

Course descriptions

TABLE OF CONTENTS

1. N-bBCH-033/18	Advanced Practical in Biochemistry.....	3
2. N-bBCH-013/15	Analytical Chemistry.....	5
3. N-bBCH-012/15	Animal and Human Physiology.....	8
4. N-bBCH-019/15	Bachelor seminar 1.....	10
5. N-bBCH-020/15	Bachelor seminar 2.....	12
6. N-bBCH-021/15	Bachelor theses.....	14
7. N-bBCH-031/15	Biochemická a genetická variabilita človeka.....	16
8. N-bBCH-009/15	Biochemistry.....	17
9. N-bBCH-024/15	Bioinformatics.....	18
10. N-bBCH-034/19	Bioinorganic Chemistry.....	19
11. N-bBCH-017/15	Biostatistics.....	20
12. N-bBCH-016/15	Biotechnology.....	21
13. N-bXCJ-121/19	CLIL 1 – Content and language integrated learning.....	23
14. N-bXCJ-122/19	CLIL 2 – Content and language integrated learning.....	24
15. N-bBCH-004/15	Cell Biology.....	25
16. N-bBCH-038/15	Computational Chemistry and Molecular Modelling.....	26
17. N-bOBH-101/17	Defence of Bachelor Thesis (state exam).....	27
18. N-bXCJ-070/10	English 1.....	28
19. N-bXCJ-071/10	English 2.....	29
20. N-bXCJ-086/10	English 3.....	30
21. N-bXCJ-087/10	English 4.....	31
22. N-bXCJ-118/18	English language 3 - preparation course for UNiCert.....	32
23. N-bXCJ-119/18	English language 4 - preparation course for UNiCert.....	33
24. N-bCOV-008/19	Experimental Organic Chemistry.....	34
25. N-bXCJ-120/19	Foreign language placement test.....	35
26. N-bBCH-001/15	General and Inorganic Chemistry.....	36
27. N-bBCH-010/15	Genetics.....	37
28. N-bXCJ-072/10	German 1.....	38
29. N-bXCJ-073/10	German 2.....	39
30. N-bXCJ-096/10	German 3.....	40
31. N-bXCJ-097/10	German 4.....	41
32. N-bEXX-116/19	Globálne problémy životného prostredia.....	42
33. N-bXXX-001/19	Green University 1.....	43
34. N-bXXX-002/19	Green University 2.....	44
35. N-bBCH-028/15	Human Genetics.....	45
36. N-bBCH-015/15	Immunology.....	46
37. N-bBCH-036/15	Introduction to Bioanalysis.....	47
38. N-bBCH-039/15	Introduction to Nuclear Analyses.....	49
39. N-bXDI-004/10	Introduction to Philosophy (1).....	50
40. N-bXDI-005/10	Introduction to Philosophy (2).....	51
41. N-bXCJ-094/10	Latin.....	52
42. N-bXCJ-095/10	Latin.....	53
43. N-bBCH-040/15	Legislation and Ethics.....	54
44. N-bBCH-002/15	Mathematics.....	56
45. N-bBCH-026/15	Methods in Molecular Biology.....	57
46. N-bBCH-007/15	Microbiology.....	58
47. N-bBCH-011/15	Molecular Biology.....	59

48. N-bBCH-034/15	Molecular Spectroscopy.....	60
49. N-bBCH-005/15	Organic Chemistry.....	61
50. N-bCOV-007/19	Organic Chemistry.....	62
51. N-bBCH-033/15	Organic Chemistry 2.....	63
52. N-bBCH-035/15	Organic Synthesis.....	64
53. N-bBCH-042/15	Physical Chemistry.....	65
54. N-bXTV-104/18	Physical Education.....	66
55. N-bXTV-101/18	Physical Education 1.....	67
56. N-bXTV-102/18	Physical Education 2.....	68
57. N-bXTV-103/18	Physical Education 3.....	69
58. N-bXTV-105/18	Physical Education 5.....	70
59. N-bXTV-106/18	Physical Education 6.....	71
60. N-bBCH-003/15	Physics.....	72
61. N-bBCH-018/15	Practical Training.....	73
62. N-bGXX-002/19	Practice-oriented geology for all.....	75
63. N-bXCJ-110/15	Professional English 1.....	76
64. N-bXCJ-111/15	Professional English 2.....	77
65. N-bBCH-037/15	Radiation Hygiene and Safety.....	78
66. N-bBCH-025/15	Regulation of Gene Expression.....	79
67. N-bXDI-006/10	Rhetoric.....	80
68. N-bBCH-027/15	Seminar on Methods in Molecular Biology.....	81
69. N-bBCH-006/15	Seminar on Organic Chemistry.....	82
70. N-bBCH-030/15	Seminar on Topics in DNA Analysis Methods.....	83
71. N-bBCH-014/15	Separation Methods.....	84
72. N-bBCH-023/15	Structure and Functions of Biomolecules.....	87
73. N-bUXX-205/15	Summer physic-educational meeting 2.....	89
74. N-bBCH-041/15	Theoretical and experimental medicine.....	90
75. N-bBCH-029/15	Topics in DNA Analysis Methods.....	91
76. N-bBCH-008/15	Virology.....	92
77. N-bUXX-201/00	Winter physic-educational meeting.....	93
78. N-bEXX-115/19	Človek ako súčasť prírody.....	94

COURSE DESCRIPTION

University: Comenius University in Bratislava	
Faculty: Faculty of Natural Sciences	
Course ID: PriF.KBCh/N-bBCH-033/18	Course title: Advanced Practical in Biochemistry
Educational activities: Type of activities: practicals Number of hours: per week: 8 per level/semester: 112 Form of the course: on-site learning	
Number of credits: 8	
Recommended semester: 6.	
Educational level: I.	
Prerequisites:	
Recommended prerequisites: Biochemistry	
Course requirements: At each exercise students write 10-point test. At the end of the semester students take final control test, from which they must attain at least 50%. Students, who achieved more then 50% of the total assessment, will be evaluated as follows: $\geq 90\%$ A, $\geq 80\%$ B, $\geq 70\%$ C, $\geq 60\%$ D, $\geq 50\%$ E. Credits will not be awarded to a student who receives less than 50% of the total assessment (control test and activity during the semester). Scale of assessment (preliminary/final): 60% ongoing/ 40% final exam	
Learning outcomes: Students acquire advanced laboratory skills in biochemical, molecular biological and microbiological techniques. After completing this course students should be able to apply in biochemical and biomedical research.	
Class syllabus: Advanced Practice in Biochemistry is a set of modern laboratory methods in biochemistry, molecular and cell biology. This course will enable students to acquire skills in following techniques: 1. Isolation and restriction analysis of yeast mitochondrial DNA. 2. Egg-white lysozyme purification using ion-exchange chromatography. 3. Yeast <i>Saccharomyces cerevisiae</i> use for transcription studies. 4. Yeast <i>Saccharomyces cerevisiae</i> lipid extraction and separation. 5. Specific antibody determination using ELISA.	
Recommended literature: Lodish, H. et al. (2016), Molecular Cell Biology, eight edition, W.H Freeman and Company Berg, J.M. et al. (2015), Biochemistry, eight edition, W.H Freeman and Company Sambrook, J., Fritsch, E.F. and Maniatis, T. (1989) Molecular cloning: A laboratory manual, Cold Spring Harbor Laboratory Press	
Languages necessary to complete the course: English	

Notes:					
Past grade distribution					
Total number of evaluated students: 1					
A	B	C	D	E	FX
0,0	100,0	0,0	0,0	0,0	0,0
Lecturers: Ing. Martina Neboháčová, PhD.					
Last change: 08.01.2019					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava	
Faculty: Faculty of Natural Sciences	
Course ID: PriF.KAlCh/N-bBCH-013/15	Course title: Analytical Chemistry
Educational activities: Type of activities: practicals / lecture / seminar Number of hours: per week: 5 / 4 / 2 per level/semester: 70 / 56 / 28 Form of the course: on-site learning	
Number of credits: 11	
Recommended semester: 4.	
Educational level: I.	
Prerequisites:	
Course requirements: There will be two running written tests, each for 10 points, during the semester on seminars, in summary maximum 20 points. Only student obtaining from both tests minimum 50% will pass to final exam test. Experimental laboratory work will be graded as follows: continuous compounding will be evaluated by 20 points maximum involving theoretical preparation for laboratory work, activity and quality of results in the experimental work summarized in laboratory protocol. Final test from topics of laboratory will be enabled only to student who submitted protocols from all done laboratory experiments - student can get maximum 20 points, in summary max. 40 points for experimental laboratory work. Only those students will be admitted to final examination who achieve at least 50% of the points from seminar tests and laboratory work evaluation. Final exam related to lecture topics will consist of 40-point test. For clarification of boundary test results it is possible to require additional oral answer to the question for maximum 4 points included. Overall grade will consist of summary evaluation of final exam, seminar tests and experimental work according to formula $(0.4 \times \% \text{ final exam}) + (0.2 \times \% \text{ seminar tests}) + (0.4 \times \% \text{ laboratory work}) = \text{resulting \%}$. For grade A, it is necessary to obtain at least 92 %, for grade B at least 84 %, for grade C at least 76 %, for grade D at least 68 % and for grade E at least 60 % of all points. Credits will not be assigned to a student, who will not earn at least 60% from running tests, or who will not earn at least 60% from laboratory work and to student, who will not earn at least 60 % from final exam.	
Learning outcomes: Chemistry students will become familiar with the information about recent state of quantitative observation - measurement within the system of scientific cognition of material reality; about generation of analytical signal and classification of analytical principles and methods, about analytical process, principles, procedures and techniques; about approach to solution of identification problems, about characterization and quantification of chemical substances in science and technology. Students become familiar also with the possibility to reveal and search for solution of material based research, production and social practice with the aid of chemical analyses as tools of analytical chemistry. The objective involves also calculus in analytical chemistry and solution of model situation from social practice that are discussed in daily press and information media. Student will solve case tasks from biochemistry, biotechnology and the other natural sciences. Current use of analytical chemistry methods and their future potential and outline of their development trends will be discussed. The objective is taught in three forms. Theoretical aspects and calculus basics are	

taught in lectures and seminars, respectively. Inevitable part of the objective is also instrumental experimental work in the laboratory.

