

Course descriptions

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COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJFB/2-FJF-204/15		Course title: Applied Nuclear Physics			
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 3 / 1 per level/semester: 39 / 13 Form of the course: on-site learning					
Number of credits: 5					
Recommended semester: 3.					
Educational level: II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 35					
A	B	C	D	E	FX
45,71	31,43	8,57	5,71	5,71	2,86
Lecturers: doc. RNDr. Karol Holý, CSc., RNDr. Radoslav Böhm, PhD.					
Last change: 02.06.2015					
Approved by:					

STATE EXAM DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJFB/2-FJF-957/15	Course title: Applied Nuclear Physics
Number of credits: 2	
Educational level: II.	
State exam syllabus:	
Last change: 02.06.2015	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJFB/2-FJF-238/00		Course title: Biological Effects of Ionizing Radiation			
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 3					
Recommended semester: 4.					
Educational level: II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus: The temporal course of radiation effects. Cellular and subcellular radiobiology. Theories and models for cell survival. Radiation effects of particles with high linear energy transfer (LET, Bragg peak, dependence RBE on LET, direct and indirect action, fractionation of exposure). Late effects of radiation on tissue (stochastic and nonstochastic effects). Radiation biology of normal and neoplastic tissue systems.					
Recommended literature: Alpen E.L.: Radiation Biophysics, Academic Press, San Diego, 1998 Nias A.H.W.: An introduction to radiobiology, Wiley, Chichester, 2000 Alberts B., Bray D., Lewis J., Raff M., Roberts K., Watson J.D.: Molecular Biology of the Cell, Garland Publ., NY 1994					
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: RNDr. Radoslav Böhm, PhD.					
Last change: 22.02.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJFB/2-FJF-230/15		Course title: Computer Networks			
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 3					
Recommended semester: 3.					
Educational level: II.					
Prerequisites:					
Antirequisites: FMFI.KJFB/2-FJF-230/00					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 1					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
Lecturers: prof. RNDr. Stanislav Tokár, DrSc., RNDr. Tibor Ženiš, PhD.					
Last change: 02.06.2015					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJFB/2-FJF-236/00	Course title: Detection Methods in High Energy Physics
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning	
Number of credits: 3	
Recommended semester: 3.	
Educational level: II.	
Prerequisites:	
Course requirements:	
Learning outcomes: The course will cover the physics of particle detectors. It will introduce the experimental techniques used in nuclear, particle physics and photon science, and describe the layout and functionality of modern experiments.	
Class syllabus: <ol style="list-style-type: none"> 1. Introductions to instruments for high-energy physics 2. Interaction of Particles with Matter 3. Gaseous detectors 4. Scintillators detectors 5. Solid state detectors 6. Detectors using transition radiation 7. Readout electronics 8. Tracking 9. EM and Hadron calorimeters 10. Particle identifications 11. Complex detector systems 12. Detectors of high energy particles in space research 	
Recommended literature: C. Grupen, B. Shwartz, Particle Detectors, Cambridge University Press, 2011, s. 676 C. Grupen,, I.Buvat, Handbook of particle detection and imaging, vol. 1 and vol.2, Springer, 2012, s. 1227 S. Biswas, S. Das, S. K. Ghosh, Advanced Detectors for Nuclear, High Energy and Astroparticle Physics, Springer, 2018, s. 229	
Languages necessary to complete the course:	
Notes:	

