of America; Kidlington, Oxford, United Kingdom, 903 pp.

**Languages necessary to complete the course:**

English.

**Notes:**

**Past grade distribution**

Total number of evaluated students: 594

A	B	C	D	E	FX
18,35	23,74	29,97	16,67	9,26	2,02

**Lecturers:** doc. PharmDr. Ivan Malík, PhD., PharmDr. Jana Čurillová, PhD.

**Last change:** 14.09.2020

**Approved by:**

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KFCh/06-Mgr-A/00	<b>Course title:</b> Pharmaceutical Chemistry (2)
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 2 / 5 / 0 <b>per level/semester:</b> 28 / 70 / 0 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 7	
<b>Recommended semester:</b> 6.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Recommended prerequisites:</b> Recommendation. The FaF.KCHTL/01-Mgr-A/00 Organic Chemistry (1), FaF.KCHTL/02-Mgr-A/00 Organic Chemistry (2), FaF.KBMBL/03-Mgr-A/00 Biochemistry and FaF.KFCH/05-Mgr-A/00 Pharmaceutical Chemistry (1) courses have been very strongly recommended to be successfully passed for the Pharmaceutical Chemistry (2) course completion.	
<b>Course requirements:</b> The conditions for a successful completion of Lectures and Laboratory Practices from the Pharmaceutical Chemistry (2) course considering current epidemic situation a) Attendance at Lectures and Laboratory Practices, Study of Lectures Student is obliged to complete all lectures and all laboratory practices as essential parts of the Pharmaceutical Chemistry (2) course. Texts of the lectures from the Pharmaceutical Chemistry (2) course will be continuously sent to students, the texts will be stored in the interactive MS Teams application. These texts will cover syllabus of lectures published at the website of Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Comenius University in Bratislava as well as in the MS Teams application. b) Successful Course Completion Based On Successful Passing of All Semestral Preliminary Evaluations Regarding current COVID-19 pandemic situation, 1st as well as 2nd preliminary evaluation (test) from Pharmaceutical Chemistry (2) will be performed by an interactive moodle application. All students are obliged to sign in to the Pharmaceutical Chemistry (2) course. Content of both preliminary evaluations (tests) will be covered by lectured themes (Lectures, Laboratory Practices). Details related to the evaluations (focusing on particular pharmacotherapeutic classes) will be communicated to students within the lectures from Pharmaceutical Chemistry (2). For passing all the scheduled semestral preliminary evaluations (2 tests), 60% or higher rate of each test must be achieved. c) Successful Course Completion Based On Successful Passing of a Final (Written) Exam All exam terms will be listed in AIS-2 as well as in the moodle environment. The examination in the Pharmaceutical Chemistry (2) course will be in a written form, i.e., students will complete the test in the moodle interactive environment.	

The final written exam will consist of the questions, in which all lectured pharmacotherapeutic classes (from Lectures as well as Laboratory Practices) will be represented. The questions will cover i) definitions and classifications (division) of particular pharmacological classes, ii) chemical structures of particular compounds, iii) mechanism of biological (pharmacological) action mentioned briefly, iv) structure–activity relationships and (if possible) structure–toxicity relationships in detail, respectively, and vi) biotransformation pathways related to the compounds.

The questions will be evaluated by:

one (1) point (questions related to the division of particular pharmacotherapeutic classes and „chemical characterization“ of particular compounds, respectively), or by

two (2) points (questions connected with structure–activity relationships, structure–toxicity relationships and biotransformation pathways of some compounds, respectively).

The terms (date and time) for a final exam will be registered via AIS-2.

Students are obliged to sign in to the Pharmaceutical Chemistry (2) final exam (to a specific term) via AIS-2.

The final exam will be performed via moodle environment as in cases of preliminary evaluations.

Only a student who is properly registered via the AIS-2 electronic system and who is signed properly in the Pharmaceutical Chemistry (2) course in the moodle system, will be allowed to take the exam.

For the final written exam, unlimited number of students can be registered, however, 2 days before the exam date at the latest. In addition, the students are allowed to be unregistered, however, 2 days before the exam date at the latest.

Evaluation of the exam will be as follows:

Evaluation „A“: 100.00%–94.00%,

Evaluation „B“: 93.99%–88.00%,

Evaluation „C“: 87.99%–80.00%,

Evaluation „D“: 79.99%–71.00%,

Evaluation „E“: 70.99%–60.00%,

Evaluation „FX“ (not passed): less than 60.00%.

Scale of assessment (preliminary/final): 0 / 100

### **Learning outcomes:**

Pharmaceutical/Medicinal Chemistry (the Pharmaceutical Chemistry (2) course) is a science unto itself, a central science positioned to provide a molecular bridge between the basic science of biology and the clinical science of medicine (analogous to chemistry being the central science between the traditional disciplines of biology and physics). From a very broad perspective, a drug design may be divided into two phases: a) fundamental concepts about drugs, receptors, and drug–receptor interactions; b) basic concepts about drug–receptor interactions applied to human disease. Pharmaceutical/Medicinal Chemistry is multidisciplinary, drawing on theoretical chemistry, organic chemistry, analytical chemistry, molecular biology, pharmacology, and biochemistry. Despite these complexities, Pharmaceutical/Medicinal Chemistry has a clear „bottom line“ – the design and discovery of drug molecules with a comprehensive definition and characterization of their properties, taking into account i) a structural integrity of the drug molecules (in pharmaceutical, pharmacokinetic and pharmacodynamic phases), ii) their structural fragments (pharmacophore, toxicophore, metabophore; interchangeable bioisosteres), iii) structural properties, iv) physicochemical features (solubility, surface activity, lipophilicity, acid-base properties), v) shape properties (geometric, conformational, topological, steric), vi) stereochemical properties (optical isomers, enantiomers, geometric isomers), vii) electronic properties. Following that knowledge, structure–(biological) activity relationships are comprehensively investigated.

### **Class syllabus:**

Lectures

1ST WEEK: Drugs Influencing a Cardiovascular System. Cardiotonics, Cardiotonics. Vasodilating Agents (Definitions, mechanisms of action, systematic „chemical“ division, chemical structures of some compounds, „structure–activity“ relationships, biotransformation pathways)

2ND WEEK: Antihypertensives. Drugs Influencing Veins (Definitions, mechanisms of action, systematic „chemical“ division, chemical structures of some compounds, „structure–activity“ relationships, biotransformation pathways)

3RD WEEK: Drugs Regulating Blood Coagulation Processes. Blood Substitutes. Lipid-Lowering Drugs – Treatment of Hypercholesterolemia. Treatment of Hypertriglyceridemia (Definitions, mechanisms of action, systematic „chemical“ division, chemical structures of some compounds, „structure–activity“ relationships, biotransformation pathways)

4TH WEEK: Hepatoprotective Agents. Diuretics, Anti-Diuresis Drugs. Ligands of Vasopressin Receptors (Definitions, mechanisms of action, systematic „chemical“ division, chemical structures of some compounds, „structure–activity“ relationships, biotransformation pathways)

5TH WEEK: Preliminary Evaluation I. Anthelmintics. Isecticidal Agents (Definitions, mechanisms of action, systematic „chemical“ division, chemical structures of some compounds, „structure–activity“ relationships, biotransformation pathways)

6TH WEEK: Cystic Fibrosis. Emerging Cystic Fibrosis Transmembrane Conductance Regulator Modulators as New Drugs for Cystic Fibrosis (Definitions, mechanisms of action, systematic „chemical“ division, chemical structures of some compounds, „structure–activity“ relationships, biotransformation pathways)

7TH WEEK: Antifungal Drugs. Anti-Protozoal Agents (Definitions, mechanisms of action, systematic „chemical“ division, chemical structures of some compounds, „structure–activity“ relationships, biotransformation pathways)

8TH WEEK: Antimalarial Drugs. Anti-Tuberculosis Drugs. Anti-Leprosy Drugs (Definitions, mechanisms of action, systematic „chemical“ division, chemical structures of some compounds, „structure–activity“ relationships, biotransformation pathways)

9TH WEEK: Antibacterial Chemotherapeutics/Antibiotics, part 1. beta-Lactam Antibiotics (Definitions, mechanisms of action, systematic „chemical“ division, chemical structures of some compounds, „structure–activity“ relationships, biotransformation pathways)

10TH WEEK: Preliminary Evaluation II. Antibacterial Chemotherapeutics/Antibiotics, part 2. Diaminopyrimidines. Quinolones (Gyrase Inhibitors). Nitrofurans (Definitions, mechanisms of action, systematic „chemical“ division, chemical structures of some compounds, „structure–activity“ relationships, biotransformation pathways)

11TH WEEK: Antiviral Agents (Definitions, mechanisms of action, systematic „chemical“ division, chemical structures of some compounds, „structure–activity“ relationships, biotransformation pathways)

12TH WEEK: Cytostatics, part 1. Alkylating Agents. Compounds Forming Complexes with DNA. Compounds Generating Reactive Entities. Antimetabolites. Protein Synthesis Inhibitors. Antimitotic Drugs (Definitions, mechanisms of action, systematic „chemical“ division, chemical structures of some compounds, „structure–activity“ relationships, biotransformation pathways)

13TH WEEK: Cytostatics, part 2. Angiogenesis Inhibitors. Inhibitors of Histone Deacetylases and Other Protein Deacetylases. Inhibitors of Histone Methyltransferases (Definitions, mechanisms of action, systematic „chemical“ division, chemical structures of some compounds, „structure–activity“ relationships, biotransformation pathways)

#### **Recommended literature:**

Aminov, R. (2017). History of antimicrobial drug discovery: Major classes and health impact. *Biochemical Pharmacology*, Volume 133, 4–19.