Class syllabus:

1. Definition, matter of interest and resources of analytical chemistry. History of analytical chemistry in the context with society development. Relations of knowledge – signal – information dealing with fundamental aspects of material world around us. Method of scientific cognition; methodology of scientific work in analytical chemistry; observation, measurement, experiment, hypothesis, theory, correction functions in science. Relations of science and technology from the point-of-view of current possibilities of analytical chemistry. Trace analysis and microanalysis.
2. Measurement. Analytical signal and its properties. Generation of analytical signal. Classification of analytical signals and noise. Comprehensive principles of measurement and evaluation of quality and quantity of chemical substances. Potential and restrictions of measurement and detection analytical methods.
3. Classification of analytical principles according to selectivity, type and properties of analytical signal: qualitative tests and reactions, gravimetry, volumetry. Important chemical concepts, amount and concentration. Importance of quantity, units, measures and mass. International system of quantities (SI). Solutions and concentration. Chemical stoichiometry . Solution of chemical equilibrium. Volumetry - titration. Some general aspects of volumetry. Standard solutions. Calculus. Titration curves. Principles and analytical utilization of neutralization, precipitation, oxidation-reduction, complex forming titrations.
4. Classification of analytical principles according to selectivity, type and properties of analytical signal – electroanalytical methods. Electrogravimetry: weighing of electrochemically deposited substance. Coulometric analytical methods. Voltamperometry. Polarography. Potentiometry: determination of ions and molecules concentration. General principles. Electrodes. Direct potentiometry, pH-metry, ion-selective electrodes. Potentiometric titrations. Conductometry and conductometric detection.
5. Spectroscopic analytical methods, measurement of chemical substances by use of electromagnetic radiation (or light) properties. Interaction of radiation and mater. Atomic absorption spectroscopy. Instrumentation for measurement of light emission or absorption. Atomic emission spectrometers, spectrofluorimeters, UV-VIS photometers, spectrophotometers. Infra-red spectrometers. Analytical utilization of molecular and atomic spectroscopic methods. Analytical molecular fluorescence spectroscopy. Analytical methods based on light scattering by ions and molecules (ELSD, etc). Analytical applications of optical methods.
6. Introduction to analytical separation methods. Classification of separation principles and methods. Masking and demasking reactions. Precipitation and filtration. Separation of volatile substances by distillation. Isolation and separation of substances by extraction. Ion-exchange.
7. Chromatographic separation. Generalised outline of chromatography. Classification of chromatographic methods. Gas chromatography (GC) - principles. Instrumentation of gas chromatography. Carrier gas and auxiliary gas. GC columns and stationary phases. Application of GC for chemical analysis of substances. High-performance liquid chromatography (HPLC). HPLC instrumentation. Separation mechanism: distribution , adsorption, ion-exchange, affinity based LC. Normal phase vs. reversed phase systems. Gel chromatography. Supercritical fluid chromatography (SFC).
8. Electroreparation methods. Capillary electrophoresis vs planar techniques. Instrumentation. Basic principles of electrophoretic methods. Zone electrophoresis, isotachopheresis, isoelectric focusing. Application of capillary electrophoresis in chemical analysis.
9. Mass spectrometry (MS) basic principles. Basic scheme of mass spectrometer. Variables and conditions of measurement by MS. Output signal of MS. MS instrumentation. Basic ionization techniques in MS. Identification and confirmation of identity. Automation of analytical methods

in QC/QA laboratories. Application of combined techniques for solution of selected analytical problems. 10. Automation in analytical laboratories. The combined application of analytical methods to solve selected analytical problems. 11. Practical examples of analytical methods usage in procedures of chemical analysis for solution of actual practical problems I. 12. Practical examples of analytical methods usage in procedures of chemical analysis for solution of actual practical problems II. 13. Practical examples of analytical methods usage in procedures of chemical analysis for solution of actual practical problems III. 14. Final thinking about new trends in analytical chemistry. Laboratory experiments 1. Volumetric analysis. Determination of ascorbic acid (vitamin C) in fruit juice. Determination of boric acid in eye disinfection instillation (eye drops). Determination of copper in water by kinetic methods (catalytic effect). Manganometric determination of chemical oxygen demand in aqueous samples (waste water). 2. Electrogravimetry. Determination of copper in natural sample. Potentiometric determination of soil acidity. 3. Electrophoretic separation methods. Removal of matrix component excess from sample. Determination of glutamate in food samples. Determination of nitrate and sulphate in tap water by capillary isotachopheresis with conductivity detection. 4. Chromatographic separation methods. Determination of methanol in alcoholic beverage by GC. HPLC-UV determination of aromatic hydroxyl compounds. Separation of water-soluble dyes by paper chromatography. 5. Spectrophotometry. Determination of calcium and sodium in mineral water by flame photometry. AAS determination of manganese in steel samples. Identity confirmation and determination of synthetic food colorant in food by UV spectrophotometry. Spectrophotometric determination of copper in real sample.																	
Recommended literature: D. A. Skoog, F. J. West, F. J. Holler, S. R. Crouch: Analytical Chemistry. An Introduction. Saunders Coll. Publ.2000; G. Schwedt: The Essential Guide to Analytical Chemistry, Wiley, New York, 1997; R. Kellner, J-M. Mermet, M. Otto, Analytical Chemistry, John Wiley & Sons Australia, Ltd, 2013; Cvičenie: návody na stránke www.analytika.sk																	
Languages necessary to complete the course: English																	
Notes:																	
Past grade distribution Total number of evaluated students: 27 <table border="1"> <thead> <tr> <th>A</th><th>B</th><th>C</th><th>D</th><th>E</th><th>FX</th></tr> </thead> <tbody> <tr> <td>33,33</td><td>22,22</td><td>18,52</td><td>22,22</td><td>0,0</td><td>3,7</td></tr> </tbody> </table>						A	B	C	D	E	FX	33,33	22,22	18,52	22,22	0,0	3,7
A	B	C	D	E	FX												
33,33	22,22	18,52	22,22	0,0	3,7												
Lecturers: prof. RNDr. Milan Hutta, CSc., doc. RNDr. Marian Masár, PhD., Ing. Roman Szücs, PhD., Mgr. Jasna Hradski, PhD.																	
Last change: 19.11.2018																	
Approved by:																	

COURSE DESCRIPTION

University: Comenius University in Bratislava	
Faculty: Faculty of Natural Sciences	
Course ID: PriF.KŽFE/N-bBCH-012/15	Course title: Animal and Human Physiology
Educational activities: Type of activities: lecture / seminar Number of hours: per week: 2 / 2 per level/semester: 28 / 28 Form of the course: on-site learning	
Number of credits: 5	
Recommended semester: 3.	
Educational level: I.	
Prerequisites:	
Course requirements: Grades will be based on the final exam discussion (contributing 100%). The course has a standardized grading system which is identified below: A (91 – 100%): Outstanding, excellent work (exceptional performance with strong evidence of original thinking and obvious capacity to analyze, synthesize and evaluate. B (81 – 90 %): Good, competent work; laudable performance with evidence of some original thinking, good problem-solving ability, exhibiting a serious, responsible engagement with the course content. C (73 – 80): Adequate, reasonably satisfactory work; fair performance but infrequent evidence of original thinking or the capacity to analyze, satisfies the minimum requirements of the course. D (66 – 72%): Less acceptable work; relatively weak performance with little evidence of original thinking or ability to analyze or synthesize course material. E (60 – 65%): Minimally acceptable work; very weak performance with little evidence of original thinking, showing inadequate grasp of some basic elements of the course. Fx (under 60%): Inadequate work; poor performance that indicates a lack of understanding or misunderstanding of essential subject matter.	
Learning outcomes: This course brings the background and skills needed to understand and apply physiological mechanisms control in basic body functions. By the end of this course students should be able to: • Understand general aspects of animal physiology and principles of cell physiology. • Obtain the skills, knowledge, experience needed to work effectively in physiological labs • To integrate concepts, skills and approaches from regulatory mechanisms at the level of animal cell and integrated organism. • Understand control systems, such as cardiovascular, gastrointestinal, respiratory, immune, reproductive and nerve systems	
Class syllabus: 1. Subject of animal physiology, general aspects and development in the field 2. Cell physiology, Interaction of cell as an open system with other compartments, transport systems 3. Cell membrane, distribution of positive and negative ions, membrane potential, action potential 4. Control mechanisms at the level of cell, intracellular transfer of signal, second messenger and post-receptor signal cascades.	

5. Absorption of nutrients, gastrointestinal secretion, control of HCl production, exocrine and endocrine secretion 6. Resorption, intermediary metabolism of carbohydrates, lipids and protein, basal melatonin. 7. Blood and their components, transport of O ₂ and CO ₂ , hemostasis, immune system 8. Cardiovascular system, systems controlling heart activity, physiology of peripheral vessels, blood pressure control 9. Respiration, phylogeny, transport of gasses effects of CO ₂ an acidobasic homeostasis, control of respiration adaptation to high latitudes 10. Excretion, phylogeny principles in vertebrates and mammals, transports in kidney, clearance, neural and humoral control 11. Reproduction, evolutionary principles, female and male reproductive systems neuroendocrine control 12. Neuroendocrine system, control of locomotion and sensory organs 13. Central nervous system					
Recommended literature: Berne and Levy Physiology, 6th edition, Mosby Elsevier, 2008.					
Languages necessary to complete the course: English					
Notes:					
Past grade distribution Total number of evaluated students: 35					
A	B	C	D	E	FX
8,57	14,29	17,14	20,0	40,0	0,0
Lecturers: doc. Mgr. Monika Okuliarová, PhD., RNDr. Katarína Stebelová, PhD., Mgr. Ľuboš Molčan, PhD., Mgr. Zuzana Dzirbiková, PhD.					
Last change: 19.11.2018					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava	
Faculty: Faculty of Natural Sciences	
Course ID: PriF.KBCh/N-bBCH-019/15	Course title: Bachelor seminar 1
Educational activities: Type of activities: seminar Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning	
Number of credits: 2	
Recommended semester: 5.	
Educational level: I.	
Prerequisites:	
Course requirements: Grades will be based on the final Bachelor seminar report (contributing 100%), which has a standardized grading system identified below: A (91 – 100%): Outstanding, excellent work (exceptional performance with strong evidence of original thinking and obvious capacity to analyze, synthesize and evaluate. B (81 – 90 %): Good, competent work; laudable performance with evidence of some original thinking, good problem-solving ability, exhibiting a serious, responsible engagement with the course content. C (73 – 80%): Adequate, reasonably satisfactory work; fair performance but infrequent evidence of original thinking or the capacity to analyze, satisfies the minimum requirements of the course. D (66 – 72%): Less acceptable work; relatively weak performance with little evidence of original thinking or ability to analyze or synthesize course material. E (60 – 65%): Minimally acceptable work; very weak performance with little evidence of original thinking, showing inadequate grasp of some basic elements of the course. Fx (under 60%): Inadequate work; poor performance that indicates a lack of understanding or misunderstanding of essential subject matter.	
Learning outcomes: Bachelor seminar is an integral part of the Biological Chemistry program to improve skills and abilities for independent research. The primary task is to prepare own Bachelor thesis report which will be discussed and reviewed at a seminar. The student is also expected to participate at the seminars as well as review and discuss another thesis in the field.	
Class syllabus: The Bachelor seminar offers an opportunity for Bachelor students (5th to 6th semester) to present and discuss their work in progress. Each session hosts one to two presentations. The discussion is shortly introduced by the researcher and chaired by one or more professors. Participants are expected to read and provide constructive feedback to the draft chapters. For this type of seminar, based on students' research, there is no specific syllabus.	
Recommended literature: Specifically, as recommended by supervisor	
Languages necessary to complete the course: English	