Past grade distribution					
Total number of evaluated students: 45					
A	B	C	D	E	FX
68,89	22,22	4,44	4,44	0,0	0,0
Lecturers: Mgr. Michal Mereš, PhD.					
Last change: 20.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJFB/2-FJF-910/00		Course title: Diploma Thesis (1)			
Educational activities: Type of activities: independent work Number of hours: per week: 3 per level/semester: 39 Form of the course: on-site learning					
Number of credits: 3					
Recommended semester: 2.					
Educational level: II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus: Student works according to instructions given by his/her diploma supervisor.					
Recommended literature: Recommended by diploma supervisor.					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 84					
A	B	C	D	E	FX
90,48	4,76	4,76	0,0	0,0	0,0
Lecturers: prof. RNDr. Jozef Masarik, DrSc.					
Last change: 02.06.2015					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJFB/2-FJF-911/00		Course title: Diploma Thesis (2)			
Educational activities: Type of activities: independent work Number of hours: per week: 5 per level/semester: 65 Form of the course: on-site learning					
Number of credits: 5					
Recommended semester: 3.					
Educational level: II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus: Student works according to instructions given by his/her diploma supervisor.					
Recommended literature: Recommended by diploma supervisor.					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 79					
A	B	C	D	E	FX
89,87	5,06	5,06	0,0	0,0	0,0
Lecturers: prof. RNDr. Jozef Masarik, DrSc.					
Last change: 02.06.2015					
Approved by:					

STATE EXAM DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJFB/2-FJF-991/16	Course title: Diploma Thesis Defense
Number of credits: 16	
Educational level: II.	
State exam syllabus:	
Last change:	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJFB/2-FJF-920/00		Course title: Diploma Thesis Seminar (1)			
Educational activities: Type of activities: seminar Number of hours: per week: 1 per level/semester: 13 Form of the course: on-site learning					
Number of credits: 1					
Recommended semester: 2.					
Educational level: II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus: The first public presentation of the diploma thesis, formulation of the aims of the diploma thesis and the chosen way of realisation. Concluding analysis of the seminar talk. Methodical advancement at the preparation of the structure and duration of the given seminar thesis, the use of references and possible ways to obtain needed informations.					
Recommended literature: According to the given diploma thesis.					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 84					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
Lecturers: prof. RNDr. Jozef Masarik, DrSc.					
Last change: 02.06.2015					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJFB/2-FJF-921/00		Course title: Diploma Thesis Seminar (2)			
Educational activities: Type of activities: seminar Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 3.					
Educational level: II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus: Common principles how to write a scientific particle, particularly a diploma thesis. Graifcal arrangement, segmentation, correct use of references etc. Seminar talk in a given time-frame, the use of different techniques at presentation. Concluding evaluation of the presented talk.					
Recommended literature: According to the given diploma thesis.					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 81					
A	B	C	D	E	FX
98,77	0,0	0,0	0,0	1,23	0,0
Lecturers: prof. RNDr. Jozef Masarik, DrSc.					
Last change: 02.06.2015					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJFB/2-FJF-922/00		Course title: Diploma Thesis Seminar (3)			
Educational activities: Type of activities: seminar Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 4.					
Educational level: II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus: To prepare the diploma thesis in the form, which is commonly used for this type of scientific publications. Analyses of the diploma thesis presentation, recommendations for eventual corrections, modifications and structure of the text, figure and table insertion and conformity with the text etc. Common principles and recommendations to present the diploma thesis at the session of the examination committee in 15 – 20 min time limit.					
Recommended literature: The given diploma thesis.					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 80					
A	B	C	D	E	FX
98,75	0,0	0,0	0,0	1,25	0,0
Lecturers: prof. RNDr. Jozef Masarik, DrSc.					
Last change: 02.06.2015					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJFB/2-FJF-103/15		Course title: Elementary Particle Physics			
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 2 / 1 per level/semester: 26 / 13 Form of the course: on-site learning					
Number of credits: 4					
Recommended semester: 2.					
Educational level: II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 37					
A	B	C	D	E	FX
67,57	18,92	8,11	5,41	0,0	0,0
Lecturers: prof. RNDr. Jozef Masarik, DrSc., Mgr. Pavol Bartoš, PhD.					
Last change: 02.06.2015					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KAI/2-MXX-130/21		Course title: Elements of AI			
Educational activities: Type of activities: independent work Number of hours: per week: 25 per level/semester: 325 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 1.					
Educational level: II.					
Prerequisites:					
Course requirements: Passing the online course https://course.elementsofai.com/ (in English or Slovak version).					
Learning outcomes: The student will get acquainted with selected basic concepts of artificial intelligence and their use in solving various practical tasks.					
Class syllabus: 1. What is artificial intelligence: related areas, AI philosophy. 2. Troubleshooting and UI: Browsing and troubleshooting, browsing and games 3. Probability and chance, Bayes' theorem, naive Bayesian classification. 4. Machine learning: nearest neighbor classifier, regression. 5. Neural networks: basics, creation, modern techniques. 6. Consequences: on predicting the future, the effects of AI on society, summary.					
Recommended literature: Russell S., Norwig P. (2010). Artificial Intelligence: A Modern Approach, (3rd ed.), Prentice Hall. Available in faculty library. Marsland S. (2015). Machine Learning: An Algorithmic Perspective, (2nd ed.), CRC Press.					
Languages necessary to complete the course: Slovak or English					
Notes: The course consists of 20 numerical and 5 text-based tasks. Numerical tasks are checked automatically, text-based tasks are evaluated anonymously by students.					
Past grade distribution Total number of evaluated students: 37					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
Lecturers: doc. RNDr. Mária Markošová, PhD.					