Abraham, D.J., & Rotella, D.P. (2010). *Burger's Medicinal Chemistry and Drug Discovery*, 8 Volume Set. 7th Ed. Wiley, Hoboken, NY, United States of America, 6416 pp.



Avendaño, C., & Menéndez, J.C. (2015). Medicinal Chemistry of Anticancer Drugs. 2nd Ed. Elsevier, Amsterdam, the Netherlands; Elsevier, Kidlington, Oxford, United Kingdom; Elsevier, Waltham, MA, United States of America, 744 pp.

Chackalamannil, S., Rotella, D., & Ward, S. (2017). Comprehensive Medicinal Chemistry III, 3rd Ed. Elsevier, Amsterdam, Netherlands, 4536 pp.

Desai, M.C., Meanwell, N.A., Thurston, D.E., Ganellin, R., Fox, D., Guccione, S., Martinez, A., Rotella, D., Belema, M., Sperandio, D., Shi, P.-Y., Jordan, R., Halcomb, R., Roberts, Ch., Johns, B.A., Griffin, S., Beaulieu, P.L., McCauley, J.A., Sofia, M., Xu, L., Guyer, B., & Peel, M.R. (2013). Successful Strategies for the Discovery of Antiviral Drugs: RSC (Drug Discovery). Drug Discovery Series No. 32, Royal Society of Chemistry, Cambridge, United Kingdom, 533 pp.

Firestine, S.M., Lister, T., Abel-Santos, E., Hedstrom, L., Melander, Ch., Fisher, S., Khursigara, C., Lazarides, L., Garneau-Tsodikova, S., & Balibar, C.J. (2017). Antibiotic Drug Discovery: New Targets and Molecular Entities. 1st Ed., Kindle Ed. Drug Discovery Series No. 58, Royal Society of Chemistry, Cambridge, United Kingdom, 285 pp.

Patrick, G.L. (2017). An Introduction to Medicinal Chemistry. 6th Ed. Oxford University Press, New York, USA, 832 pp.

Wermuth, C., Aldous, D., Raboisson, P., & Rognan, D. (2015). The Practice of Medicinal Chemistry. 4th Ed. Academic Press (Elsevier), San Diego, CA, USA; Kidlington, Oxford, Great Britain, 903 pp

**Languages necessary to complete the course:**

English

**Notes:**

**Past grade distribution**

Total number of evaluated students: 577

A	B	C	D	E	FX
31,37	18,54	23,22	13,34	11,96	1,56

**Lecturers:** doc. PharmDr. Ivan Malík, PhD., PharmDr. Jana Čurillová, PhD., PharmDr. Zuzana Štiffelová

**Last change:** 18.02.2021

**Approved by:**

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KORF/06-Mgr-A/00		<b>Course title:</b> Pharmaceutical Informatics			
<b>Educational activities:</b> <b>Type of activities:</b> lecture / seminar <b>Number of hours:</b> <b>per week:</b> 1 / 2 <b>per level/semester:</b> 14 / 28 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 4					
<b>Recommended semester:</b> 4.					
<b>Educational level:</b> I.II.					
<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: 472					
A	B	C	D	E	FX
20,55	6,99	27,97	9,11	26,69	8,69
<b>Lecturers:</b> doc. PharmDr. Tomáš Tesař, PhD., MBA					
<b>Last change:</b> 02.06.2015					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KFChL/17-Mgr-A/19		<b>Course title:</b> Pharmaceutical Physics (1)			
<b>Educational activities:</b> <b>Type of activities:</b> practicals / lecture <b>Number of hours:</b> <b>per week:</b> 2 / 2 <b>per level/semester:</b> 28 / 28 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 5					
<b>Recommended semester:</b> 1.					
<b>Educational level:</b> I.II.					
<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: 63					
A	B	C	D	E	FX
3,17	17,46	20,63	22,22	17,46	19,05
<b>Lecturers:</b> RNDr. Alexander Búcsi, PhD., doc. RNDr. Jana Gallová, CSc., RNDr. Tomáš Fazekaš, PhD., Mgr. Lukáš Hubčík, PhD., Mgr. Mária Klacsová, PhD.					
<b>Last change:</b>					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KFChL/19-Mgr-A/19		<b>Course title:</b> Pharmaceutical Physics (2)			
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 2 / 2 / 0 <b>per level/semester:</b> 28 / 28 / 0 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 5					
<b>Recommended semester:</b> 2.					
<b>Educational level:</b> I.II.					
<b>Prerequisites:</b>					
<b>Course requirements:</b>					
<b>Learning outcomes:</b>					
<b>Class syllabus:</b> The subject Physical chemistry is aimed on the following fields: Structure of matter and grounds of spectral methods (UV-VIS, fluorescence, IR, Raman, NMR spectroscopy). Chemical thermodynamics – fundamental laws, phase equilibrium, solutions and liquid mixtures, condensed systems. Electrochemistry – solvents and solutions of electrolytes, strong and weak electrolytes, acid- base equilibrium, ampholytes, potentiometry. Chemical kinetics – reaction rates and orders, diffusion and kinetics of heterogeneous processes, rate of dissolution. Colloids and surfaces – surface phenomena, adsorption, membranes and membrane phenomena. The lectures from physical chemistry are supplemented by practical exercises, where the students verify their theoretical knowledge in practice.					
<b>Recommended literature:</b> Atkins, P. W.: Physical Chemistry, 6th edition, Oxford University Press, 1998 Connors, K. A.: Thermodynamics of Pharmaceutical Systems : an Introduction for Students of Pharmacy. Hoboken : Wiley Interscience, 2002. 344 s. Amiji M.M., Sandmann B.J.: Applied Physical Pharmacy. New York : McGraw-Hill, 2003. 462 s. Laboratory Manual for Physical Chemistry, compiled by teachers of the Department of Physical Chemistry of Drugs.					
<b>Languages necessary to complete the course:</b>					
<b>Notes:</b>					
<b>Past grade distribution</b> Total number of evaluated students: 57					
A	B	C	D	E	FX
0,0	1,75	17,54	17,54	36,84	26,32

<b>Lecturers:</b> prof. RNDr. Daniela Uhríková, CSc., doc. Ing. Vladimír Frečer, DrSc., Ing. Jarmila Oremusová, CSc., RNDr. Tomáš Fazekas, PhD., Mgr. Tomáš Kondela, RNDr. Alexander Búcsi, PhD., Mgr. Lukáš Hubčík, PhD., PharmDr. Gilda Liskayová, PhD.
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<b>Last change:</b> 11.09.2019
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<b>Approved by:</b>
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## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KORF/07-Mgr-A/00		<b>Course title:</b> Pharmaceutical Propaedeutics			
<b>Educational activities:</b> <b>Type of activities:</b> practicals / lecture / seminar <b>Number of hours:</b> <b>per week:</b> 0 / 2 / 0 <b>per level/semester:</b> 0 / 28 / 0 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 2					
<b>Recommended semester:</b> 1.					
<b>Educational level:</b> I.II.					
<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: 769					
A	B	C	D	E	FX
29,91	8,97	18,6	12,35	27,7	2,47
<b>Lecturers:</b> doc. PharmDr. Tomáš Tesař, PhD., MBA					
<b>Last change:</b> 02.06.2015					
<b>Approved by:</b>					

## STATE EXAM DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/600-Mgr-A/15	<b>Course title:</b> Pharmaceutical Technology
<b>Number of credits:</b> 4	
<b>Educational level:</b> I.II.	
<b>State exam syllabus:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KGF/05-Mgr-A/00	<b>Course title:</b> Pharmaceutical Technology (1)
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 4 / 5 / 0 <b>per level/semester:</b> 56 / 70 / 0 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 10	
<b>Recommended semester:</b> 7.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Recommended prerequisites:</b> KFCHL/08-Mgr-A/00 Physical Chemistry, KFANF/02-Mgr-A/00 Analytical Chemistry (2) KFB/05-Mgr-A/00 Pharmacognosy (2); KFCH/06-Mgr-A/00 Pharmaceutical Chemistry (2)	
<b>Course requirements:</b> Assessment through a written examination, for successful completion at least 70 %. Assessment A: 95-100%, B: 88-94%, C: 82-87%, D: 76-81%, E: 70-75%. Scale of assessment (preliminary/final): 20/80	
<b>Learning outcomes:</b> By passing the course, the student will have a complex theoretical knowledge of the drugs as dispersion and application systems and practical experience with the preparation of dosage forms.	
<b>Class syllabus:</b> Medicines have dosage form which is given by the necessity of their administration and coexistence of present drugs and additives (pharmaceutical ingredients). Pharmaceutical technology (galenics) is a field of pharmaceutical science dealing with the design and formulation of medicines (dosage form design), the manufacture of these medicines on both a small (compounding) and a large (pharmaceutical technology) scale, evaluation and safety of the medicines. It studies the conditions how drugs and additives (pharmaceutical ingredients) can be converted into medicines, then the regularities which rule the relations between medicines and the effect of administered drugs. In compliance with the given definition of the subject of pharmaceutical technology as a science and as educational discipline "Pharmaceutical technology" concerns these fields: # Drug Technology, biotechnology # The drug as a dispersion and an application system # Systematic classification of the drugs and dosage forms # Technological procedures and equipments for the preparation and production of the drugs # Pharmaceutical adjuvants - excipients # Colloidal dispersion systems, lyophobic and lyophilic colloids # Dispersion system liquid in liquid and solid in liquid # Preparations obtained by extraction methods # Liquid preparations for oral use # Preparations for inhalation	