Notes:					
Past grade distribution					
Total number of evaluated students: 19					
A	B	C	D	E	FX
78,95	10,53	10,53	0,0	0,0	0,0
Lecturers: doc. RNDr. Anton Horváth, CSc., prof. RNDr. Vladimír Kováč, CSc.					
Last change: 13.11.2019					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava	
Faculty: Faculty of Natural Sciences	
Course ID: PriF.KŽFE/N-bBCH-020/15	Course title: Bachelor seminar 2
Educational activities: Type of activities: seminar Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning	
Number of credits: 2	
Recommended semester: 6.	
Educational level: I.	
Prerequisites:	
Course requirements: Grades will be based on the final Bachelor seminar report (contributing 100%), which has a standardized grading system identified below: A (91 – 100%): Outstanding, excellent work (exceptional performance with strong evidence of original thinking and obvious capacity to analyze, synthesize and evaluate. B (81 – 90 %): Good, competent work; laudable performance with evidence of some original thinking, good problem-solving ability, exhibiting a serious, responsible engagement with the course content. C (73 – 80%): Adequate, reasonably satisfactory work; fair performance but infrequent evidence of original thinking or the capacity to analyze, satisfies the minimum requirements of the course. D (66 – 72%): Less acceptable work; relatively weak performance with little evidence of original thinking or ability to analyze or synthesize course material. E (60 – 65%): Minimally acceptable work; very weak performance with little evidence of original thinking, showing inadequate grasp of some basic elements of the course. Fx (under 60%): Inadequate work; poor performance that indicates a lack of understanding or misunderstanding of essential subject matter.	
Learning outcomes: Bachelor seminar is an integral part of the Biological Chemistry program to improve skills and abilities for independent research. The primary task is to prepare own Bachelor thesis report which will be discussed and reviewed at a seminar. The student is also expected to participate at the seminars as well as review and discuss another thesis in the field.	
Class syllabus: The Bachelor seminar offers an opportunity for Bachelor students (5th to 6th semester) to present and discuss their work in progress. Each session hosts one to two presentations. The discussion is shortly introduced by the researcher and chaired by one or more professors. Participants are expected to read and provide constructive feedback to the draft chapters. For this type of seminar, based on students' research, there is no specific syllabus	
Recommended literature: Specifically, as recommended by supervisor	
Languages necessary to complete the course: English	

Notes:					
Past grade distribution					
Total number of evaluated students: 19					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
Lecturers: doc. RNDr. Anton Horváth, CSc., prof. RNDr. Vladimír Kováč, CSc.					
Last change: 13.11.2019					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava	
Faculty: Faculty of Natural Sciences	
Course ID: PriF.KBCh/N-bBCH-021/15	Course title: Bachelor theses
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning	
Number of credits: 2	
Recommended semester: 6.	
Educational level: I.	
Prerequisites:	
Course requirements: Grades will be based on the final Bachelor thesis report (contributing 100%), which has a standardized grading system identified below: A (91 – 100%): Outstanding, excellent work (exceptional performance with strong evidence of original thinking and obvious capacity to analyze, synthesize and evaluate. B (81 – 90 %): Good, competent work; laudable performance with evidence of some original thinking, good problem-solving ability, exhibiting a serious, responsible engagement with the course content. C (73 – 80%): Adequate, reasonably satisfactory work; fair performance but infrequent evidence of original thinking or the capacity to analyze, satisfies the minimum requirements of the course. D (66 – 72%): Less acceptable work; relatively weak performance with little evidence of original thinking or ability to analyze or synthesize course material. E (60 – 65%): Minimally acceptable work; very weak performance with little evidence of original thinking, showing inadequate grasp of some basic elements of the course. Fx (under 60%): Inadequate work; poor performance that indicates a lack of understanding or misunderstanding of essential subject matter.	
Learning outcomes: Bachelor thesis is an integral part of the Biological Chemistry program to improve skills and abilities for independent research in final Bachelor thesis. The primary task is to prepare own Bachelor thesis which will be discussed and reviewed individually by each supervisor.	
Class syllabus: The course in individual and consultative design offers an opportunity to complete and submit Bachelor thesis as well as to present and discuss work in progress. Participants are expected to read and provide constructive feedback to the draft chapters. For this type of seminar, based on students' research, there is no specific syllabus	
Recommended literature: Specifically, as recommended by supervisor	
Languages necessary to complete the course: English	
Notes:	

Past grade distribution					
Total number of evaluated students: 19					
A	B	C	D	E	FX
94,74	0,0	5,26	0,0	0,0	0,0
Lecturers: doc. RNDr. Anton Horváth, CSc., prof. RNDr. Vladimír Kováč, CSc.					
Last change: 13.11.2019					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KAn/N-bBCH-031/15		Course title: Biochemická a genetická variabilita človeka			
Educational activities: Type of activities: practicals / lecture Number of hours: per week: 2 / 2 per level/semester: 28 / 28 Form of the course: on-site learning					
Number of credits: 5					
Recommended semester: 6.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 8					
A	B	C	D	E	FX
75,0	0,0	0,0	0,0	25,0	0,0
Lecturers: prof. RNDr. Daniela Siváková, CSc., RNDr. Veronika Candráková Čerňanová, PhD., doc. RNDr. Lenka Vorobeľová, PhD.					
Last change:					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KBCh/N-bBCH-009/15		Course title: Biochemistry			
Educational activities: Type of activities: practicals / lecture / seminar Number of hours: per week: 5 / 4 / 2 per level/semester: 70 / 56 / 28 Form of the course: on-site learning					
Number of credits: 11					
Recommended semester: 3.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 34					
A	B	C	D	E	FX
2,94	14,71	23,53	32,35	23,53	2,94
Lecturers: doc. RNDr. Katarína Mikušová, DrSc., doc. Mgr. Peter Polčic, PhD., doc. RNDr. Marek Mentel, PhD.					
Last change: 07.05.2017					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KMB/N-bBCH-024/15		Course title: Bioinformatics			
Educational activities: Type of activities: lecture / seminar Number of hours: per week: 2 / 2 per level/semester: 28 / 28 Form of the course: on-site learning					
Number of credits: 5					
Recommended semester: 6.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 22					
A	B	C	D	E	FX
22,73	27,27	18,18	9,09	22,73	0,0
Lecturers: prof. RNDr. Ján Turňa, CSc., RNDr. Tomáš Szemes, PhD.					
Last change:					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KAgCh/N-bBCH-034/19		Course title: Bioinorganic Chemistry			
Educational activities: Type of activities: lecture / seminar Number of hours: per week: 2 / 1 per level/semester: 28 / 14 Form of the course: on-site learning					
Number of credits: 4					
Recommended semester: 4.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 13					
A	B	C	D	E	FX
53,85	23,08	7,69	7,69	0,0	7,69
Lecturers: RNDr. Lukáš Krivosudský, PhD.					
Last change:					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KBCh/N-bBCH-017/15		Course title: Biostatistics			
Educational activities: Type of activities: practicals / lecture Number of hours: per week: 2 / 2 per level/semester: 28 / 28 Form of the course: on-site learning					
Number of credits: 5					
Recommended semester: 4.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 27					
A	B	C	D	E	FX
40,74	22,22	7,41	14,81	11,11	3,7
Lecturers: doc. RNDr. Marianna Molnárová, PhD.					
Last change:					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava	
Faculty: Faculty of Natural Sciences	
Course ID: PriF.KBCh/N-bBCH-016/15	Course title: Biotechnology
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning	
Number of credits: 3	
Recommended semester: 4.	
Educational level: I.	
Prerequisites:	
Course requirements: Grades will be based on the final written examination (contributing 100%). The course has a standardized grading system which is identified below: A (92 – 100%): Outstanding, excellent work (exceptional performance with strong evidence of original thinking and obvious capacity to analyze, synthesize and evaluate. B (84 – 91 %): Good, competent work; laudable performance with evidence of some original thinking, good problem-solving ability, exhibiting a serious, responsible engagement with the course content. C (76 – 83): Adequate, reasonably satisfactory work; fair performance but infrequent evidence of original thinking or the capacity to analyze, satisfies the minimum requirements of the course. D (68 – 75%): Less acceptable work; relatively weak performance with little evidence of original thinking or ability to analyze or synthesize course material. E (60 – 67%): Minimally acceptable work; very weak performance with little evidence of original thinking, showing inadequate grasp of some basic elements of the course. Fx (under 60%): Inadequate work; poor performance that indicates a lack of understanding or misunderstanding of essential subject matter.	
Learning outcomes: After the course, students should understand basic principles of biotechnology and its impact on society in general and be able to orientate in the field of biotechnology information and be able to accumulate and transform the information into logical outputs in the form of presentation. An acquired knowledge will be in the area: • Legislative framework of pharmaceutical biotechnology and process of drug registration in Europe and USA. • Production process of biopharmaceuticals and required technological and non-technological necessities for production. • Fundamental organisms used for production of biopharmaceuticals and employed expression systems. • Basic potential application of classical and modern biotechnology in solving of environmental and food problems and perspectives of modern biotechnology in the fields.	
Class syllabus: Introduction to biotechnology, definition of the terms, development of biopharmaceuticals, preclinical and clinical trials and protection of the data thereof, registration process of drugs in	

USA and Europe and essential collection of the documents associated with it, ethic committee, good manufacturing practice, European directorate for the quality of medicines and healthcare and pharmacopoeia, and protection of intellectual property rights. Production process of biopharmaceuticals, down-stream and up-stream processes, product quality control, stabilization of biopharmaceuticals and drug formulation, stability testing, standards for injection water, clean room categories and endotoxins, process waste and its disposal. Production organisms and expression system thereof, basic features of expression systems from bacteria to transgenic animals. Examples of important biopharmaceuticals produced by selected production organisms: interferons, interleukins, tumor necrosis factors, hematopoietic growth factors, growth factors, hormones, blood product, enzymes, antibodies, vaccines and adjuvants. Basics in environmental biotechnology, bioprospecting, bioremediation, biosensors, biotechnology in waste disposal, biodegradable plastics produced by microorganisms. Basics in food biotechnology, genetically modified organisms in food biotechnology, single cell protein, legislative background for GMO.																	
Recommended literature: Groves M. J., 2006: Pharmaceutical biotechnology-second edition, CRC press, 396 pp. Smith J. E., 2009:Biotechnology,Cambridge university press, 280 pp. Walsh, G., 2007: Pharmaceutical biotechnology. John Wiley and Sons Ltd, 465 pp. Demain A. L., Davies J. E., 1999: Manual of industrial microbiology and biotechnology, American society for microbiology, 830 pp. Friedman Y. 2006: Building Biotechnology, Thinkbiotech, 306 pp.																	
Languages necessary to complete the course: English																	
Notes:																	
Past grade distribution Total number of evaluated students: 40 <table border="1"> <thead> <tr> <th>A</th><th>B</th><th>C</th><th>D</th><th>E</th><th>FX</th></tr> </thead> <tbody> <tr> <td>22,5</td><td>27,5</td><td>20,0</td><td>7,5</td><td>15,0</td><td>7,5</td></tr> </tbody> </table>						A	B	C	D	E	FX	22,5	27,5	20,0	7,5	15,0	7,5
A	B	C	D	E	FX												
22,5	27,5	20,0	7,5	15,0	7,5												
Lecturers: doc. RNDr. Anton Horváth, CSc., RNDr. Ján Krahulec, PhD.																	
Last change: 13.11.2019																	
Approved by:																	