Last change: 22.08.2021
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KAI/2-MXX-130/21		Course title: Elements of AI			
Educational activities: Type of activities: independent work Number of hours: per week: 25 per level/semester: 325 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 2.					
Educational level: II.					
Prerequisites:					
Course requirements: Passing the online course https://course.elementsofai.com/ (in English or Slovak version).					
Learning outcomes: The student will get acquainted with selected basic concepts of artificial intelligence and their use in solving various practical tasks.					
Class syllabus: 1. What is artificial intelligence: related areas, AI philosophy. 2. Troubleshooting and UI: Browsing and troubleshooting, browsing and games 3. Probability and chance, Bayes' theorem, naive Bayesian classification. 4. Machine learning: nearest neighbor classifier, regression. 5. Neural networks: basics, creation, modern techniques. 6. Consequences: on predicting the future, the effects of AI on society, summary.					
Recommended literature: Russell S., Norwig P. (2010). Artificial Intelligence: A Modern Approach, (3rd ed.), Prentice Hall. Available in faculty library. Marsland S. (2015). Machine Learning: An Algorithmic Perspective, (2nd ed.), CRC Press.					
Languages necessary to complete the course: Slovak or English					
Notes: The course consists of 20 numerical and 5 text-based tasks. Numerical tasks are checked automatically, text-based tasks are evaluated anonymously by students.					
Past grade distribution Total number of evaluated students: 37					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
Lecturers: doc. RNDr. Mária Markošová, PhD.					

Last change: 22.08.2021
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJP/1-MXX-233/13		Course title: English Conversation Course (1)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 1., 3.					
Educational level: I., II.					
Prerequisites:					
Course requirements: tests, presentations, essays Course prerequisites: https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/poziadavky-na-udelenie-priebezhneho-hodnotenia-aj1aj2aj3-ostatne-kurzy/ Scale of assessment (preliminary/final): 100/0					
Learning outcomes: Continual improvement of all language skills focused on communication/speaking, listening comprehension and writing. The emphasis is on discourse, lexicology and morphology, word-bank broadening of communicational English as well as English for specific purposes appropriate for university students. This course is a follow up of the previously taught ESP course.					
Class syllabus: This course's focus is to broaden spoken/communicational English for students with B2/C1 level of English knowledge.					
Recommended literature: Appropriate study material is supplied based on the participants' level of English by the lecturer. (Sources- The Guardian, The Herald Morning Sun. The Nine News, The West Australian, BBC News and podcasts, CNN podcasts).					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 215					
A	B	C	D	E	FX
67,44	13,02	6,51	1,86	1,4	9,77
Lecturers: Mgr. Aneta Barnes					