# Parenteral preparations - injections, infusions – production, use # Parenteral controlled release drug delivery systems # Eye and nasal preparations # Liposomes and microemulsion as a new drug delivery systems					
<b>Recommended literature:</b> Aulton, M. E.: Aulton's Pharmaceutics: the design and manufacture of medicines. Edinburgh: Churchill Livingstone, 2007 European Pharmacopoeia 8 th Ed. Strasbourg: EDQM, 2013 Lectures from Pharmaceutical technology Tichý E., Starýchová L., Čuchorová M.: Solid dosage forms – Laboratory practices, Bratislava UK, 2015					
<b>Languages necessary to complete the course:</b> English					
<b>Notes:</b>					
<b>Past grade distribution</b> Total number of evaluated students: 574					
A	B	C	D	E	FX
9,58	15,33	19,34	24,74	29,97	1,05
<b>Lecturers:</b> PharmDr. Alžbeta Lengyelová, PharmDr. Desana Matušová, PhD., PharmDr. Eduard Tichý, PhD., PharmDr. Katarína Bauerová, DrSc., PharmDr. Veronika Šimunková, PhD., PharmDr. Milica Molitorisová, PhD., RNDr. Klára Gardavská, CSc., PharmDr. Mária Raučinová, PhD., Mgr. Jana Selčanová, PharmDr. Terézia Haršányová, PharmDr. Veronika Mikušová, PhD., Ing. Mária Zajičková, PhD.					
<b>Last change:</b> 11.05.2016					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KGF/06-Mgr-A/00	<b>Course title:</b> Pharmaceutical Technology (2)
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 4 / 5 / 0 <b>per level/semester:</b> 56 / 70 / 0 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 10	
<b>Recommended semester:</b> 8.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Recommended prerequisites:</b> KFCHL/08-Mgr-A/00 Physical Chemistry, KFANF/02-Mgr-A/00 Analytical Chemistry (2) KFB/05-Mgr-A/00 Pharmacognosy (2); KFCH/06-Mgr-A/00 Pharmaceutical Chemistry (2)	
<b>Course requirements:</b> Assessment through an oral examination. Scale of assessment (preliminary/final): 30/70	
<b>Learning outcomes:</b> By passing the course, the student will have a complex theoretical knowledge of the drugs as dispersion and application systems and practical experience with the preparation of dosage forms.	
<b>Class syllabus:</b> Medicines have dosage form which is given by the necessity of their administration and coexistence of present drugs and additives (pharmaceutical ingredients). Pharmaceutical technology (galenics) is a field of pharmaceutical science dealing with the design and formulation of medicines (dosage form design), the manufacture of these medicines on both a small (compounding) and a large (pharmaceutical technology) scale, evaluation and safety of the medicines. It studies the conditions how drugs and additives (pharmaceutical ingredients) can be converted into medicines, then the regularities which rule the relations between medicines and the effect of administered drugs. In compliance with the given definition of the subject of pharmaceutical technology as a science and as educational discipline "Pharmaceutical technology" concerns these fields: # Semisolids preparations for cutaneous application # Rectal and vaginal preparations # Transdermal therapeutic systems # Solid preparations for oral administration (granules, tablets, coated tablets, capsules) # Controlled release drug delivery systems targeting # Drug microforms # Drug liberation from dosage forms, release kinetics, absorption # Biopharmacy, mechanism of the transport across biological membranes, bioavailability # Stability and stabilization of the preparations # Quality assurance in drug production # Pharmaceutical packaging materials	

<b>Recommended literature:</b> Aulton, M. E.: Aulton's Pharmaceutics: the design and manufacture of medicines. Edinburgh: Churchill Livingstone, 2007 European Pharmacopoeia 9 th Ed. Strasbourg: EDQM, 2013 Lectures from Pharmaceutical technology Tichý E., Starýchová L., Čuchorová M.: Solid dosage forms – Laboratory practices, Bratislava UK, 2015					
<b>Languages necessary to complete the course:</b> English					
<b>Notes:</b>					
<b>Past grade distribution</b> Total number of evaluated students: 551					
A	B	C	D	E	FX
10,71	19,42	22,87	20,33	22,14	4,54
<b>Lecturers:</b> PharmDr. Desana Matušová, PhD., PharmDr. Eduard Tichý, PhD., PharmDr. Katarína Bauerová, DrSc., PharmDr. Alžbeta Lengyelová, PharmDr. Veronika Šimunková, PhD., PharmDr. Miroslava Špaglová, PhD., PharmDr. Veronika Mikušová, PhD.					
<b>Last change:</b> 09.05.2018					
<b>Approved by:</b>					

## STATE EXAM DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/700-Mgr-A/15	<b>Course title:</b> Pharmacognosy
<b>Number of credits:</b> 4	
<b>Educational level:</b> I.II.	
<b>State exam syllabus:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KFB/04-Mgr-A/00		<b>Course title:</b> Pharmacognosy (1)			
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 2 / 3 / 0 <b>per level/semester:</b> 28 / 42 / 0 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 6					
<b>Recommended semester:</b> 5.					
<b>Educational level:</b> I.II.					
<b>Prerequisites:</b>					
<b>Recommended prerequisites:</b> FaF.KFB/03-Mgr-A/00 - Pharmaceutical Botany and FaF.KChTL/05-Mgr-A/00 - Organic Chemistry (2) and FaF.KFANF/02-Mgr-A/00 - Analytical Chemistry (2) and FaF.KBMBL/03-Mgr-A/00 - Biochemistry and FaF.KFANF/01-Mgr-A/00 - Analytical Chemistry (1)					
<b>Course requirements:</b> Scale of assessment (preliminary/final): 10/90					
<b>Learning outcomes:</b>					
<b>Class syllabus:</b> During lectures the students become familiar with parts of existing pharmacognostical pharmacopoeial monographs with particular plant sources of medicinal substances, with the biogenesis of primary and secondary plant metabolites, their function and significance in the plant body, systems of classification and characteristics of each group of secondary metabolites in terms of their chemical properties. Students will gain an overview of drug use and its main biologically active substances that can be part of mass-produced phytopharmaceuticals. The content of macroscopic and microscopic analysis forms practical exercises with anatomical and morphological characteristics of drugs, drug recognition as macroscopic components of tea mixtures and microscopic identification of the diacritical characteristics.					
<b>Recommended literature:</b> Nagy, M. et al.: Teaching texts from Pharmacognosy. European Pharmacopoeia 7th Edition.					
<b>Languages necessary to complete the course:</b>					
<b>Notes:</b>					
<b>Past grade distribution</b> Total number of evaluated students: 587					
A	B	C	D	E	FX
16,18	15,67	26,24	21,12	19,42	1,36

<b>Lecturers:</b> prof. PharmDr. Pavel Mučaji, PhD., prof. Ing. Milan Nagy, CSc., doc. PharmDr. Szilvia Czigele, PhD., doc. PharmDr. Silvia Bittner Fialová, PhD., Mgr. Jaroslav Tóth, PhD., PharmDr. Antonios Koutsoulas, PharmDr. Vladimír Forman, PhD., PharmDr. Zuzana Scheerová Kontšeková, PhD.
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<b>Last change:</b> 13.09.2017
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<b>Approved by:</b>
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## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KFB/05-Mgr-A/00		<b>Course title:</b> Pharmacognosy (2)			
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 2 / 5 / 0 <b>per level/semester:</b> 28 / 70 / 0 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 8					
<b>Recommended semester:</b> 6.					
<b>Educational level:</b> I.II.					
<b>Prerequisites:</b>					
<b>Recommended prerequisites:</b> FaF.KFB/04-Mgr-A/00 - Pharmacognosy (1)					
<b>Course requirements:</b> Scale of assessment (preliminary/final): 10/90					
<b>Learning outcomes:</b>					
<b>Class syllabus:</b> Students shall receive informations related to the classification of drugs according to their pharmacological effects, or use in the prevention and treatment of diseases, including basic information on side effects and interactions with the participation of individual active ingredients of natural origin. The emphasis is on drugs and their active substances, which are part of phytopharmaceuticals registered in EU countries, or which are recorded in the current issue of the European Pharmacopoeia. During the chemical part of practical exercises, students are familiarized with the test methodologies of selected pharmacopoeial drugs and with the identification and determination of active substances. They also work out basic procedures of extraction and isolation of substances from plant material with emphasis on chromatographic methods.					
<b>Recommended literature:</b> Nagy M., Mučaji P.: Pharmacognosy. Natural remedies. FPharm CU 2002, 70 p. Mučaji P., Nagy, M.: Pharmacognosy. Analytical and chromatographic practice. FPharm CU 2001, 44 p.					
<b>Languages necessary to complete the course:</b>					
<b>Notes:</b>					
<b>Past grade distribution</b> Total number of evaluated students: 567					
A	B	C	D	E	FX
19,93	22,75	30,51	14,29	5,82	6,7

**Lecturers:** prof. Ing. Milan Nagy, CSc., prof. PharmDr. Pavel Mučaji, PhD., doc. PharmDr. Szilvia Czige, PhD., doc. PharmDr. Silvia Bittner Fialová, PhD., Mgr. Jaroslav Tóth, PhD., PharmDr. Antonios Koutsoulas, PharmDr. Vladimír Forman, PhD., PharmDr. Zuzana Scheerová Kontšeková, PhD.