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KJ/N-bXCJ-121/19		Course title: CLIL 1 – Content and language integrated learning			
Educational activities: Type of activities: seminar Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 5.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 8					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
Lecturers: Mgr. Barbara Kordíková					
Last change: 07.01.2020					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KJ/N-bXCJ-122/19		Course title: CLIL 2 – Content and language integrated learning			
Educational activities: Type of activities: seminar Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 6.					
Educational level: I.					
Prerequisites: PriF.KJ/N-bXCJ-121/19 - CLIL 1 – Content and language integrated learning					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 5					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
Lecturers: Mgr. Barbara Kordíková					
Last change: 07.01.2020					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KFR/N-bBCH-004/15		Course title: Cell Biology			
Educational activities: Type of activities: practicals / lecture Number of hours: per week: 2 / 2 per level/semester: 28 / 28 Form of the course: on-site learning					
Number of credits: 5					
Recommended semester: 1.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 39					
A	B	C	D	E	FX
2,56	23,08	28,21	17,95	23,08	5,13
Lecturers: Mgr. Michal Martinka, PhD., prof. RNDr. Ľubomír Tomáška, DrSc., prof. RNDr. Helena Bujdáková, CSc., doc. Mgr. Iveta Herichová, PhD., RNDr. Martin Mrva, PhD.					
Last change:					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KFTCh/N-bBCH-038/15		Course title: Computational Chemistry and Molecular Modelling			
Educational activities: Type of activities: practicals / lecture Number of hours: per week: 2 / 1 per level/semester: 28 / 14 Form of the course: on-site learning					
Number of credits: 3					
Recommended semester: 5.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 2					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
Lecturers: prof. RNDr. Ivan Černušák, DrSc., doc. Mgr. Michal Pitoňák, PhD.					
Last change:					
Approved by:					

STATE EXAM DESCRIPTION

University: Comenius University in Bratislava	
Faculty: Faculty of Natural Sciences	
Course ID: PriF.KBCh/N-bOBH-101/17	Course title: Defence of Bachelor Thesis
Number of credits: 8	
Educational level: I.	
State exam syllabus:	
Last change:	
Approved by:	

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KJ/N-bXCJ-070/10		Course title: English 1			
Educational activities: Type of activities: seminar Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 3., 5.					
Educational level: I.					
Prerequisites: PriF.KJ/N-bXCJ-120/19 - Foreign language placement test					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 3934					
A	B	C	D	E	FX
44,05	25,75	16,14	7,93	4,55	1,58
Lecturers: PhDr. Jarmila Cihová, PhD., PhDr. Štefánia Dugovičová, PhD., PhDr. Oľga Pažitková, CSc., RNDr. Tatiana Slováková, PhD., Mgr. Barbara Kordíková, Michael Jerry Sabo					
Last change: 07.01.2020					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KJ/N-bXCJ-071/10		Course title: English 2			
Educational activities: Type of activities: seminar Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning					
Number of credits: 3					
Recommended semester: 4., 6.					
Educational level: I.					
Prerequisites: PriF.KJ/N-bXCJ-070/10 - English 1					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 3599					
A	B	C	D	E	FX
52,82	23,56	14,37	5,17	3,25	0,83
Lecturers: PhDr. Jarmila Cihová, PhD., PhDr. Štefánia Dugovičová, PhD., PhDr. Oľga Pažitková, CSc., RNDr. Tatiana Slováková, PhD., Mgr. Barbara Kordíková, Michael Jerry Sabo					
Last change: 07.01.2020					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KJ/N-bXCJ-086/10		Course title: English 3			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 3., 5.					
Educational level: I.					
Prerequisites: PriF.KJ/N-bXCJ-070/10 - English 1,PriF.KJ/N-bXCJ-071/10 - English 2 and leboPriF.KJ/N-bXCJ-114/16 - English language for Chemistry students (2),PriF.KJ/N-bXCJ-113/16 - English language for Chemistry students (1)					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 547					
A	B	C	D	E	FX
63,62	23,95	7,86	2,56	1,1	0,91
Lecturers: PhDr. Jarmila Cihová, PhD., PhDr. Štefánia Dugovičová, PhD., PhDr. Oľga Pažitková, CSc., RNDr. Tatiana Slováková, PhD., Mgr. Barbara Kordíková, Michael Jerry Sabo					
Last change: 08.01.2020					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KJ/N-bXCJ-087/10		Course title: English 4			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 4., 6.					
Educational level: I.					
Prerequisites: PriF.KJ/N-bXCJ-070/10 - English 1, PriF.KJ/N-bXCJ-071/10 - English 2					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 327					
A	B	C	D	E	FX
71,87	20,8	6,12	0,61	0,31	0,31
Lecturers: PhDr. Jarmila Cihová, PhD., PhDr. Štefánia Dugovičová, PhD., PhDr. Oľga Pažitková, CSc., RNDr. Tatiana Slováková, PhD., Mgr. Barbara Kordíková, Michael Jerry Sabo					
Last change: 08.01.2020					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KJ/N-bXCJ-118/18		Course title: English language 3 - preparation course for UNiCert			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 3., 5.					
Educational level: I.					
Prerequisites: PriF.KJ/N-bXCJ-070/10 - English 1, PriF.KJ/N-bXCJ-071/10 - English 2					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 81					
A	B	C	D	E	FX
65,43	32,1	0,0	2,47	0,0	0,0
Lecturers: Mgr. Barbara Kordíková, PhDr. Jarmila Cihová, PhD., PhDr. Štefánia Dugovičová, PhD., RNDr. Tatiana Slováková, PhD.					
Last change: 08.01.2020					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KJ/N-bXCJ-119/18		Course title: English language 4 - preparation course for UNICert			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 4., 6.					
Educational level: I.					
Prerequisites: PriF.KJ/N-bXCJ-118/18 - English language 3 - preparation course for UNICert					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 68					
A	B	C	D	E	FX
85,29	11,76	0,0	0,0	0,0	2,94
Lecturers: Michael Jerry Sabo, Mgr. Barbara Kordíková					
Last change: 08.01.2020					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KOrCh/N-bCOV-008/19		Course title: Experimental Organic Chemistry			
Educational activities: Type of activities: practicals Number of hours: per week: 5 per level/semester: 70 Form of the course: on-site learning					
Number of credits: 4					
Recommended semester:					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 3					
A	B	C	D	E	FX
0,0	100,0	0,0	0,0	0,0	0,0
Lecturers: Mgr. Ambroz Almássy, PhD., Mgr. Iveta Kmentová, PhD., prof. Mgr. Radovan Šebesta, DrSc.					
Last change:					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KJ/N-bXCJ-120/19		Course title: Foreign language placement test			
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning					
Number of credits: 1					
Recommended semester: 1., 2..					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 414					
A	B	C	D	E	FX
99,28	0,0	0,0	0,0	0,48	0,24
Lecturers: PhDr. Jarmila Cihová, PhD., PhDr. Štefánia Dugovičová, PhD., Mgr. Barbara Kordíková, PhDr. Oľga Pažitková, CSc., Mgr. Stella Rizmanová, Mgr. Karin Rózsová Wolfová, RNDr. Tatiana Slováková, PhD.					
Last change: 08.01.2020					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KAgCh/N-bBCH-001/15		Course title: General and Inorganic Chemistry			
Educational activities: Type of activities: practicals / lecture / seminar Number of hours: per week: 5 / 4 / 4 per level/semester: 70 / 56 / 56 Form of the course: on-site learning					
Number of credits: 14					
Recommended semester: 1.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 39					
A	B	C	D	E	FX
12,82	35,9	25,64	10,26	10,26	5,13
Lecturers: prof. RNDr. Jozef Noga, DrSc., Dr. James Richard Asher, PhD., Mgr. Silvia Belušáková, PhD.					
Last change:					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KGe/N-bBCH-010/15		Course title: Genetics			
Educational activities: Type of activities: practicals / lecture Number of hours: per week: 2 / 4 per level/semester: 28 / 56 Form of the course: on-site learning					
Number of credits: 7					
Recommended semester: 3.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 31					
A	B	C	D	E	FX
3,23	12,9	12,9	41,94	29,03	0,0
Lecturers: doc. RNDr. Andrea Ševčovičová, PhD., doc. Mgr. Miroslava Slaninová, Dr., prof. RNDr. Ľubomír Tomáška, DrSc., doc. RNDr. Eliška Gálová, PhD., RNDr. Regina Sepšiová, PhD., Mgr. Ján Frankovský, prof. RNDr. Jozef Nosek, DrSc., Mgr. Katarína Gaplovská, PhD., Mgr. Lucia Mentelová, PhD., Mgr. Nina Mayerová					
Last change: 21.11.2019					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KJ/N-bXCJ-072/10		Course title: German 1			
Educational activities: Type of activities: seminar Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 3., 5.					
Educational level: I.					
Prerequisites: PriF.KJ/N-bXCJ-120/19 - Foreign language placement test					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 575					
A	B	C	D	E	FX
21,39	20,0	26,09	17,39	11,83	3,3
Lecturers: Mgr. Stella Rizmanová, Mgr. Karin Rózsová Wolfová					
Last change: 21.01.2020					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KJ/N-bXCJ-073/10		Course title: German 2			
Educational activities: Type of activities: seminar Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning					
Number of credits: 3					
Recommended semester: 4., 6.					
Educational level: I.					
Prerequisites: PriF.KJ/N-bXCJ-072/10 - German 1					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 563					
A	B	C	D	E	FX
25,4	21,49	26,29	16,52	6,93	3,37
Lecturers: Mgr. Stella Rizmanová, Mgr. Karin Rózsová Wolfová					
Last change: 21.01.2020					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KJ/N-bXCJ-096/10		Course title: German 3			
Educational activities: Type of activities: seminar Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 3., 5.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 91					
A	B	C	D	E	FX
87,91	7,69	2,2	0,0	1,1	1,1
Lecturers: Mgr. Stella Rizmanová, Mgr. Karin Rózsová Wolfová					
Last change: 15.01.2020					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KJ/N-bXCJ-097/10		Course title: German 4			
Educational activities: Type of activities: seminar Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 4., 6.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 66					
A	B	C	D	E	FX
87,88	10,61	1,52	0,0	0,0	0,0
Lecturers: Mgr. Stella Rizmanová, Mgr. Karin Rózsová Wolfová					
Last change: 21.01.2020					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KPI/N-bEXX-116/19		Course title: Globálne problémy životného prostredia			
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning					
Number of credits: 3					
Recommended semester: 2., 4., 6.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 214					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
Lecturers: RNDr. Martina Zvaríková, PhD., RNDr. Ľubomír Jurkovič, PhD., prof. RNDr. Pavel Dlapa, PhD., doc. RNDr. Katarína Pavličková, CSc.					
Last change: 18.09.2019					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KEM/N-bXXX-001/19		Course title: Green University 1			
Educational activities: Type of activities: practicals / seminar Number of hours: per week: 2 / 2 per level/semester: 28 / 28 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 1., 2., 3., 4., 5., 6..					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 5					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
Lecturers: RNDr. Jaroslav Bella, doc. Mgr. Miroslava Slaninová, Dr., RNDr. Hubert Žarnovičan, PhD., Mgr. Martin Šebesta, PhD.					
Last change: 11.02.2020					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KEM/N-bXXX-002/19		Course title: Green University 2			
Educational activities: Type of activities: practicals / seminar Number of hours: per week: 2 / 2 per level/semester: 28 / 28 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 1., 2., 3., 4., 5., 6..					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 3					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
Lecturers: RNDr. Jaroslav Bella, doc. Mgr. Miroslava Slaninová, Dr., Mgr. Martin Šebesta, PhD., RNDr. Hubert Žarnovičan, PhD.					
Last change: 11.02.2020					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KMB/N-bBCH-028/15		Course title: Human Genetics			
Educational activities: Type of activities: practicals / lecture Number of hours: per week: 3 / 2 per level/semester: 42 / 28 Form of the course: on-site learning					
Number of credits: 6					
Recommended semester: 5.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 20					
A	B	C	D	E	FX
45,0	20,0	25,0	0,0	0,0	10,0
Lecturers: prof. RNDr. Ľudevít Kádaši, DrSc., Mgr. Andrej Ficek, PhD., Mgr. Marián Baldovič, PhD.					
Last change:					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KMV/N-bBCH-015/15		Course title: Immunology			
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning					
Number of credits: 3					
Recommended semester: 4.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 36					
A	B	C	D	E	FX
19,44	16,67	25,0	16,67	22,22	0,0
Lecturers: doc. RNDr. Miroslava Šupolíková, PhD., doc. RNDr. Tatiana Betáková, DrSc.					
Last change: 10.12.2019					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava	
Faculty: Faculty of Natural Sciences	
Course ID: PriF.KAlCh/N-bBCH-036/15	Course title: Introduction to Bioanalysis
Educational activities: Type of activities: lecture / seminar Number of hours: per week: 1 / 1 per level/semester: 14 / 14 Form of the course: on-site learning	
Number of credits: 2	
Recommended semester: 5.	
Educational level: I.	
Prerequisites:	
Course requirements: There will be one running written test for 20 points, during the semester on seminars, and evaluation of seminar work for 20 points - in summary maximum 40 points. Final exam related to lecture topics will consist of 60-point test. For clarification of boundary test results it is possible to require additional oral answer to the question for maximum 4 points included. Overall grade will consist of summary evaluation of final exam, seminar test and seminar work according to formula $(0.6 \times \% \text{ final exam}) + (0.4 \times \% \text{ seminar test and seminar work}) = \text{resulting \%}$. For grade A, it is necessary to obtain at least 92 %, for grade B at least 84 %, for grade C at least 76 %, for grade D at least 68 % and for grade E at least 60 % of all points. Credits will not be assigned to a student, who will not earn at least 60% from seminar test and to student, who will not earn at least 60 % from final exam.	
Learning outcomes: Chemistry students will become familiar with the information about recent state of bioanalytical chemistry and with sampling techniques and methods of biological samples processing. The object is useful also for students of biochemistry or biology interested in analytical techniques devoted to investigation of wide range of biomolecules, e.g. hormones, amino acids, peptides,, proteins, nucleic acids, saccharides etc. The topic supports interdisciplinary character of bioanalysis through education in electrophoresis, liquid chromatography, mass spectrometry, biosensors, biotests, DNA and proteins sequenation, combination of PCR and analytical end methods. The content of the objective is complementary to the knowledge that is usually not involved in common textbooks on analytical chemistry. Student will be co-solver of case study problems from the field of biochemistry, biotechnology and the other natural science branches. Discussion of recent analytical methods possibilities in selected fields will take place also. The objective is taught in two forms. Theoretical aspects and calculus basics are taught by lectures and seminars, respectively.	
Class syllabus: Stručná osnova predmetu (Syllabus): 1. Definition of field of interest, problems, strategies, procedures, methods, applications and the state-of-art of bioanalysis in the science system of analytical chemistry. 2. Biologically distinct molecules and need of their determination in biological samples. 3. Specific properties and characteristics of biological samples (microbiological,	