Last change: 21.06.2022
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJP/1-MXX-234/13		Course title: English Conversation Course (2)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 2., 4.					
Educational level: I., II.					
Prerequisites:					
Course requirements: tests, oral presentations, essays Course prerequisites: https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/poziadavky-na-udelenie-priebezhneho-hodnotenia-aj1aj2aj3-ostatne-kurzy/ Scale of assessment (preliminary/final): 100/0					
Learning outcomes: Continual improvement of all language skills focused on communication/speaking, listening comprehension and writing. The emphasis is on discourse, lexicology and morphology, word-bank broadening of communicational/spoken English as well as English for specific purpose appropriate for university students. This course is a follow up of the Conversational English course 1.					
Class syllabus: This course's focus is to broaden spoken/communicational English for students with B2/C1 level of English knowledge(Upper-Intermediate/Lower Advanced).					
Recommended literature: Appropriate study material is supplied based on the participants'level of English by the lecturer. (Sources- The Guardian, The Herald Morning Sun. The Nine News, The West Australian, BBC News and podcasts, CNN podcasts).					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 146					
A	B	C	D	E	FX
77,4	12,33	3,42	1,37	0,0	5,48
Lecturers: Mgr. Aneta Barnes					

Last change: 21.06.2022
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJFB/2-FJF-114/15	Course title: Experimental Methods in Nuclear Physics (1)
Educational activities: Type of activities: lecture Number of hours: per week: 4 per level/semester: 52 Form of the course: on-site learning	
Number of credits: 6	
Recommended semester: 1.	
Educational level: II.	
Prerequisites:	
Course requirements: Exam: written and oral exam, successful completion of the written part is condition for the oral part. Share in the overall rating: 80/20. Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 0/100	
Learning outcomes: To provide students with basic information about the interaction of charged particles and photons with different energies with the material environment. Explain the physical principles of operation of detectors designed for registration and identification of nuclear radiation, elementary particles and heavy ions	
Class syllabus: Interaction of charged particles, neutrons and gamma radiation with the material environment. Elastic scattering. Rutherford and Mott formulas. Electron scattering, Radiation braking. Ionization and arousal. Bethe-Bloch formula. Ionization energy losses. Particle range. Delta electrons. Fluctuations in ionization losses. Cherenkov radiation. Transient radiation. Interaction of photons with matter. High energy interactions. Principles of operation of gas detectors. Ionization chambers, proportional, G-M, corona and spark detectors. Scintillation and semiconductor detectors.	
Recommended literature: G.F. Knoll: Radiation Detection and Measurement, John Wiley & Sons, 2000 W. R. Leo, Techniques for nuclear and particle physics, Springer Verlag, Berlin, 1996 K. Kleinknecht, Detectors for particle radiation, Cambridge University Press, 1998 S. Usačev a kol., Experimentálna jadrová fyzika, ALFA-SNTL, Bratislava 1982 Š. Šáro, Detekcia a spektrometria žiarenia alfa a beta. Alfa, Bratislava, 1983 V. V. Balashov, Interaction of Particles and Radiation with Matter, Springer Verlag Berlin Heidelberg, 1997, 238p, ISBN3-540-60871-0 N. J. Carron, An Introduction to the Passage of Energetic Particles through Matter, CRC Press, Taylor&Francis Group, 2007, ISBN-10:0-7503-0935-0	
Languages necessary to complete the course:	

slovak, english					
Notes:					
Past grade distribution					
Total number of evaluated students: 38					
A	B	C	D	E	FX
21,05	21,05	31,58	13,16	13,16	0,0
Lecturers: doc. RNDr. Ivan Sýkora, PhD.					
Last change: 21.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJFB/2-FJF-105/00	Course title: Experimental Methods in Nuclear Physics (2)
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning	
Number of credits: 3	
Recommended semester: 2.	
Educational level: II.	
Prerequisites:	
Course requirements: Examination: written and oral examination Successful written part is a condition for the oral part of the exam Share in overall evaluation: (written / oral) 70/30 Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 0/100	
Learning outcomes: After completing the course, students will have knowledge of nuclear spectrometry methods and their application in the use of radionuclides.	
Class syllabus: Specifics of the nuclear physics measurements, the base structure of the measuring equipment, the detector response function, energy resolution (limits, Fano factor), time characteristics (pile-up, the spectrum distortion). Magnetic methods of spectrometry, using magnetic field to separation of particle beam, the magnetic field focustion, the classification of the spectrometers. Ionization methods of charge particles spectrometry, ionization chamber with grid, principles of using the proportional counters, semiconductors detectors in the spectrometry, detectors with compensation and HPGe detectors. Scintillation spectrometry methods, treating of instrumental spectra, peak efficiency, multiple detectors gamma-ray spectrometry. The high resolution spectrometer electronic circuits scheme. The liquid scintillation spectrometry applications (3H a 14C analysis). Applications scintillations methods in radionuclide diagnostics (gammagraphic methods and PET, principles of imaging using the thin scintillator)	
Recommended literature: Usačev S., a kol.: Experimentálna jadrová fyzika, ALFA Bratislava, 1982 Abramov A. I.: Osnovy experimentalnych metodov jadernoj fyziky, Atmizdat Moskva 1980 W.R. Leo, Techniques for nuclear and particle physics, Springer Verlag, Berlin, 1996 K. Debertin and R.G. Helmer: Gamma-and X-ray spectrometry with semiconductor detctors, North-Holland, Amsterdam, 1988	
Languages necessary to complete the course:	