**Last change:** 13.09.2017

**Approved by:**



## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KFChL/16-Mgr-A/16	<b>Course title:</b> Pharmacokinetic modelling and drug development
<b>Educational activities:</b> <b>Type of activities:</b> lecture / seminar <b>Number of hours:</b> <b>per week:</b> 2 / 1 <b>per level/semester:</b> 28 / 14 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 4	
<b>Recommended semester:</b> 8.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> During semester students will pass 2 written tests worth 15 points each. During the examination another written test worth 50 points will be given, followed by an oral examination. Points from seminar tests and current examination test will be added together. To obtain the grade A students need to collect a total of at least 65 test points, to obtain grade B at least 60 points, to obtain grade C at least 55 points, to obtain grade D at least 50 points. To obtain grade E a total of at least 40 points is needed.	
<b>Learning outcomes:</b> The course is suitable for students of Pharmacy program who are aiming to pursue a research carrier. Students will hear about mathematical models of disposition kinetics of chemicals in the body and will master physicochemical principles of relationships between pharmacokinetic profile and molecular structure of potential drugs. After passing the course the students will be familiar with methods of determination and in silico prediction of transport properties of drugs. They will obtain a broader picture of the complex issue of research and optimization of properties of compounds undergoing pharmaceutical development. The student will be able to use the acquired skills in drug discovery programs.	
<b>Class syllabus:</b> Phenomenological approach to transport and fate of a drug in the organism. Principles and mathematical models of kinetics of absorption, disposition and biological effect of a drug. Pharmacokinetic compartmental models of distribution based on the physiology of human body. Kinetic parameters and their significance in drug design. Methods for prediction of physicochemical properties and kinetic parameters of bioactive compounds from their molecular structure. Optimization of biological screening tests and interpretation of experimental data.	
<b>Recommended literature:</b> M. Boroujerdi: Pharmacokinetics: Principles and Applications, McGraw-Hill, New York, NY, U.S.A., 2002. E. H. Kerns, L. Di: Drug-like Properties: Concepts, Structure Design and Methods, Elsevier, Burlington, MA, U.S.A., 2008. G. Keserü, D. C. Swinney: Thermodynamics and Kinetics of Drug Binding, Vol. 65, Series: Methods and Principles in Medicinal Chemistry, Wiley-VCH Verlag, Weinheim, Germany, 2015. G. L. Patrick: An Introduction to Medicinal Chemistry, 5th Ed., Oxford University Press, Oxford, UK, 2013.	

<b>Languages necessary to complete the course:</b> English					
<b>Notes:</b> The capacity of the course is restricted to 10 - 15 students. Priority will be given to students with better grades (superior weighted study average determined according to the Study Code of the Faculty of Pharmacy). Please consult the teacher before signing up for this course.					
<b>Past grade distribution</b> Total number of evaluated students: 20					
A	B	C	D	E	FX
90,0	5,0	5,0	0,0	0,0	0,0
<b>Lecturers:</b> doc. Ing. Vladimír Frečer, DrSc.					
<b>Last change:</b> 19.07.2016					
<b>Approved by:</b>					

## STATE EXAM DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/800-Mgr-A/15	<b>Course title:</b> Pharmacology
<b>Number of credits:</b> 4	
<b>Educational level:</b> I.II.	
<b>State exam syllabus:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KFT/08-Mgr-A/00		<b>Course title:</b> Pharmacology and Toxicology (1)			
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 2 / 3 / 0 <b>per level/semester:</b> 28 / 42 / 0 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 8					
<b>Recommended semester:</b> 6.					
<b>Educational level:</b> I.II.					
<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: 577					
A	B	C	D	E	FX
3,99	15,77	35,7	26,17	16,29	2,08
<b>Lecturers:</b> Mgr. Peter Vavrínek, PhD., Mgr. Diana Vavrincová, PhD., doc. PharmDr. Peter Křenek, PhD., doc. PharmDr. Marek Mátuš, PhD., prof. PharmDr. Ján Klimas, PhD., MPH, PharmDr. Zuzana Kiliánová, PhD., PharmDr. Adrián Szobi, PhD., doc. PharmDr. Anna Paul Hrabovská, PhD.					
<b>Last change:</b> 02.06.2015					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KFT/09-Mgr-A/00		<b>Course title:</b> Pharmacology and Toxicology (2)			
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 4 / 3 / 0 <b>per level/semester:</b> 56 / 42 / 0 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 6					
<b>Recommended semester:</b> 7.					
<b>Educational level:</b> I.II.					
<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: 571					
A	B	C	D	E	FX
14,36	19,61	23,47	21,19	18,21	3,15
<b>Lecturers:</b> prof. RNDr. Magdaléna Kuželová, CSc., prof. PharmDr. Ján Klimas, PhD., MPH, PharmDr. Elena Ondriašová, CSc., doc. PharmDr. Peter Křenek, PhD., doc. PharmDr. Marek Máťuš, PhD., Mgr. Diana Vavrincová, PhD., Mgr. Peter Vavrínek, PhD., PharmDr. Zuzana Kiliánová, PhD., doc. PharmDr. Anna Paul Hrabovská, PhD.					
<b>Last change:</b> 02.06.2015					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KTV/01-Mgr-A/19		<b>Course title:</b> Physical Education and Sport (1)			
<b>Educational activities:</b> <b>Type of activities:</b> practicals <b>Number of hours:</b> <b>per week:</b> 2 <b>per level/semester:</b> 28 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 1					
<b>Recommended semester:</b> 1.					
<b>Educational level:</b> I.II.					
<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					
A	B	C	D	E	FX
60,66	14,75	6,56	0,0	1,64	16,39
<b>Lecturers:</b> Mgr. Lenka Nagyová, PhD., PaedDr. Martina Tibenská, PhD., Mgr. Dalibor Ludvig, PhD., Mgr. Michal Tokár, PhD.					
<b>Last change:</b> 24.08.2019					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KTV/02-Mgr-A/19		<b>Course title:</b> Physical Education and Sport (2)			
<b>Educational activities:</b> <b>Type of activities:</b> practicals <b>Number of hours:</b> <b>per week:</b> 2 <b>per level/semester:</b> 28 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 1					
<b>Recommended semester:</b> 2.					
<b>Educational level:</b> I.II.					
<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: 46					
A	B	C	D	E	FX
76,09	13,04	0,0	0,0	0,0	10,87
<b>Lecturers:</b> Mgr. Lenka Nagyová, PhD., Mgr. Dalibor Ludvig, PhD., PaedDr. Martina Tibenská, PhD., Mgr. Michal Tokár, PhD.					
<b>Last change:</b> 05.09.2019					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KTV/03-Mgr-A/00		<b>Course title:</b> Physical Education and Sport (3)			
<b>Educational activities:</b> <b>Type of activities:</b> practicals / lecture / seminar <b>Number of hours:</b> <b>per week:</b> 2 / 0 / 0 <b>per level/semester:</b> 28 / 0 / 0 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 2					
<b>Recommended semester:</b> 3.					
<b>Educational level:</b> I.II.					
<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: 566					
A	B	C	D	E	FX
48,59	31,1	10,95	3,36	0,35	5,65
<b>Lecturers:</b> PaedDr. Martina Tibenská, PhD., Mgr. Dalibor Ludvig, PhD., Mgr. Lenka Nagyová, PhD., Mgr. Michal Tokár, PhD.					
<b>Last change:</b> 31.05.2017					
<b>Approved by:</b>					



## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KTV/04-Mgr-A/00		<b>Course title:</b> Physical Education and Sport (4)			
<b>Educational activities:</b> <b>Type of activities:</b> practicals / lecture / seminar <b>Number of hours:</b> <b>per week:</b> 2 / 0 / 0 <b>per level/semester:</b> 28 / 0 / 0 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 2					
<b>Recommended semester:</b> 4.					
<b>Educational level:</b> I.II.					
<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: 557					
A	B	C	D	E	FX
54,04	26,21	6,64	4,49	2,87	5,75
<b>Lecturers:</b> Mgr. Lenka Nagyová, PhD., Mgr. Dalibor Ludvig, PhD., PaedDr. Martina Tibenská, PhD., Mgr. Michal Tokár, PhD.					
<b>Last change:</b> 31.05.2017					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KORF/08-Mgr-A/00	<b>Course title:</b> Practice in Community Pharmacy (1)
<b>Educational activities:</b> <b>Type of activities:</b> practice <b>Number of hours:</b> <b>per week:</b> <b>per level/semester:</b> 4t <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 4	
<b>Recommended semester:</b> 8.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Recommended prerequisites:</b> KORF/12- Mgr-A/00 Social Pharmacy and Pharmacoeconomics	
<b>Course requirements:</b> Assessment of students is done electronically during practice and in written form in the end of practice (written assessment is made by pharmacy where the student took practice). The final evaluation is arithmetical average of both, the electronic and written assessment. Grading A: 100-93 %, B: 92-85 %, C: 84-77 %, D: 76-69 %, E: 68-60 %, Fx: 59 % and less.	
<b>Learning outcomes:</b> Getting acquainted with the real pharmacy environment, basic knowledge of the pharmacy's assortment of drugs, mastering of basic pharmaceutical activities under supervision of assigned professional in the pharmacy.	
<b>Class syllabus:</b> Characteristics of medical prescription, pharmaceutical dispensing, assortment of drugs in the pharmacy, handling pharmaceutical software, individually and mass prepared medicines, dispensing care, informing, consulting and counseling activities in providing of pharmaceutical care, selftreatment (drugs dispensed without medical prescription, nutritional additives, additional assortment), medical devices, basic economic knowledge, ethical aspects of the pharmacist's profession, ethical codex of a healthcare professional.	
<b>Recommended literature:</b> 1. Hungman, B.: Healthcare Communication, London, Pharmaceutical Press, 2009, 304 p. 2. Veatch, R.M., Haddad, A.: Case studies in pharmacy ethics, Oxford, Univesity Press, 2008, 331 p. 3. Bissel, P., Traulsen, J.M.: Sociology and pharmacy practice, London, Pharmaceutical Press, 2005, 226 p. 4. Wingfield, J., Badcott, D.: Pharmacy ethics and decision making, London, Pharmaceutical Press, 2007, 313 p. 5. Appelbe, G.E., Wingfield, J.: Dale and Appelbe s Pharmacy Law and Ethics, London, Pharmaceutical Press, 2005, 593 p.	

6. Sexton, J., Nickless G., Green, Ch.: Pharmaceutical Care Made Easy, London, Pharmaceutical Press, 2006, 178 p.
7. Edwards, C., Stillman, P.: Minor Illness or Major Disease? The clinical pharmacist in the community. Fourth edition, London, Pharmaceutical Press, 2006, 285 p.
8. Stephens, M.: Hospital Pharmacy, London, Pharmaceutical Press, 2006, 285 p.
9. Harman, R.J.: Patient Care in Community Practice, London, Pharmaceutical Press, 2002, 203 p.
10. Harman, R.J.: Handbook of Pharmacy Health Education, second edition, London, Pharmaceutical Press, 2001, 299 p.
11. European Pharmacopoeia – Ph. Eur. 8th Edition

**Languages necessary to complete the course:**

English language

**Notes:**

e-Protocol of the practice is a formal evidence of undertaking of the mandatory extent of professional pharmaceutical practice according to Council Directive 85/432/EHS, 85/433/EHS, 2001/19/ES – requirements for study of pharmacy and for recognition of professional qualifications.

One week of practice is a time span characterized by five calendar days with 8 working hours per day.

Time period for the practice is set for a period of 25.04.2016 – 20.05.2016.

**Past grade distribution**

Total number of evaluated students: 501

A	B	C	D	E	FX
94,01	4,99	0,6	0,0	0,0	0,4

**Lecturers:** PharmDr. Ľubica Lehocká, PhD., PharmDr. Miroslava Snopková, PhD.

**Last change:** 30.05.2016

**Approved by:**

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KORF/09-Mgr-A/15	<b>Course title:</b> Practice in Community Pharmacy (2)
<b>Educational activities:</b> <b>Type of activities:</b> practice <b>Number of hours:</b> <b>per week:</b> <b>per level/semester:</b> 20t <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 20	
<b>Recommended semester:</b> 9.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Recommended prerequisites:</b> KORF/12- Mgr-A/00 Social Pharmacy and Pharmacoeconomics, KORF/10- Mgr-A/00 Retail Pharmacy, Legislation and Ethics	
<b>Course requirements:</b> Assessment of students is done electronically during practice and in written form in the end of practice (written assessment is made by pharmacy where the student took practice). The final evaluation is arithmetical average of both, the electronic and written assessment. Grading A: 100-93 %, B: 92-85 %, C: 84-77 %, D: 76-69 %, E: 68-60 %, Fx: 59 % and less.	
<b>Learning outcomes:</b> Getting acquainted with the real pharmacy environment, basic knowledge of the pharmacy's assortment of drugs, mastering of basic pharmaceutical activities under supervision of assigned professional in the pharmacy.	
<b>Class syllabus:</b> Characteristics of medical prescription, pharmaceutical dispensing, assortment of drugs in the pharmacy, handling pharmaceutical software, individually and mass prepared medicines, dispensing care, informing, consulting and counseling activities in providing of pharmaceutical care, self-medication (drugs dispensed without medical prescription, nutritional additives, additional assortment), medical devices, basic economic knowledge, ethical aspects of the pharmacist's profession, ethical codex of a healthcare professional.	
<b>Recommended literature:</b> 1. Hungman, B.: Healthcare Communication, London, Pharmaceutical Press, 2009, 304 p. 2. Veatch, R.M., Haddad, A.: Case studies in pharmacy ethics, Oxford, Univesity Press, 2008, 331 p. 3. Bissel, P., Traulsen, J.M.: Sociology and pharmacy practice, London, Pharmaceutical Press, 2005, 226 p. 4. Wingfield, J., Badcott, D.: Pharmacy ethics and decision making, London, Pharmaceutical Press, 2007, 313 p. 5. Appelbe, G.E., Wingfield, J.: Dale and Appelbe s Pharmacy Law and Ethics, London, Pharmaceutical Press, 2005, 593 p.	

6. Sexton, J., Nickless G., Green, Ch.: Pharmaceutical Care Made Easy, London, Pharmaceutical Press, 2006, 178 p.
7. Edwards, C., Stillman, P.: Minor Illness or Major Disease? The clinical pharmacist in the community. Fourth edition, London, Pharmaceutical Press, 2006, 285 p.
8. Stephens, M.: Hospital Pharmacy, London, Pharmaceutical Press, 2006, 285 p.
9. Harman, R.J.: Patient Care in Community Practice, London, Pharmaceutical Press, 2002, 203 p.
10. Harman, R.J.: Handbook of Pharmacy Health Education, second edition, London, Pharmaceutical Press, 2001, 299 p.
11. European Pharmacopoeia – Ph. Eur. 8th Edition

**Languages necessary to complete the course:**

**Notes:**

e- Protocol of the practice is a formal evidence of undertaking of the mandatory extent of professional pharmaceutical practice according to Council Directive 85/432/EHS, 85/433/EHS, 2001/19/ES – requirements for study of pharmacy and for recognition of professional qualifications.

One week of practice is a time span characterized by five working days with 8 working hours per day. To fulfill the requirements of Council Directive 85/432/EHS, 85/433/EHS, students must complete 120 days of practice with 8 working hours per day.

Time period for the practice is set for a period of 01.08.2015 – 31.12.2015.

**Past grade distribution**

Total number of evaluated students: 493

A	B	C	D	E	FX
32,05	39,55	26,17	2,03	0,2	0,0

**Lecturers:** PharmDr. Ľubica Lehocká, PhD., PharmDr. Miroslava Snopková, PhD.

**Last change:** 30.05.2016

**Approved by:**

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KChTL/10-Mgr-A/00		<b>Course title:</b> Principles of Molecular Modelling			
<b>Educational activities:</b> <b>Type of activities:</b> practicals / lecture / seminar <b>Number of hours:</b> <b>per week:</b> 1 / 1 / 0 <b>per level/semester:</b> 14 / 14 / 0 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 2					
<b>Recommended semester:</b> 4.					
<b>Educational level:</b> I.II.					
<b>Prerequisites:</b>					
<b>Course requirements:</b> interim evaluation: project elaboration final evaluation: project defense and final test Scale of assessment (preliminary/final): 40/60					
<b>Learning outcomes:</b> The course shall notify the students with the basic principles used in the methods of computer aided molecular design (CAMD).					
<b>Class syllabus:</b> Tuition consists of several blocks of lectures and individual work with the computer. To master the subject Principles of Molecular Modeling at a sufficient level, knowledge of the subject Organic Chemistry 1 is required. The students work with the programmes available at the Department of Chemical Theory of Drugs – ALCHEMY, CHEMWIND, RASMOL, CHEMDRAW, WORD, with the use of the INTERNET computer network and available databases (PDB). Primarily they work on the tasks in the field of medicines, such as finding the optimal conformation of the molecule, electron division, the relationship between the structure and properties of a molecule. They learn how to browse the Brookhaven Protein database. During the tuition they shall work out the project the defense of which is part of the exam.					
<b>Recommended literature:</b> Alan Hinchliffe : Molecular Modeling for Beginners, Wiley, 2003.					
<b>Languages necessary to complete the course:</b> English language					
<b>Notes:</b> Teachers: Mgr. Lucia Lintnerová, PhD; Assoc. prof. Ing. Martin Pisárčik, CSc.					
<b>Past grade distribution</b> Total number of evaluated students: 30					
A	B	C	D	E	FX
20,0	23,33	33,33	6,67	10,0	6,67