biotechnological, plant, animal, food), sample stability and source of errors, sampling rules, storage, processing and pretreatment before measurement.

4. Clinical samples - blood, serum, plasma, urine, saliva, cerebrospinal fluid, tissues.
5. Diagnostic and clinical analysis. Utilization of biochemical and biological principles for the purpose of chemical analysis of selected substances.
6. Specific instrumentation requirements for bioanalysis.
7. Solid phase extraction in bioanalysis, biochromatography, denaturation chromatography, electroseparation methods, high resolution mass spectrometry. Specific requirements conditioned both by the character of biosamples and restrictions posed by their analysis.
8. Bioanalysis in genomics. Relations of bioseparation methods and PCR.
9. Molecular recognition – biotests, biosensors, DNA-Arrays. Nucleic acids - amplification and sequenation from the point-of-view of basic parameters of chemical analysis.
10. Bioanalysis in proteomics. Protein sequenation. Problems of validation in bioanalysis of biomacromolecules.
11. Chemical analysis of metabolites - metabolomics, metabolonomics. The other „omics“. Criteria for data processing and results interpretation in bioanalysis. Biological samples variability.
12. Trends in development of analytical instrumentation and equipment. Biocompatibility of construction materials. Analytical instrumentation and equipment sanitation and sterilization methods in bioanalysis. Seminar work.

Recommended literature:

Manz A, Pamme N., Iossifidi D., Bioanalytical Chemistry, Imperial College Press, London 2004; Evans G. (ed.) A Handbook of Bioanalysis and Drug Metabolism, CRC Press 2004; Mitchelson K., New High Throughput Technologies for DNA Sequencing and Genomics, Elsevier 2007; Venn R.F., Principles and Practice of Bioanalysis, CRC Press, 2003; www.analytika.sk

Actual information in scientific journals - Analytical and Bioanalytical Chemistry, Journal of Bioanalysis and Biomedicine, Bioseparation, Journal Chromatography B, Journal of Separation Science, Electrophoresis and others.

Languages necessary to complete the course:

English

Notes:

Past grade distribution

Total number of evaluated students: 9

A	B	C	D	E	FX
88,89	11,11	0,0	0,0	0,0	0,0

Lecturers: doc. RNDr. Marian Masár, PhD., prof. RNDr. Milan Hutta, CSc., Ing. Roman Szücs, PhD.

Last change: 09.01.2020

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KJCh/N-bBCH-039/15		Course title: Introduction to Nuclear Analyses			
Educational activities: Type of activities: lecture / seminar Number of hours: per week: 1 / 1 per level/semester: 14 / 14 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 4.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 19					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
Lecturers: RNDr. Dušan Galanda, PhD., RNDr. Jana Slimáková, PhD., RNDr. Eva Viglašová, PhD.					
Last change: 19.12.2019					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KDPP/N-bXDI-004/10		Course title: Introduction to Philosophy (1)			
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning					
Number of credits: 3					
Recommended semester: 5.					
Educational level: I.					
Prerequisites:					
Course requirements: participation, activity, homework or final essay					
Learning outcomes: Understanding of the basic concepts of systematic philosophy and the basic traditions of the history of philosophy.					
Class syllabus: Introduction of the basic concepts of philosophy. A review of the history of philosophy. The emergence of philosophy in antique Greece and its development. Plato and Aristotle. Chosen problems of systematic philosophy.					
Recommended literature: Tarnas, R.: The Passion of the Western Mind Anzenbacher, A.: Introduction to Philosophy					
Languages necessary to complete the course: slovak					
Notes:					
Past grade distribution Total number of evaluated students: 1668					
A	B	C	D	E	FX
50,48	35,97	13,01	0,36	0,18	0,0
Lecturers: Mgr. Štefan Zolcer, PhD.					
Last change: 19.09.2019					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KDPP/N-bXDI-005/10		Course title: Introduction to Philosophy (2)			
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning					
Number of credits: 3					
Recommended semester: 6.					
Educational level: I.					
Prerequisites:					
Course requirements: participation, activity, homework or final essay					
Learning outcomes: Understanding of the basic concepts of systematic philosophy and the basic traditions of the history of philosophy.					
Class syllabus: Introduction of the basic concepts of philosophy. A review of the history of philosophy. Reflections on the beginnings of modern scientific and philosophical thinking in early modern times and the development of modern philosophy. Chosen problems of systematic philosophy.					
Recommended literature: Tarnas, R.: The Passion of the Western Mind Anzenbacher, A.: Introduction to Philosophy Kuhn, T. S.: The Structure of Scientific Revolutions Rosenberg, A.: Philosophy of Science. A contemporary introduction					
Languages necessary to complete the course: slovak					
Notes:					
Past grade distribution Total number of evaluated students: 1352					
A	B	C	D	E	FX
49,85	33,14	16,12	0,37	0,44	0,07
Lecturers: Mgr. Štefan Zolcer, PhD.					
Last change: 19.09.2019					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KJ/N-bXCJ-094/10		Course title: Latin			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 1.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 464					
A	B	C	D	E	FX
42,24	20,69	13,36	5,17	6,25	12,28
Lecturers: PhDr. Štefánia Dugovičová, PhD., Mgr. Ivan Lábaj, PhD., Mgr. Barbara Kordíková					
Last change: 16.01.2020					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KJ/N-bXCJ-095/10		Course title: Latin			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 2.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 355					
A	B	C	D	E	FX
49,58	20,28	10,99	3,94	3,1	12,11
Lecturers: PhDr. Štefánia Dugovičová, PhD., Mgr. Ivan Lábaj, PhD., Mgr. Barbara Kordíková					
Last change: 16.01.2020					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava	
Faculty: Faculty of Natural Sciences	
Course ID: PriF.KJCh/N-bBCH-040/15	Course title: Legislation and Ethics
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning	
Number of credits: 3	
Recommended semester: 6.	
Educational level: I.	
Prerequisites:	
Course requirements: Grades will be based on the final exam discussion (contributing 100%). The course has a standardized grading system which is identified below: A (91 – 100%): Outstanding, excellent work (exceptional performance with strong evidence of original thinking and obvious capacity to analyze, synthesize and evaluate. B (81 – 90 %): Good, competent work; laudable performance with evidence of some original thinking, good problem-solving ability, exhibiting a serious, responsible engagement with the course content. C (73 – 80): Adequate, reasonably satisfactory work; fair performance but infrequent evidence of original thinking or the capacity to analyze, satisfies the minimum requirements of the course. D (66 – 72%): Less acceptable work; relatively weak performance with little evidence of original thinking or ability to analyze or synthesize course material. E (60 – 65%): Minimally acceptable work; very weak performance with little evidence of original thinking, showing inadequate grasp of some basic elements of the course. Fx (under 60%): Inadequate work; poor performance that indicates a lack of understanding or misunderstanding of essential subject matter.	
Learning outcomes: Students become aware of legislative and normative aspects of chemistry with emphasis of European legislation and international standards. After completing of course they should know the legal regulations concerning the handling of hazardous chemicals, health and environmental risks of toxic and radioactive substances, genetically modified organisms. They should know the quality management systems of laboratory activities, systems assurance and quality control of chemicals, pharmaceuticals and food.	
Class syllabus: • Chemical safety and biosafety – chemical safety assessment, EU laws on chemicals (REACH and CLP regulations), chemical safety cards, the Cartagena Protocol on biosafety • Toxicology – routes of entry of chemicals into the body, mechanism of action of toxic and very toxic substances on the body, the causes and symptoms of poisoning, biotransformation and excretion from the body • Radiation and safety – sources of radiation, biological effects of ionizing radiation, principles of radiation protection, application of the basic safety standards	