slovak, english					
Notes:					
Past grade distribution					
Total number of evaluated students: 84					
A	B	C	D	E	FX
30,95	20,24	23,81	17,86	4,76	2,38
Lecturers: RNDr. Miroslav Pikna, PhD.					
Last change: 17.06.2022					
Approved by:					

STATE EXAM DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJFB/2-FJF-956/15	Course title: Experimental Methods in Nuclear and Subnuclear Physics
Number of credits: 2	
Educational level: II.	
State exam syllabus:	
Last change: 02.06.2015	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJFB/2-FJF-136/00		Course title: Feynman Diagrams			
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 3					
Recommended semester: 2.					
Educational level: II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus: Particle scattering on potential in quantum mechanics, relativistic equations and their propagators, scattering of electron and positon on potential field, intercatons of electrons, muons and photons, second approach to Feynman diagram – quntum field theory.					
Recommended literature: J. Pišút, Introduction to Feynam diagrams, Study texts UK Bratislava, (1984) (in Slovak) J.D. Bjorken, S.D. Drell, Relativistic quantum mechanics, McGraw-Hill, New York, (1976)					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 32					
A	B	C	D	E	FX
87,5	12,5	0,0	0,0	0,0	0,0
Lecturers: prof. RNDr. Jozef Masarik, DrSc., prof. Ing. Ivan Hubač, DrSc.					
Last change: 02.06.2015					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJP/1-MXX-141/00		Course title: French Language (1)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 1.					
Educational level: I., II.					
Prerequisites:					
Course requirements: Scale of assessment (preliminary/final): 100/0					
Learning outcomes:					
Class syllabus: French language is taught at two levels: beginner and intermediate. Students opt for one of them depending on whether they wish to obtain the fundamentals of the language or wish to maintain and/or improve previous knowledge of French.					
Recommended literature: Capelle Guy, Menand Robert: Le Nouveau taxi 1, Hachette FLE Paris, France 2009, ISBN 978-2-01-155548 - 9					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 435					
A	B	C	D	E	FX
45,75	20,0	18,85	8,74	2,3	4,37
Lecturers: Mgr. Ľubomíra Kožehubová					
Last change: 20.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFL.KJP/1-MXX-142/00		Course title: French Language (2)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 2.					
Educational level: I., II.					
Prerequisites:					
Course requirements: Scale of assessment (preliminary/final): 100/0					
Learning outcomes:					
Class syllabus: The subject continues the program of French language (1) and provides courses of essential and intermediate French language.					
Recommended literature: Capelle Guy, Menand Robert: Le Nouveau taxi 1, Hachette FLE Paris, France 2009, ISBN 978-2-01-155548 - 9					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 265					
A	B	C	D	E	FX
38,87	25,28	19,62	10,19	2,64	3,4
Lecturers: Mgr. Ľubomíra Kožehubová					
Last change: 20.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJP/1-MXX-241/00		Course title: French Language (3)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 3.					
Educational level: I., II.					
Prerequisites:					
Course requirements: Scale of assessment (preliminary/final): 100/0					
Learning outcomes:					
Class syllabus: The subject provides a course of intermediate French language, covering not only general, but also technical language.					
Recommended literature: Capelle Guy, Menand Robert: Le Nouveau taxi 1, Hachette FLE Paris, France 2009, ISBN 978-2-01-155548 - 9					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 104					
A	B	C	D	E	FX
39,42	27,88	21,15	6,73	0,96	3,85
Lecturers: Mgr. Ľubomíra Kožehubová					
Last change: 20.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJP/1-MXX-242/00		Course title: French Language (4)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 4.					
Educational level: I., II.					
Prerequisites:					
Course requirements: Scale of assessment (preliminary/final): 100/0					
Learning outcomes:					
Class syllabus: The subject provides a course of intermediate French covering not only general, but also technical French language.					
Recommended literature: Menand Robert: Le Nouveau taxi 2, Hachette FLE, Paris, France 2009, ISBN 978-2-01-155551 - 9					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 74					
A	B	C	D	E	FX
41,89	32,43	17,57	2,7	1,35	4,05
Lecturers: Mgr. Ľubomíra Kožehubová					
Last change: 20.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJP/1-MXX-151/00		Course title: German Language (1)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 1.					
Educational level: I., II.					
Prerequisites:					
Course requirements: Scale of assessment (preliminary/final): 100/0					
Learning outcomes: To master the fundamentals of the common language and basic technical terms of particular fields of study (depending on the student's level of German proficiency)					
Class syllabus: German language is taught at three levels: beginner, intermediate and advanced. Students opt for one of them depending on whether they need to learn the fundamentals or maintain and/or improve their previous knowledge. This course's focus is to master the fundamentals of the common language and basic technical terms of particular fields of study (depending on the student's level of German proficiency)					
Recommended literature: Appropriate study material is supplied by teacher based on the participants'level of German proficiency.					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 734					
A	B	C	D	E	FX
36,1	27,25	19,62	8,99	2,72	5,31
Lecturers: Mgr. Alexandra Maďarová, Mgr. Simona Tomášková, PhD.					