<b>Lecturers:</b> Mgr. Lucia Lintnerová, PhD., doc. Ing. Martin Pisárčík, CSc., Mgr. Peter Herich, PhD.
<b>Last change:</b> 27.11.2017
<b>Approved by:</b>

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KFChL/13-Mgr-A/19		<b>Course title:</b> Problem solving in Physics (1)			
<b>Educational activities:</b> <b>Type of activities:</b> seminar <b>Number of hours:</b> <b>per week:</b> 2 <b>per level/semester:</b> 28 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 1					
<b>Recommended semester:</b> 1.					
<b>Educational level:</b> I.II.					
<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					
A	B	C	D	E	FX
20,0	33,33	26,67	0,0	0,0	20,0
<b>Lecturers:</b> RNDr. Alexander Búcsi, PhD.					
<b>Last change:</b>					
<b>Approved by:</b>					



## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KFChL/14-Mgr-A/19		<b>Course title:</b> Problem solving in Physics (2)			
<b>Educational activities:</b> <b>Type of activities:</b> seminar <b>Number of hours:</b> <b>per week:</b> 2 <b>per level/semester:</b> 28 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 1					
<b>Recommended semester:</b> 2.					
<b>Educational level:</b> I.II.					
<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: 8					
A	B	C	D	E	FX
25,0	25,0	25,0	25,0	0,0	0,0
<b>Lecturers:</b> doc. Ing. Vladimír Frečer, DrSc.					
<b>Last change:</b>					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KORF/25-Mgr-A/14	<b>Course title:</b> Promoting Public Health
<b>Educational activities:</b> <b>Type of activities:</b> lecture / seminar <b>Number of hours:</b> <b>per week:</b> 2 / 1 <b>per level/semester:</b> 28 / 14 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 4	
<b>Recommended semester:</b> 7.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> Completion of lectures and seminars. Written test. The exam performed by the written test with a minimum threshold of success 55%. The assessment: A = 100-95%, B = 94-85%, C = 84-75%, D = 74-70%, E = 69-60%, FX = 59% and less.	
<b>Learning outcomes:</b> Course will enable to students required specific knowledge of promoting and protecting public health and the health education within the practical implementation of public pharmaceutical service-oriented patient. The student will obtain an overview about active health promotion by healthy lifestyle, the role of nutrition and physical activity in health promotion and disease prevention, about position of dietary supplements as an essential part of pharmaceutical care. Also the student will obtain the basic orientation work with EBM information, learn to work with relevant scientific sources of official and Professional institutions. The interactive training should handle professional communication and counselling with patients in self-medication, focussed on the major health risks of community (obesity, cancer, cardiovascular diseases). In the wider context the subject complements the professional profile of pharmacist as expert about medicines and drugs management, but also as an expert in proactive promotion of primary prevention and health promotion in the provision of pharmaceutical care and for society integration of pharmacist as expert in public health tasks.	
<b>Class syllabus:</b> 1. Public health in Slovakia and Europe – legislation, content, characterisation. The basic mutual principles of health policy and public health. 2. Health education - content and form of implementation. Health promotion and its possibilities in the public pharmaceutical services. 3. Public health and its assessment - basic epidemiological parameters in the selected health problem. 4. Prevention as part of health care - general and in public pharmacies. Prevention of selected civilization diseases (oncological and cardiovascular diseases). 5. Basic principles of nutrition. Biologically active food ingredients and their significance for human health. 6. The pharmacist and his possibilities to influence public lifestyle.	

7. Complementary and alternative medicine as part of health care and pharmaceutical care.
8. Dietary Supplements / (nutraceuticals) - general characteristics, legislative, regulatory market entry, inspection, labelling, availability. Specifics legislation supplements, Food Act and the Codex Alimentarius. Nutrition and health claims.
9. Self-medication and the use of non-prescription medicines (OTC) and dietary supplements. Minimum dispensing pharmacist.
10. Information sources and systems relating to dietary supplements. Search for relevant information, free web and free information resource for pharmacists and the general public.
11. Other areas pharmacist active role in the protection and promotion of health (smoking, alcohol, sexual health).
12. Promotion and protection of health in society. Programs, education and application in practical conditions.

**Recommended literature:**

1. Carter J., Slack M: Pharmacy in Public Health: Basics and Beyond, ASHP 2010
2. Lubotsky BL, Hurd PD, Hanson A: Introduction to Public Health in Pharmacy, Jones & Bartlett Learning, 2008
3. Manson P: Dietary Supplements, Pharmaceutical Press, 2011
4. Talbott SM, Hughes K: The Health Professional's Guide to Dietary Supplements, 2006
5. National Centre for Complementary and Integrative Health
6. Rovers et al: A practical guide to pharmaceutical care - A clinical skills primer, 3rd ed. Am. Pharmacists Ass. 2007
7. Debrincat M: Patient Perspectives to Self-medication: Community Pharmacy, AAP, 2014
8. Material from lectures

**Languages necessary to complete the course:**

English

**Notes:**

**Past grade distribution**

Total number of evaluated students: 36

A	B	C	D	E	FX
75,0	19,44	0,0	5,56	0,0	0,0

**Lecturers:** doc. PharmDr. Daniela Mináriková, PhD.

**Last change:** 30.05.2016

**Approved by:**

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KFANF/09-Mgr-A/00		<b>Course title:</b> Radiopharmaceuticals			
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 2 / 1 / 0 <b>per level/semester:</b> 28 / 14 / 0 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 4					
<b>Recommended semester:</b> 5.					
<b>Educational level:</b> I.II.					
<b>Prerequisites:</b>					
<b>Course requirements:</b> Scale of assessment (preliminary/final): 20/80					
<b>Learning outcomes:</b>					
<b>Class syllabus:</b> <ul style="list-style-type: none"><li>• Radiopharmaceuticals: fundamentals, characteristics, importance</li><li>• Radiation protection</li><li>• Production of radionuclides</li><li>• Dosimetry and radiation detection</li><li>• Effects of ionizing radiation on human organism</li><li>• Preparation and quality control of radiopharmaceuticals</li><li>• Radiopharmaceutical Preparation and European Pharmacopoeia</li><li>• Radiopharmaceuticals in the clinical practice (diagnosis and therapy)</li></ul>					
<b>Recommended literature:</b> SAMPSON, C.B. Textbook of Radiopharmacy. Yverdon: Gordon and Breach Science Publishers, 1994. SAHA, G.P. Fundamentals of Nuclear Pharmacy. New York: Springer, 2010, p.409. Good Radiopharmacy Practice, EANM, the latest version. European Pharmacopoeia. the latest edition. Strasbourg : Council of Europe. SÝKOROVÁ, M., HAVRÁNEK, E. Rádiofarmaká laboratórne cvičenia pre farmaceutov. Bratislava: Univerzita Komenského, 2013					
<b>Languages necessary to complete the course:</b>					
<b>Notes:</b>					
<b>Past grade distribution</b> Total number of evaluated students: 560					
A	B	C	D	E	FX
16,07	27,14	20,36	17,32	17,5	1,61
<b>Lecturers:</b> PharmDr. Mária Bodnár Mikulová, RNDr. Jozef Motyčka					

<b>Last change:</b> 13.08.2020
<b>Approved by:</b>

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KORF/10-Mgr-A/15	<b>Course title:</b> Retail Pharmacy, Legislation and Ethics
<b>Educational activities:</b> <b>Type of activities:</b> lecture / seminar <b>Number of hours:</b> <b>per week:</b> 2 / 2 <b>per level/semester:</b> 28 / 28 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 5	
<b>Recommended semester:</b> 8.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Recommended prerequisites:</b> KORF/12- Mgr-A/00 Social Pharmacy and Pharmacoeconomics	
<b>Course requirements:</b> During semester there will be two written examinations with 100 points each, for grade A it is necessary to score at least 93 points, for grade B at least 85 points, for grade C at least 77 points, for grade D at least 69 points, and for grade E at least 60 points. Student, who scores less than 59 points from either examination will get no credits.	
<b>Learning outcomes:</b> After finishing the study course „Retail Pharmacy“ students must have knowledge and skills in the pharmaceutical care, and understand the overall content of the course, role of retail pharmacy in the pharmaceutical practice, which focuses on work with medicines and their disposing to patients under certain conditions. They will be able to work with a medical prescription and information gained from it and also with information gained from literature and electronic databases. They will understand means of storage of substances and medicines , preparing of individually prepared medicines and basics of control of pharmaceutical raw materials. After successful finishing of this educational process students have to be able to responsibly and efficiently withstand in all aspects of pharmaceutical care.	
<b>Class syllabus:</b> Retail pharmacy is a basic subject of pharmacy that in theoretical and practical way deals with providing of pharmaceutical care to general public. This subject has close connection with subject Social pharmacy. These two subjects are interconnected by basic categories like active substance and medicine and their place in pharmacy, in society, as well as within pharmaceutical care. Social pharmacy – Retail pharmacy as a whole is a study subject at the Faculty for doctoral study and approved specialization program of pharmacy for postgraduate study. Teaching of subject Retail pharmacy is done by means of lectures and seminars. Syllabus of lectures and seminars consists of the following topics: Legislature in retail pharmacy, pharmaceutical operations, controlling, preparatory, dispensing, supplying, administrative, public and hospital pharmacies economies, information and consulting activities. Quality of doctor’s communication with a pharmacist. Development of e-prescribing. Electronic drug card. Document creation and processing.	