• Principles of good practice (GLP) – definitions of terms, Quality Assurance and GLP, Compliance of Laboratory Suppliers with GLP principles, the application of the GLP principles to non-clinical studies • Application of radioisotopes in biology, biochemistry and medicine • Threat of terrorism – chemical, biological and nuclear weapons • Basic rules for working with genetically modified organisms (GMO). Requirements for equipment to work with GMOs I. and II. category. • Eugenics - History and concept of Eugenics, the methods of implementing Eugenics, consequences of Eugenics at the end of World War II, Critics of Eugenics. • Reproductive cloning, Stem cells and therapeutic cloning and laws in different countries. • Analysis of the human genome and the ethical, legal, and social implications of genome research. • Bioethical aspects of animal welfare and legislation regulating the use of experimental animals in research. • Bioethical aspects of human assisted reproduction and end-of- life care and euthanasia. Legislations in different countries and recent development.					
Recommended literature:					
Languages necessary to complete the course: English					
Notes:					
Past grade distribution Total number of evaluated students: 21					
A	B	C	D	E	FX
38,1	61,9	0,0	0,0	0,0	0,0
Lecturers: RNDr. Oľga Rosskopfová, PhD., doc. RNDr. Stanislav Stuchlík, CSc., doc. RNDr. Anton Horváth, CSc., doc. Mgr. Miroslava Slaninová, Dr.					
Last change: 13.11.2019					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KIHG/N-bBCH-002/15		Course title: Mathematics			
Educational activities: Type of activities: practicals / lecture Number of hours: per week: 2 / 4 per level/semester: 28 / 56 Form of the course: on-site learning					
Number of credits: 8					
Recommended semester: 1.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 39					
A	B	C	D	E	FX
15,38	15,38	25,64	23,08	7,69	12,82
Lecturers: prof. RNDr. Roman Pašteka, PhD., RNDr. Roland Karcol, PhD.					
Last change: 31.12.2019					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KMB/N-bBCH-026/15		Course title: Methods in Molecular Biology			
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning					
Number of credits: 3					
Recommended semester: 5.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 16					
A	B	C	D	E	FX
25,0	12,5	25,0	18,75	18,75	0,0
Lecturers: Mgr. Andrea Šoltýsová, PhD., doc. RNDr. Hana Drahovská, PhD., doc. RNDr. Stanislav Stuchlík, CSc.					
Last change:					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KMV/N-bBCH-007/15		Course title: Microbiology			
Educational activities: Type of activities: practicals / lecture Number of hours: per week: 2 / 2 per level/semester: 28 / 28 Form of the course: on-site learning					
Number of credits: 5					
Recommended semester: 2.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 36					
A	B	C	D	E	FX
13,89	19,44	30,56	19,44	13,89	2,78
Lecturers: prof. RNDr. Helena Bujdáková, CSc., prof. RNDr. Yvetta Gbelská, CSc., RNDr. Jaroslava Dekkerová, PhD., Mgr. Barbora Radochová, PhD., RNDr. Kamila Koči, PhD.					
Last change: 20.12.2019					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KMB/N-bBCH-011/15		Course title: Molecular Biology			
Educational activities: Type of activities: practicals / lecture Number of hours: per week: 2 / 4 per level/semester: 28 / 56 Form of the course: on-site learning					
Number of credits: 7					
Recommended semester: 3.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 31					
A	B	C	D	E	FX
16,13	9,68	22,58	32,26	6,45	12,9
Lecturers: prof. RNDr. Ján Turňa, CSc., RNDr. Ján Krahulec, PhD., Mgr. Michal Kajsik, PhD., Mgr. Zdenko Levarski, PhD.					
Last change:					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KOrCh/N-bBCH-034/15		Course title: Molecular Spectroscopy			
Educational activities: Type of activities: practicals / lecture / seminar Number of hours: per week: 1 / 2 / 2 per level/semester: 14 / 28 / 28 Form of the course: on-site learning					
Number of credits: 6					
Recommended semester: 5.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 4					
A	B	C	D	E	FX
25,0	50,0	25,0	0,0	0,0	0,0
Lecturers: prof. Mgr. Radovan Šebesta, DrSc., Mgr. Ambroz Almásy, PhD., Mgr. Juraj Filo, PhD., RNDr. Marek Cigáň, PhD.					
Last change: 30.11.2019					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KOrCh/N-bBCH-005/15		Course title: Organic Chemistry			
Educational activities: Type of activities: practicals / lecture / seminar Number of hours: per week: 5 / 4 / 2 per level/semester: 70 / 56 / 28 Form of the course: on-site learning					
Number of credits: 11					
Recommended semester: 2.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 27					
A	B	C	D	E	FX
18,52	3,7	22,22	18,52	25,93	11,11
Lecturers: prof. Mgr. Radovan Šebesta, DrSc., Mgr. Iveta Kmentová, PhD., Mgr. Ambroz Almássy, PhD.					
Last change: 30.11.2019					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KOrCh/N-bCOV-007/19		Course title: Organic Chemistry			
Educational activities: Type of activities: lecture / seminar Number of hours: per week: 4 / 2 per level/semester: 56 / 28 Form of the course: on-site learning					
Number of credits: 7					
Recommended semester: 2.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 6					
A	B	C	D	E	FX
16,67	0,0	16,67	33,33	33,33	0,0
Lecturers: Mgr. Ambroz Almássy, PhD., Mgr. Iveta Kmentová, PhD., prof. Mgr. Radovan Šebesta, DrSc.					
Last change:					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KOrCh/N-bBCH-033/15		Course title: Organic Chemistry 2			
Educational activities: Type of activities: practicals / lecture / seminar Number of hours: per week: 3 / 2 / 1 per level/semester: 42 / 28 / 14 Form of the course: on-site learning					
Number of credits: 6					
Recommended semester: 6.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 2					
A	B	C	D	E	FX
0,0	0,0	0,0	0,0	50,0	50,0
Lecturers: doc. RNDr. Martin Putala, CSc.					
Last change: 29.11.2019					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KOrCh/N-bBCH-035/15		Course title: Organic Synthesis			
Educational activities: Type of activities: lecture / seminar Number of hours: per week: 2 / 1 per level/semester: 28 / 14 Form of the course: on-site learning					
Number of credits: 4					
Recommended semester: 5.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 3					
A	B	C	D	E	FX
0,0	33,33	66,67	0,0	0,0	0,0
Lecturers: doc. RNDr. Peter Magdolen, PhD.					
Last change: 27.11.2019					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KFTCh/N-bBCH-042/15		Course title: Physical Chemistry			
Educational activities: Type of activities: practicals / lecture / seminar Number of hours: per week: 5 / 4 / 2 per level/semester: 70 / 56 / 28 Form of the course: on-site learning					
Number of credits: 11					
Recommended semester: 5.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 18					
A	B	C	D	E	FX
16,67	22,22	33,33	11,11	16,67	0,0
Lecturers: prof. RNDr. Juraj Bujdák, DrSc., doc. Ing. Marián Janek, PhD., RNDr. Erik Szabó, PhD.					
Last change: 10.12.2019					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KTV/N-bXTV-104/18		Course title: Physical Education			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning					
Number of credits: 1					
Recommended semester: 4.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 281					
A	B	C	D	E	FX
99,29	0,0	0,71	0,0	0,0	0,0
Lecturers: Mgr. Kristína Vanýsková, PaedDr. Vladimír Hubka, Mgr. Miriam Kirchmayerová, PhD., Mgr. Ján Krošlák, Mgr. Martin Mokošák, PhD., Mgr. Igor Remák, PhD., PaedDr. Mgr. Lenka Vandáková					
Last change:					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KTV/N-bXTV-101/18		Course title: Physical Education 1			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning					
Number of credits: 1					
Recommended semester: 1.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 856					
A	B	C	D	E	FX
99,07	0,7	0,0	0,0	0,0	0,23
Lecturers: Mgr. Kristína Vanýsková, PaedDr. Vladimír Hubka, Mgr. Miriam Kirchmayerová, PhD., Mgr. Ján Krošlák, Mgr. Martin Mokošák, PhD., Mgr. Igor Remák, PhD., PaedDr. Mgr. Lenka Vandáková					
Last change:					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KTV/N-bXTV-102/18		Course title: Physical Education 2			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning					
Number of credits: 1					
Recommended semester: 2.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 512					
A	B	C	D	E	FX
99,8	0,0	0,0	0,0	0,0	0,2
Lecturers: Mgr. Kristína Vanýsková, PaedDr. Vladimír Hubka, Mgr. Miriam Kirchmayerová, PhD., Mgr. Ján Krošlák, Mgr. Martin Mokošák, PhD., Mgr. Igor Remák, PhD., PaedDr. Mgr. Lenka Vandáková					
Last change:					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KTV/N-bXTV-103/18		Course title: Physical Education 3			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning					
Number of credits: 1					
Recommended semester: 3.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 369					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
Lecturers: Mgr. Kristína Vanýsková, PaedDr. Vladimír Hubka, Mgr. Miriam Kirchmayerová, PhD., Mgr. Ján Krošlák, Mgr. Martin Mokošák, PhD., Mgr. Igor Remák, PhD., PaedDr. Mgr. Lenka Vandáková					
Last change:					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KTV/N-bXTV-105/18		Course title: Physical Education 5			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning					
Number of credits: 1					
Recommended semester: 5.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 230					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
Lecturers: Mgr. Kristína Vanýsková, PaedDr. Vladimír Hubka, Mgr. Miriam Kirchmayerová, PhD., Mgr. Ján Krošlák, Mgr. Martin Mokošák, PhD., Mgr. Igor Remák, PhD., PaedDr. Mgr. Lenka Vandáková					
Last change:					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KTV/N-bXTV-106/18		Course title: Physical Education 6			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning					
Number of credits: 1					
Recommended semester: 6.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 173					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
Lecturers: Mgr. Kristína Vanýsková, PaedDr. Vladimír Hubka, Mgr. Miriam Kirchmayerová, PhD., Mgr. Ján Krošlák, Mgr. Martin Mokošák, PhD., Mgr. Igor Remák, PhD., PaedDr. Mgr. Lenka Vandáková					
Last change:					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KIHG/N-bBCH-003/15		Course title: Physics			
Educational activities: Type of activities: practicals / lecture Number of hours: per week: 2 / 4 per level/semester: 28 / 56 Form of the course: on-site learning					
Number of credits: 7					
Recommended semester: 2.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 34					
A	B	C	D	E	FX
44,12	32,35	11,76	5,88	0,0	5,88
Lecturers: prof. RNDr. Roman Pašteka, PhD., RNDr. Roland Karcol, PhD.					
Last change: 31.12.2019					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava	
Faculty: Faculty of Natural Sciences	
Course ID: PriF.KBCh/N-bBCH-018/15	Course title: Practical Training
Educational activities: Type of activities: practice Number of hours: per week: per level/semester: 3t Form of the course: on-site learning	
Number of credits: 6	
Recommended semester: 4.	
Educational level: I.	
Prerequisites:	
Course requirements: Grades will be based on the final practical training report (contributing 100%), which has a standardized grading system identified below: A (91 – 100%): Outstanding, excellent work (exceptional performance with strong evidence of original thinking and obvious capacity to analyze, synthesize and evaluate. B (81 – 90 %): Good, competent work; laudable performance with evidence of some original thinking, good problem-solving ability, exhibiting a serious, responsible engagement with the course content. C (73 – 80%): Adequate, reasonably satisfactory work; fair performance but infrequent evidence of original thinking or the capacity to analyze, satisfies the minimum requirements of the course. D (66 – 72%): Less acceptable work; relatively weak performance with little evidence of original thinking or ability to analyze or synthesize course material. E (60 – 65%): Minimally acceptable work; very weak performance with little evidence of original thinking, showing inadequate grasp of some basic elements of the course. Fx (under 60%): Inadequate work; poor performance that indicates a lack of understanding or misunderstanding of essential subject matter.	
Learning outcomes: Practical Training is an integral part of the Biological Chemistry program. During practice, students will improve their skill in modern laboratory techniques and expand their theoretical knowledge in the study area and enables close collaboration with professional research groups.	
Class syllabus: The course represents three weeks of practical work after passing the exams in the summer semester. Students participating in the course of real research conducted in laboratories of Comenius University, Slovak Academy of Sciences and private research institutions led by experts working in the biological or chemical fields.	
Recommended literature: Specifically, as recommended by supervisor	
Languages necessary to complete the course: English	
Notes:	