Last change: 21.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJP/1-MXX-152/00		Course title: German Language (2)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 2.					
Educational level: I., II.					
Prerequisites:					
Course requirements: Scale of assessment (preliminary/final): 100/0					
Learning outcomes: To master the fundamentals of the common language and basic technical terms of particular fields of study (depending on the student's level of German proficiency)					
Class syllabus: German language is taught at two levels: beginner and intermediate. Students opt for one of them depending on whether they wish to obtain the fundamentals of the language or wish to maintain and/or improve previous knowledge of German. This course's focus is to to master the fundamentals of the common language and basic technical terms of particular fields of study (depending on the student's level of German proficiency)					
Recommended literature: Appropriate study material is supplied by teacher based on the participants'level of German proficiency					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 480					
A	B	C	D	E	FX
36,04	20,21	20,83	13,13	3,33	6,46
Lecturers: Mgr. Alexandra Maďarová, Mgr. Simona Tomášková, PhD.					
Last change: 21.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJP/1-MXX-251/00		Course title: German Language (3)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 3.					
Educational level: I., II.					
Prerequisites:					
Course requirements: Scale of assessment (preliminary/final): 100/0					
Learning outcomes: Master the basics of general language and basic professional terminology of individual fields of study (depending on the advanced level of students)					
Class syllabus: The course is a follow-up to the German language (1,2). The subject provides a course of intermediate or advanced German language. This course's focus is to deepen the knowledge of the common language and basic technical terms of particular fields of study (depending on the student's level of German proficiency).					
Recommended literature: Appropriate study material is supplied by teacher based on the participants' level of German proficiency.					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 165					
A	B	C	D	E	FX
41,21	25,45	20,61	6,67	2,42	3,64
Lecturers: Mgr. Alexandra Maďarová, Mgr. Simona Tomášková, PhD.					
Last change: 21.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJP/1-MXX-252/00		Course title: German Language (4)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 4.					
Educational level: I., II.					
Prerequisites:					
Course requirements: Scale of assessment (preliminary/final): 100/0					
Learning outcomes: Master the basics of general language and basic professional terminology of individual fields of study (depending on the advanced level of students)					
Class syllabus: The course is a follow-up to the German language (1-3). It provides a course of intermediate and advanced German language. This course's focus is to deepen the knowledge of the common language and basic technical terms of particular fields of study (depending on the student's level of German proficiency).					
Recommended literature: Appropriate study material is supplied by teacher based on the participants' level of German proficiency.					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 90					
A	B	C	D	E	FX
42,22	24,44	12,22	12,22	3,33	5,56
Lecturers: Mgr. Alexandra Maďarová, Mgr. Simona Tomášková, PhD.					
Last change: 21.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJFB/2-FJF-222/15		Course title: High Energy Physics			
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 2 / 1 per level/semester: 26 / 13 Form of the course: on-site learning					
Number of credits: 4					
Recommended semester: 3.					
Educational level: II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 35					
A	B	C	D	E	FX
25,71	22,86	28,57	11,43	8,57	2,86
Lecturers: prof. RNDr. Stanislav Tokár, DrSc., Mgr. Pavol Bartoš, PhD.					
Last change: 02.06.2015					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJFB/2-FJF-142/15	Course title: Methods in Nuclear Structure Studies
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning	
Number of credits: 3	
Recommended semester: 2.	
Educational level: II.	
Prerequisites:	
Course requirements: Evaluation during the semester: midterm test Final evaluation: oral exam Scale for final grades: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 40/60	
Learning outcomes: The student gains an understanding of the structure of atomic nuclei and possibilities for its study. Acquired knowledge allows the student to estimate and evaluate the nuclear structure properties from the experimental data obtained in the decay-spectroscopy measurements.	
Class syllabus: Spherical and deformed shell model. Influence of the nuclear structure on the radioactive decay. Excited states and the deexcitation of atomic nuclei, acquiring the nuclear data from the conversion-electron and gamma spectroscopy. Isomeric states in spherical and deformed nuclei. Multi-quasiparticle K isomeric states. Collective excitations. In-beam spectroscopy. Detection of nuclear fission fragments. Decay spectroscopy and separation of reaction products. Radioactive-ion beam. Laser spectroscopy. Data analysis, statistical analysis and evaluation of basic properties for atomic nuclei from experimental data.	
Recommended literature: Introductory nuclear physics / Kenneth S. Krane. Hoboken : Wiley, 1988 Introductory nuclear physics / P. E. Hodgson, E. Gadioli, E. Gadioli Erba. Oxford : Oxford University Press, 1997 Nuclear structure from a simple perspective / R. F. Casten. Oxford : Oxford University Press, 2000	
Languages necessary to complete the course:	
Notes:	