**Recommended literature:**

1. Hungman, B.: Healthcare Communication, London, Pharmaceutical Press, 2009, 304 p.
2. Veatch, R.M., Haddad, A.: Case studies in pharmacy ethics, Oxford, Univesity Press, 2008, 331 p.
3. Bissel, P., Traulsen, J.M.: Sociology and pharmacy practice, London, Pharmaceutical Press, 2005, 226 p.
4. Wingfield, J., Badcott, D.: Pharmacy ethics and decision making, London, Pharmaceutical Press, 2007, 313 p.
5. Appelbe, G.E., Wingfield, J.: Dale and Appelbe s Pharmacy Law and Ethics, London, Pharmaceutical Press, 2005, 593 p.
6. Sexton, J., Nickless G., Green, Ch.: Pharmaceutical Care Made Easy, London, Pharnaceuticl Press, 2006, 178 p.
7. Edwards, C., Stillman, P.: Minor Illness or Major Disease? The clinical pharmacist in the community. Fourth edition, London, Pharmaceutical Press, 2006, 285 p.
8. Stephens, M.: Hospital Pharmacy, London, Pharmaceutical Press, 2006, 285 p.
9. Harman, R.J.: Patient Care in Community Practice, London, Pharmaceutical Press, 2002, 203 p.
10. Harman, R.J.: Handbook of Pharmacy Health Education, second edition, London, Pharmaceutical Press, 2001, 299 p.
11. European Pharmacopoeia – Ph. Eur. 8th Edition

**Languages necessary to complete the course:**

English language.

**Notes:**

Obligatory course taught in the 8th semester of study only.

**Past grade distribution**

Total number of evaluated students: 512

A	B	C	D	E	FX
14,65	23,24	21,88	19,34	20,51	0,39

**Lecturers:** PharmDr. Miroslava Snopková, PhD., PharmDr. Ľubica Lehocká, PhD., PharmDr. Lucia Masaryková, PhD.

**Last change:** 30.05.2016

**Approved by:**

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KChTL/08-Mgr-A/19	<b>Course title:</b> Selected Chapters in Organic Chemistry
<b>Educational activities:</b> <b>Type of activities:</b> practicals / lecture / seminar <b>Number of hours:</b> <b>per week:</b> 0 / 1 / 1 <b>per level/semester:</b> 0 / 14 / 14 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 2	
<b>Recommended semester:</b> 2.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> final evaluation: examination in form of the summary test Scale of assessment (preliminary/final): 0/100	
<b>Learning outcomes:</b> The course provides a comprehensive preparation in the field of stereochemistry of organic and pharmaceutically significant compounds in pharmacy.	
<b>Class syllabus:</b> Stereochemistry as a phenomenon. Nomenclature and notation of stereoisomers. Conformation of acyclic and cyclic organic molecules. Chirality of molecules with asymmetric substituted tetrahedral centers. Optical activity. Enantiomers, racemates. Diastereoisomers. Meso compounds. Chirality of the systems not containing stereogenic carbon atom. Axial chirality of allen and biaryl types. Helical structures. Chirality of pharmaceuticals and biological activity. Stereoisomerism on bonds with hampered rotation. Stereoisomerism on a double bond. E/Z isomerism and nomenclature of the respective type of isomers. Cis/trans isomerism of cyclic systems. Stereochemistry of some polymers. Carbohydrates, proteins and nucleic acids. Synthetic polymers. Stereochemistry and organic synthesis. Chiral pool. Techniques and procedures used in separation of stereoisomers. Asymmetric organic synthesis – chiral natural compounds, chiral agents and catalysts.	
<b>Recommended literature:</b> 1. Devínsky F. et al. Organic Chemistry for Pharmacy Students. Comenius University Press, Bratislava, 2010 2. Čižmáriková R.: Laboratory manual for practice in organic chemistry. Bratislava, Comenius University, 2012. 3. Buxton, S.R., Roberts, S. M.: Guide to Organic Stereochemistry. London : Longman, 1996	
<b>Languages necessary to complete the course:</b> English language	
<b>Notes:</b> The course is held only in winter semester. Teachers: Assoc. prof. RNDr. Ružena Čižmáriková, CSc., Assoc. prof. PharmDr. Miloš Lukáč, PhD.; Assoc. prof. PharmDr. Jindra Valentová, PhD.	



<b>Past grade distribution</b>					
Total number of evaluated students: 31					
A	B	C	D	E	FX
6,45	22,58	19,35	29,03	12,9	9,68
<b>Lecturers:</b> RNDr. Roman Mikláš, PhD., Mgr. Natalia Lucia Miklášová, PhD.					
<b>Last change:</b> 10.09.2019					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KJ/05-Mgr-A/00	<b>Course title:</b> Slovak Language for International Students (1)
<b>Educational activities:</b> <b>Type of activities:</b> practicals / lecture / seminar <b>Number of hours:</b> <b>per week:</b> 0 / 0 / 2 <b>per level/semester:</b> 0 / 0 / 28 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 2	
<b>Recommended semester:</b> 1.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> - active presence at seminars - midterm test (15%) - final test (85%) To complete the course successfully a student must achieve at least 60%. Scale of assessment (preliminary/final): 15% / 85%	
<b>Learning outcomes:</b> After completing the seminars a student obtains basic communication skills and grammar structures needed for everyday life in Slovakia.	
<b>Class syllabus:</b> The lessons concentrate on the following topics: slovak alphabet, social phrases, greetings and farewells, basic dialogues, interior (house, flat, office), countries.	
<b>Recommended literature:</b> Kamenárová, R. a kol.: Krížom-krážom, Slovenčina A1. Bratislava: Univerzita Komenského, 2018 Ivorníková, H. a kol.: Krížom-krážom, Slovenčina A1 + A2, Cvičebnica. Bratislava: Univerzita Komenského, 2009	
<b>Languages necessary to complete the course:</b> Slovak and English languages	
<b>Notes:</b> Slovak Language for Foreign Students (1-4) within Master Study Programme is obligatory elective and is carried out in English study programme in four semesters. It is recommended to take the courses gradually from the 1st to the 4th semester of the study, i.e. Slovak Language for Foreign Students (1) in the 1st (winter) semester of study.	

<b>Past grade distribution</b>					
Total number of evaluated students: 764					
A	B	C	D	E	FX
32,59	16,75	16,62	15,45	15,45	3,14
<b>Lecturers:</b> PhDr. Darina Kližanová					
<b>Last change:</b> 05.03.2021					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KJ/06-Mgr-A/00	<b>Course title:</b> Slovak Language for International Students (2)
<b>Educational activities:</b> <b>Type of activities:</b> practicals / lecture / seminar <b>Number of hours:</b> <b>per week:</b> 0 / 0 / 2 <b>per level/semester:</b> 0 / 0 / 28 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 2	
<b>Recommended semester:</b> 2.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> - active presence at seminars - midterm test (15%) - final test (85%) To complete the course successfully a student must achieve at least 60%. Scale of assessment (preliminary/final): 15% / 85%	
<b>Learning outcomes:</b> After completing the seminars a student obtains basic communication skills and grammar structures needed for the work in a pharmacy.	
<b>Class syllabus:</b> The lessons concentrate on the following topics: Bratislava - capital city of Slovakia, life in the town and the country, professions, shopping, pharmacy.	
<b>Recommended literature:</b> Kamenárová, R. a kol.: Krížom-krážom, Slovenčina A1. Bratislava: Univerzita Komenského, 2018 Ivorníková, H. a kol.: Krížom-krážom, Slovenčina A1 + A2, Cvičebnica. Bratislava: Univerzita Komenského, 2009	
<b>Languages necessary to complete the course:</b> Slovak and English languages	
<b>Notes:</b> Slovak Language for Foreign Students (1-4) within Master Study Programme is obligatory elective and is carried out in English study programme in four semesters. It is recommended to take the courses gradually from the 1st to the 4th semester of the study, i.e. Slovak Language for Foreign Students (2) in the 2nd (summer) semester of study.	