Past grade distribution					
Total number of evaluated students: 21					
A	B	C	D	E	FX
95,24	0,0	4,76	0,0	0,0	0,0
Lecturers: doc. RNDr. Anton Horváth, CSc., prof. RNDr. Vladimír Kováč, CSc.					
Last change: 13.11.2019					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KIHG/N-bGXX-002/19		Course title: Practice-oriented geology for all			
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning					
Number of credits: 3					
Recommended semester: 2., 4., 6.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 10					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
Lecturers: doc. RNDr. Renáta Fláková, PhD., doc. RNDr. Dávid Krčmář, PhD., RNDr. Ivana Ondřejková, PhD., doc. RNDr. Renáta Adamcová, PhD., doc. RNDr. Martin Bednarik, PhD., RNDr. Tatiana Durmeková, PhD., doc. Mgr. Vladimír Greif, PhD., Mgr. Rudolf Tornyai, PhD.					
Last change: 15.05.2021					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KJ/N-bXCJ-110/15		Course title: Professional English 1			
Educational activities: Type of activities: seminar Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 1.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 62					
A	B	C	D	E	FX
62,9	20,97	12,9	0,0	0,0	3,23
Lecturers: PhDr. Jarmila Cihová, PhD., RNDr. Tatiana Slováková, PhD.					
Last change: 08.01.2020					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KJ/N-bXCJ-111/15		Course title: Professional English 2			
Educational activities: Type of activities: seminar Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 2.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 47					
A	B	C	D	E	FX
61,7	25,53	8,51	0,0	0,0	4,26
Lecturers: PhDr. Jarmila Cihová, PhD., Mgr. Barbara Kordíková, RNDr. Tatiana Slovákova, PhD.					
Last change: 08.01.2020					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KJCh/N-bBCH-037/15		Course title: Radiation Hygiene and Safety			
Educational activities: Type of activities: lecture / seminar Number of hours: per week: 1 / 1 per level/semester: 14 / 14 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 5.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 2					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
Lecturers: doc. RNDr. Silvia Dulanská, PhD., RNDr. Dušan Galanda, PhD.					
Last change: 19.12.2019					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KMB/N-bBCH-025/15		Course title: Regulation of Gene Expression			
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning					
Number of credits: 3					
Recommended semester: 5.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 16					
A	B	C	D	E	FX
50,0	12,5	12,5	6,25	18,75	0,0
Lecturers: prof. RNDr. Ján Turňa, CSc., Mgr. Michal Kajsik, PhD., Mgr. Zdenko Levarski, PhD., RNDr. Katarína Šoltys, PhD.					
Last change:					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KDPP/N-bXDI-006/10		Course title: Rhetoric			
Educational activities: Type of activities: lecture / seminar Number of hours: per week: 1 / 1 per level/semester: 14 / 14 Form of the course: on-site learning					
Number of credits: 3					
Recommended semester: 1., 2., 3., 4., 5., 6..					
Educational level: I.					
Prerequisites:					
Course requirements: participation, activity, eventually final essay Scale of assessment (preliminary/final): Continuously 70% / during the examination period 30%					
Learning outcomes: The aim of the course is to teach students to adequately articulate their ideas, to express their attitudes and opinions, to use argumentation, think critically, to communicate adequately, and to listen or read with understanding.					
Class syllabus: Except the introductory lectures, the course is conceived as seminars with discussions on chosen topics.					
Recommended literature: Aristoteles: Rétorika. Bratislava: Thetis, 2009. Recommended sources are given to each topic separately.					
Languages necessary to complete the course: Slovak					
Notes:					
Past grade distribution Total number of evaluated students: 1410					
A	B	C	D	E	FX
50,43	36,95	10,28	1,49	0,5	0,35
Lecturers: Mgr. Štefan Zolcer, PhD.					
Last change: 18.09.2019					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KMB/N-bBCH-027/15		Course title: Seminar on Methods in Molecular Biology			
Educational activities: Type of activities: seminar Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 5.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 13					
A	B	C	D	E	FX
38,46	7,69	23,08	15,38	15,38	0,0
Lecturers: Mgr. Andrea Šoltýsová, PhD., doc. RNDr. Hana Drahovská, PhD.					
Last change:					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KOrCh/N-bBCH-006/15		Course title: Seminar on Organic Chemistry			
Educational activities: Type of activities: seminar Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 2.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 28					
A	B	C	D	E	FX
25,0	10,71	17,86	32,14	14,29	0,0
Lecturers: Mgr. Ambroz Almásky, PhD.					
Last change: 30.11.2019					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KMB/N-bBCH-030/15		Course title: Seminar on Topics in DNA Analysis Methods			
Educational activities: Type of activities: seminar Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 6.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 12					
A	B	C	D	E	FX
33,33	16,67	8,33	0,0	41,67	0,0
Lecturers: Mgr. Andrea Šoltýsová, PhD., doc. RNDr. Hana Drahovská, PhD.					
Last change:					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava	
Faculty: Faculty of Natural Sciences	
Course ID: PriF.KAlCh/N-bBCH-014/15	Course title: Separation Methods
Educational activities: Type of activities: lecture / seminar Number of hours: per week: 2 / 1 per level/semester: 28 / 14 Form of the course: on-site learning	
Number of credits: 4	
Recommended semester: 5.	
Educational level: I.	
Prerequisites:	
Course requirements: There will be one running written test for 20 points, during the semester on seminars. Only student obtaining from the test minimum 60% will pass to final exam test. Experimental laboratory work will be graded as follows: continuous compounding will be evaluated by 20 points maximum involving theoretical preparation for laboratory work, activity and quality of results in the experimental work summarized in laboratory protocol. Final test from topics of laboratory will be enabled only to student who submitted protocols from all done laboratory experiments - student can get maximum 20 points, in summary max. 40 points for experimental laboratory work. Only those students will be admitted to final examination who achieve at least 60% of the points from seminar tests and laboratory work evaluation. Final exam related to lecture topics will consist of 40-point test. For clarification of boundary test results it is possible to require additional oral answer to the question for maximum 4 points included. Overall grade will consist of summary evaluation of final exam, seminar tests and experimental work according to formula $(0.4 \times \% \text{ final exam}) + (0.2 \times \% \text{ seminar tests}) + (0.4 \times \% \text{ laboratory work}) = \text{resulting \%}$. For grade A, it is necessary to obtain at least 92 %, for grade B at least 84 %, for grade C at least 76 %, for grade D at least 68 % and for grade E at least 60 % of all points. Credits will not be assigned to a student, who will not earn at least 60% from running tests, or who will not earn at least 60% from laboratory work and to student, who will not earn at least 60 % from final exam.	
Learning outcomes: Chemistry students will become familiar with the information about recent state of separation methods within the system of scientific cognition of material reality and their unavoidable need for generation of interpretable analytical signal. For the purpose of education separation methods we utilize unified approach based on concepts of transport and distribution phenomena that are of use in modern separation methods. Separation methods create frequently basis of chemical analysis methods. They are also base for qualitative evidence and quantitative measurement of characteristics or determination of chemical substances utilized in various human activities and associated control, e.g. analysis of technology products, bioanalysis, analysis of substances in environment, clinical analysis and diagnostics etc. Student will get information related to classification of analytical, preparative and industrial separation processes and methods, respectively. Calculus from separation science beside case study of model situations of daily praxis is the component part of the objective. Theoretical knowledge and calculus basics are taught via	

lectures and seminars, respectively. Vital part of the objective is also instrumental experimental work in the laboratory.