Past grade distribution					
Total number of evaluated students: 27					
A	B	C	D	E	FX
70,37	7,41	7,41	3,7	11,11	0,0
Lecturers: doc. Mgr. Stanislav Antalic, PhD.					
Last change: 21.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJFB/2-FJF-125/00	Course title: Modelling Experimental Set-Ups
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning	
Number of credits: 3	
Recommended semester: 2.	
Educational level: II.	
Prerequisites:	
Course requirements: Interim evaluation: homeworks Exam: oral Indicative evaluation scale: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 50/50	
Learning outcomes: Students will understand how to model random variables in general, and how to apply the general principles to the task of simulating interaction of particles with material. They will gain basic understanding of probability theory, estimators and hypothesis testing. They will learn how to use machine learning models to solve classification problems in physics and how to use unfolding to estimate true distributions from observations smeared by experimental measurement.	
Class syllabus: <ol style="list-style-type: none"> 1. Introduction to C++ and ROOT software. 2. Introduction to probability theory and statistics. Uncertainty propagation, Central Limit Theorem. 3. Random distributions occurring in physics, computer-based random number generation. 4. Estimators, statistical tests, estimation of confidence intervals. 5. Stochastic processes and Markov chains. 6. Modelling of particle interaction with material and the transport equation. 7. Introduction to Bayesian statistics and Fisher discriminant. 8. p-value and statistical significance of a measurement. 9. Machine learning and its application for signal/background classification in physics. 10. Deconvolution (unfolding). Issues with a naive approach to unfolding. Parametrized unfolding approach. 11. Hypothesis testing. Quantification of agreement of data and a model. Chi-square and likelihood approaches. 12. Maximum likelihood fit and uncertainties estimation. 	
Recommended literature:	