<b>Past grade distribution</b>					
Total number of evaluated students: 686					
A	B	C	D	E	FX
20,99	16,03	19,68	15,89	20,26	7,14
<b>Lecturers:</b> PhDr. Darina Kližanová					
<b>Last change:</b> 05.03.2021					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF.KJ/07-Mgr-A/00	<b>Course title:</b> Slovak Language for International Students (3)
<b>Educational activities:</b> <b>Type of activities:</b> practicals / lecture / seminar <b>Number of hours:</b> <b>per week:</b> 0 / 0 / 2 <b>per level/semester:</b> 0 / 0 / 28 <b>Form of the course:</b> on-site learning	
<b>Number of credits:</b> 2	
<b>Recommended semester:</b> 3.	
<b>Educational level:</b> I.II.	
<b>Prerequisites:</b>	
<b>Course requirements:</b> - active presence at seminars - midterm test (15%) - final test (85%) To complete the course successfully a student must achieve at least 60%. Scale of assessment (preliminary/final): 15% / 85%	
<b>Learning outcomes:</b> After completing the seminars a student obtains basic communication skills and grammar structures useful for formal oral and written communication.	
<b>Class syllabus:</b> The lessons concentrate on the following topics: foods, daily routines, telling the time, school system, study at the University, study of pharmacy.	
<b>Recommended literature:</b> Kamenárová, R. a kol.: Krížom-krážom, Slovenčina A1. Bratislava: Univerzita Komenského, 2018 Ivorníková, H. a kol.: Krížom-krážom, Slovenčina A1 + A2, Cvičebnica. Bratislava: Univerzita Komenského, 2009	
<b>Languages necessary to complete the course:</b> Slovak and English languages	
<b>Notes:</b> Slovak Language for Foreign Students (1-4) within Master Study Programme is obligatory elective and is carried out in English study programme in four semesters. It is recommended to take the courses gradually from the 1st to the 4th semester of the study, i.e. Slovak Language for Foreign Students (3) in the 3rd (winter) semester of study.	

<b>Past grade distribution</b>					
Total number of evaluated students: 539					
A	B	C	D	E	FX
11,32	19,67	19,11	18,92	27,64	3,34
<b>Lecturers:</b> PhDr. Darina Kližanová					
<b>Last change:</b> 05.03.2021					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KJ/08-Mgr-A/00		<b>Course title:</b> Slovak Language for International Students (4)			
<b>Educational activities:</b> <b>Type of activities:</b> practicals / lecture / seminar <b>Number of hours:</b> <b>per week:</b> 0 / 0 / 2 <b>per level/semester:</b> 0 / 0 / 28 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 2					
<b>Recommended semester:</b> 4.					
<b>Educational level:</b> I.II.					
<b>Prerequisites:</b>					
<b>Course requirements:</b> - active presence at seminars - midterm test (15%) - final test (85%) To complete the course successfully a student must achieve at least 60%. Scale of assessment (preliminary/final): 15% / 85%					
<b>Learning outcomes:</b> After completing the seminars a student deepens communication skills specific grammar structures.					
<b>Class syllabus:</b> The lessons concentrate on the following topics: work place, correspondance and telephoning, reading newspaper articles.					
<b>Recommended literature:</b> Kamenárová, R. a kol.: Krížom-krážom, Slovenčina A1. Bratislava: Univerzita Komenského, 2007 Ivorníková, H. a kol.: Krížom-krážom, Slovenčina A1 + A2, Cvičebnica. Bratislava: Univerzita Komenského, 2009					
<b>Languages necessary to complete the course:</b> Slovak and English languages					
<b>Notes:</b> Slovak Language for Foreign Students (1-4) within Master Study Programme is obligatory elective and is carried out in English study programme in four semesters. It is recommended to take the courses gradually from the 1st to the 4th semester of the study, i.e. Slovak Language for Foreign Students (4) in the 4th (winter) semester of study.					
<b>Past grade distribution</b> Total number of evaluated students: 517					
A	B	C	D	E	FX
17,41	15,09	19,92	18,57	25,15	3,87



<b>Lecturers:</b> PhDr. Darina Kližanová
<b>Last change:</b> 10.12.2015
<b>Approved by:</b>

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KORF/12-Mgr-A/00		<b>Course title:</b> Social Pharmacy and Pharmacoeconomics			
<b>Educational activities:</b> <b>Type of activities:</b> practicals / lecture / seminar <b>Number of hours:</b> <b>per week:</b> 0 / 2 / 2 <b>per level/semester:</b> 0 / 28 / 28 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 5					
<b>Recommended semester:</b> 6.					
<b>Educational level:</b> I.II.					
<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: 606					
A	B	C	D	E	FX
31,02	13,2	17,99	11,55	24,75	1,49
<b>Lecturers:</b> doc. PharmDr. Tomáš Tesař, PhD., MBA					
<b>Last change:</b> 02.06.2015					
<b>Approved by:</b>					

## STATE EXAM DESCRIPTION

<b>University:</b> Comenius University in Bratislava	
<b>Faculty:</b> Faculty of Pharmacy	
<b>Course ID:</b> FaF/900-Mgr-A/15	<b>Course title:</b> Social Pharmacy and Retail Pharmacy
<b>Number of credits:</b> 4	
<b>Educational level:</b> I.II.	
<b>State exam syllabus:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KFT/16-Mgr-A/00		<b>Course title:</b> Toxicology of Xenobiotics			
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 2 / 0 / 1 <b>per level/semester:</b> 28 / 0 / 14 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 4					
<b>Recommended semester:</b> 6.					
<b>Educational level:</b> I.II.					
<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: 177					
A	B	C	D	E	FX
8,47	22,03	20,9	19,21	10,73	18,64
<b>Lecturers:</b> doc. RNDr. Eva Račanská, CSc., prof. RNDr. Magdaléna Kuželová, CSc., Mgr. Ondrej Sprušanský, PhD., PharmDr. Elena Ondriašová, CSc., doc. PharmDr. Peter Křenek, PhD., doc. PharmDr. Marek Máťuš, PhD., Mgr. Peter Vavrínek, PhD., PharmDr. Zuzana Kiliánová, PhD., Mgr. Lenka Bies Piváčková, PhD., PharmDr. Tomáš Rajtík, PhD.					
<b>Last change:</b> 02.06.2015					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KFT/17-Mgr-A/00		<b>Course title:</b> Veterinary Pharmacology			
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 2 / 0 / 0 <b>per level/semester:</b> 28 / 0 / 0 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 2					
<b>Recommended semester:</b> 8.					
<b>Educational level:</b> I.II.					
<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: 26					
A	B	C	D	E	FX
34,62	26,92	23,08	11,54	3,85	0,0
<b>Lecturers:</b> doc. PharmDr. Marek Máťuš, PhD., Mgr. Peter Vavrínek, PhD.					
<b>Last change:</b> 02.06.2015					
<b>Approved by:</b>					

## COURSE DESCRIPTION

<b>University:</b> Comenius University in Bratislava					
<b>Faculty:</b> Faculty of Pharmacy					
<b>Course ID:</b> FaF.KBMBL/14-Mgr-A/00		<b>Course title:</b> Xenobiochemistry			
<b>Educational activities:</b> <b>Type of activities:</b> lecture / laboratory practicals / seminar <b>Number of hours:</b> <b>per week:</b> 2 / 1 / 0 <b>per level/semester:</b> 28 / 14 / 0 <b>Form of the course:</b> on-site learning					
<b>Number of credits:</b> 4					
<b>Recommended semester:</b> 6.					
<b>Educational level:</b> I.II.					
<b>Prerequisites:</b>					
<b>Course requirements:</b> Basic condition for the practical exercises recognition is 60% yield as the sum of two semestral tests. The course is completed by written examination.					
<b>Learning outcomes:</b> After completing of xenobiochemistry course the student should identify and outline the main biotransformation way of the metabolites production according to the structure of drugs. More over should have a good knowledge about CYPs enzyme isoforms particularly their creation, properties and interactions on cellular level.					
<b>Class syllabus:</b> Principles of xenobiotic ( drug ) metabolism and phases of biotransformation reactions based on chemical structure. Characterization and function of biotransformation enzymes, mechanism of the 1st phase reaction on CYP-450 level, condition of the CYPs isoenzymes creation – substrate, tissue, species and subcellular specificity. Potential impact of CYPs induction or inhibition on pharmacotherapeutical effect, possible interactions or side drug effect. Meaning of the second biotransformation phase – conjugation reactions with endogenic substrates. Knowledge of xenobiochemistry opens a modern view of safe and efficient pharmacotherapy thus helps with research of the new potential structures of drugs.					
<b>Recommended literature:</b> A Handbook of Bioanalysis and Drug Metabolism, Ed. Gary Evans, CRC Press, London, NewYork, 2004. Bernard Testa and Stefanie D. Kramer: Chemistry and Biodiversity vol.3, Verlag, 2006.					
<b>Languages necessary to complete the course:</b> English language.					
<b>Notes:</b>					
<b>Past grade distribution</b> Total number of evaluated students: 126					
A	B	C	D	E	FX
13,49	14,29	5,56	14,29	11,9	40,48

<b>Lecturers:</b> PharmDr. Andrea Balažová, PhD., PharmDr. Katarína Šišková, PhD.
<b>Last change:</b> 02.06.2015
<b>Approved by:</b>