Class syllabus:

1. Characteristics of separation methods, their function and importance in analytical, preparative and industrial procedures and processes; separation methods based on differences in phase distribution of separated components; separation methods based on differences in velocity of migration of separated components in various fields of force; separation methods based on differences in velocity of separated components permeating through semipermeable membranes.
2. General terms, concepts, terminology characterizing extent of separation; distribution ratio, distribution constant, Nernst distribution law, chemical equilibrium in separation process. Interactions in separation systems. Calculus, thermodynamic and kinetic aspects of separation methods, relation of terms separation and resolution.
3. One-stage separation methods, principle, technique and application; separation by precipitation, co-precipitation. Sublimation, lyophilisation. Electroprecipitation, electrolytic deposition. Extraction separation in the system solid phase-liquid, selective leaching, liquid – liquid extraction, cloud-point extraction – micellar systems. Membrane extraction. Salting-out. Simple distillation. Zone melting.
4. Multi-steps separation methods and introduction to chromatographic methods. Multi-stage liquid-liquid extraction, principle of continuous extraction. Multi-stage distillation. Chromatographic separation, classification according to various criteria. Theory of chromatographic phenomena, qualitative and quantitative chromatographic analysis – unified approach.
5. High-resolution gas chromatography (HRGC). Instrumentation in GC. Separation mechanism in GC. Optimization of separation in GC. Advanced techniques. Reaction chromatography, pre-column derivatization, vacant GC. GC-MS. Computing simulations and calculus.
6. High-performance liquid chromatography (HPLC). Instrumentation in HPLC, column vs. planar techniques, computing simulations and calculus. Chromatogram interpretation. Chromatographic phase systems in LC (HPLC, TLC). Advanced techniques. Separation mechanism in HPLC. Pre-column and post-column derivatization (physical, chemical and biological). Typical application of chromatographic methods.
7. Separation of substances by field of force utilization. Electroseparation methods. Principles of action, classification, parameters characterizing electroseparation. Concept of ionic mobility, separation mechanism, column vs. planar techniques, column- coupling technique and detection. Zone electrophoresis. Separations in free solution of carrier electrolyte. Separations in micelle forming solutions, electroosmotic flow, micellar electrokinetic chromatography (MEKC). Basics, instrumentation and practical utilization of computing simulation techniques.
8. Capillary isotachopheresis (cITP) and isoelectric focusing (IEF). Basic principles of ITP, instrumentation and computing simulation technique, analytical signal- isotachopherogram. Basis principles of IEF, instrumentation and computing simulation technique, separation and analysis of proteins.
9. Chip-based electroseparation. Miniaturization of separation columns and channels. Instrumentation and novel approaches to electroseparations. Advance and application of chip-based electroseparations.
10. Mass spectrometry as separation method (MS-MS). Classification of MS methods from point-of view of ions separation in vacuum. Sedimentation separation. Centrifugal separation. Centrifugal field flow fractionation (FFF) – principle and application areas.
11. Membrane separations. Principles, classification. Dialysis and electrodialysis, principle, instrumentation and usage. Ultrafiltration – utilisation in analytical procedures. Gas permeation through membranes. Validation of analytical methods focused to separation methods.

12. Solution of case study examples from various fields of social and productive praxis. Typical utilization of separation methods in analytical procedures, preparative and industrial scale procedures. Application of separations in FIA, SIA and autoanalyzers (clinical diagnostics). 13. Future trends in development of separation methods. Laboratory experiments: 1. Computing simulations of basic separation process in gas chromatography. Simulation of individual contributions of dispersion parameters. Optimisation of separation of components of gas mixture. Van Deemter equation. Capillary gas chromatography. Qualitative and quantitative GC analysis. Calculus of separation parameters of model mixtures (separation of components of hydrocarbon gas). Separation and determination of volatile organic contaminants in water by capillary GC (determination BTEX in water, headspace concentration fast analysis). 2. Computing simulations of basic separation process in liquid chromatography. Simulation of individual contributions of dispersion parameters. Optimisation of HPLC analysis of liquid mixture. Van Deemter equation and H-u curves. Gel chromatography. Column liquid chromatography. Qualitative and quantitative LC analysis. Calculus of separation parameters of model mixtures (separation of phenols and phenolic acids, fast analysis). Partial validation of LC methods. Separation and determination of selective medical drugs by HPLC (analysis of pills and determination of paracetamol, guaifenesin, acetylsalicylic acid). 3. Computing simulations of basic separation process in capillary electrophoresis. Simulation of individual contributions of dispersion parameters. Optimisation of operational parameters in capillary electrophoresis. Qualitative and quantitative analysis. Calculus of separation parameters in capillary zone electrophoresis, isotachopheresis and isoelectric focusing in model mixtures. Separation and determination of food additives and contaminants in food by capillary electrophoresis. Centrifugal separation. 4. Electroseparations using chips. Basic differences among separations in macro- and micro-scale. Analysis of body fluids by chip electrophoresis. 5. Liquid-liquid extraction separation, solid-phase extraction (SPE), cloud-point extraction and micelle-forming systems. Ultrafiltration, dialysis, separation of low molecular mass and high molecular mass substances. 6. Mass spectrometry as separation method. FIA mode in MS. Experiment, animation and simulation.					
Recommended literature:					
Languages necessary to complete the course: English					
Notes:					
Past grade distribution Total number of evaluated students: 6					
A	B	C	D	E	FX
83,33	0,0	0,0	16,67	0,0	0,0
Lecturers: prof. RNDr. Milan Hutta, CSc., doc. RNDr. Marian Masár, PhD., Ing. Roman Szücs, PhD.					
Last change: 09.01.2020					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava	
Faculty: Faculty of Natural Sciences	
Course ID: PriF.KBCh/N-bBCH-023/15	Course title: Structure and Functions of Biomolecules
Educational activities: Type of activities: lecture / seminar Number of hours: per week: 2 / 1 per level/semester: 28 / 14 Form of the course: on-site learning	
Number of credits: 4	
Recommended semester: 6.	
Educational level: I.	
Prerequisites:	
Course requirements: Presence at seminars. Obtaining 50% of both parts is a prerequisite for successful completion of the subject. Scale of assessment (preliminary/final): Assessment from the seminar will be 30% and written test at the end of Lecture course 50% of the total subject assessment.	
Learning outcomes: This course covers the background necessary to the knowledge of biomolecules (proteins and nucleic acids). Students repeat understanding of the protein structure, thermodynamics and kinetics of biochemical processes and different ways of regulating enzyme activities and metabolic processes at all. Students also deal with molecules of DNA and RNA – their structure, transcription and translation. The emphasis is on interactions between nucleic acids and proteins.	
Class syllabus: 1. Structural components of proteins - amino acids - properties, peptide bond formation, reactions in biochemistry - thermodynamics of chemical reactions, the transition state of a chemical reaction, non-covalent interactions. 2. Steady-state kinetics of the one substrate reaction; time course of enzyme-catalyzed reactions. Michaelis-Menten equation and its transformation, enzyme inhibition. Experimental measurement of enzyme activity; detection methods, factors affecting the rate of enzyme reaction, enzyme stability. Enzyme reactions with multiple substrates. 3. Mechanisms of enzyme catalysis. Examples of mechanisms of enzymatic catalysis and its regulation - serine proteases, aspartic acid proteases, glutathione reductase, hexokinase, lysozyme. 4. Lipids - Functional roles of lipids in membranes. Phospholipid synthesis and catabolism. Intramembrane and intermembrane lipid transport. Lipid modification of proteins. Approaches to lipid analysis. 5. Carbohydrates – Glycogen: structure, function, metabolism and regulation in animals; Cell wall polysaccharides of bacteria and plants: structure, function, biosynthesis. Methods of carbohydrate analysis. 6. Regulation of gene expression, initiation of RNA transcription, gene regulatory proteins (a.k.a. transcription factors) and their binding to DNA, DNA structures as target for regulatory proteins (e.g. helix-turn-helix, leucine zipper, helix-loop-helix, zinc fingers). 7. Biological relevance of DNA and RNA modification - methylation of CpG islands, N6-methyladenosine in mRNA, tRNA modifications and translation. 8. Enzyme regulation - zymogens,	

isoenzymes, covalent modification, allosteric enzymes. Enzyme Engineering - stabilization of enzymes, change the properties of enzymes by gene manipulations.

Recommended literature:

Berg, J. M, Tymoczko, J. L, Gatto, Jr., G. J., Stryer, L. (2015). Biochemistry, 8th Edition, W. H. Freeman and Company (The 7th edition is also sufficient)

Nelson, D. L., Cox, M. M. (2017). Lehninger Principles of Biochemistry, 7th Edition, W. H. Freeman, Macmillan Learning (The 6th edition is also sufficient)

Languages necessary to complete the course:

English

Notes:

Past grade distribution

Total number of evaluated students: 22

A	B	C	D	E	FX
18,18	31,82	9,09	27,27	13,64	0,0

Lecturers: doc. RNDr. Anton Horváth, CSc., doc. RNDr. Jana Korduláková, PhD., doc. RNDr. Marek Mentel, PhD., doc. RNDr. Katarína Mikušová, DrSc., Ing. Martina Neboháčová, PhD., RNDr. Ingrid Sveráková, PhD., Mgr. Stanislav Huszár, PhD.

Last change: 13.11.2019

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KTV/N-bUXX-205/15		Course title: Summer physic-educational meeting 2			
Educational activities: Type of activities: other Number of hours: per week: per level/semester: 7d Form of the course: on-site learning					
Number of credits: 1					
Recommended semester: 2., 4.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 250					
A	B	C	D	E	FX
99,2	0,0	0,0	0,0	0,0	0,8
Lecturers: Mgr. Kristína Vanýsková					
Last change:					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KMB/N-bBCH-041/15		Course title: Theoretical and experimental medicine			
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning					
Number of credits: 3					
Recommended semester: 5.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 23					
A	B	C	D	E	FX
4,35	17,39	21,74	34,78	13,04	8,7
Lecturers: doc. RNDr. Ing. Peter Celec, DrSc., Mgr. Veronika Borbélyová, PhD., doc. RNDr. Ľubomíra Tóthová, PhD., doc. MUDr. RNDr. Roman Gardlík, PhD., RNDr. Barbora Vlková, PhD., Mgr. Barbora Konečná, PhD., Mgr. Michal Pastorek, PhD.					
Last change:					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KMB/N-bBCH-029/15		Course title: Topics in DNA Analysis Methods			
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning					
Number of credits: 3					
Recommended semester: 6.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 12					
A	B	C	D	E	FX
33,33	16,67	8,33	33,33	8,33	0,0
Lecturers: Mgr. Andrea Šoltýsová, PhD., doc. RNDr. Hana Drahovská, PhD., doc. RNDr. Stanislav Stuchlík, CSc.					
Last change:					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KMV/N-bBCH-008/15		Course title: Virology			
Educational activities: Type of activities: practicals / lecture Number of hours: per week: 2 / 2 per level/semester: 28 / 28 Form of the course: on-site learning					
Number of credits: 5					
Recommended semester: 2.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 46					
A	B	C	D	E	FX
13,04	36,96	17,39	26,09	6,52	0,0
Lecturers: doc. RNDr. František Golais, CSc., doc. RNDr. Peter Kabát, CSc., doc. RNDr. Tatiana Betáková, DrSc., PhDr. Eva Nováková					
Last change: 07.01.2020					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KTV/N-bUXX-201/00		Course title: Winter physic-educational meeting			
Educational activities: Type of activities: other Number of hours: per week: per level/semester: 7d Form of the course: on-site learning					
Number of credits: 1					
Recommended semester: 1., 3., 5.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 460					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
Lecturers: Mgr. Martin Mokošák, PhD.					
Last change: 02.06.2015					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava					
Faculty: Faculty of Natural Sciences					
Course ID: PriF.KPI/N-bEXX-115/19		Course title: Človek ako súčasť prírody			
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning					
Number of credits: 3					
Recommended semester: 1., 3., 5.					
Educational level: I.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 242					
A	B	C	D	E	FX
96,28	0,0	0,0	0,0	0,0	3,72
Lecturers: prof. RNDr. Pavel Dlapa, PhD., doc. RNDr. Katarína Pavličková, CSc., RNDr. Martina Zvaríková, PhD., RNDr. Ľubomír Jurkovič, PhD., Mgr. Tomáš Lánczos, PhD.					
Last change: 18.09.2019					
Approved by:					