Data Analysis in High Energy Physics: A Practical Guide to Statistical Methods, Olaf Behnke, Kevin Kröninger, Grégory Schott, and Thomas Schörner-Sadenius, 2013
 Statistics, a guide to the use of statistical methods in the physical sciences, R. J. Barlow, John Wiley and Sons, 1989
 Introduction to Statistics and Data Analysis for Physicists, Gerhard Bohm, Günter Zech, 2010

Languages necessary to complete the course:

Slovak, English

Notes:

Past grade distribution

Total number of evaluated students: 32

A	B	C	D	E	FX
84,38	6,25	6,25	0,0	0,0	3,13

Lecturers: prof. RNDr. Stanislav Tokár, DrSc., Mgr. Oliver Majerský, PhD., Mgr. Michal Dubovský, PhD.

Last change: 22.06.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJFB/2-FJF-249/16		Course title: Modelling of Radiation Interaction with Matter			
Educational activities: Type of activities: course Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 3					
Recommended semester: 4.					
Educational level: II.					
Prerequisites:					
Course requirements: Semestral project, oral examination Approximate grade thresholds: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 50/50					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 1					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
Lecturers: prof. RNDr. Stanislav Tokár, DrSc., RNDr. Tibor Ženiš, PhD., Mgr. Róbert Breier, PhD.					
Last change: 20.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJFB/2-FJF-244/16		Course title: Neutrino Physics and Weak Interactions in Nuclei			
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 3					
Recommended semester: 4.					
Educational level: II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 1					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
Lecturers: prof. RNDr. Fedor Šimkovic, CSc., Mgr. Dušan Štefánik, PhD.					
Last change: 20.05.2016					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJFB/2-FJF-221/15		Course title: Neutron Physics and Reactor Systems			
Educational activities: Type of activities: lecture Number of hours: per week: 3 per level/semester: 39 Form of the course: on-site learning					
Number of credits: 4					
Recommended semester: 3.					
Educational level: II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 26					
A	B	C	D	E	FX
73,08	11,54	11,54	0,0	0,0	3,85
Lecturers: doc. RNDr. Karol Holý, CSc., RNDr. Miroslav Ješkovský, PhD.					
Last change: 17.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJFB/2-FJF-122/00		Course title: Nuclear Electronics			
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 3					
Recommended semester: 1.					
Educational level: II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus: The lecture deals: with basic information about methods using in linear circuits analyses, about circuits with semiconductors elements (- transistors, operational amplifiers, fast pulse amplifiers, linear amplifier with low noise level), about others circuits useful in pulse high digitization techniques and in coincidence timing measurement (- Pulse shapers and amplitude discriminators, Methods to generate fast-time pick-off signal from input pulse, coincidence and anticoincidence circuits and automation of data processing).					
Recommended literature: D.Kollár: Elektronika a automatizácia I. Textbook MFF UK 1990. D.Kollár: Elektronika a automatizácia II. Textbook MFF UK 1990. A. P. Citovič: Jadernaja elektronika, Energoatomizdat, Moskva 1984. U. Tietze, Ch. Schenk: Halbleiter-schaltungstechnik, MIR, Moskva 1982. J. Šeda, J. Sabol, J. Kubánek: Jaderná elektronika, SNTL, Praha 1977. Comments to the lectures on web URL -- http://www.dnp.fmph.uniba.sk/~kollar/navodnik.htm .					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 84					
A	B	C	D	E	FX
38,1	30,95	19,05	5,95	2,38	3,57
Lecturers: RNDr. Tibor Ženiš, PhD.					
Last change: 02.06.2015					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJFB/2-FJF-133/15	Course title: Nuclear Energetics
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning	
Number of credits: 3	
Recommended semester: 4.	
Educational level: II.	
Prerequisites:	
Course requirements: Final assessment: oral examination. Grading: (%): A (100-91), B (90-81), C (80-71), D (70-61), E (60-51), FX (50-0) Scale of assessment (preliminary/final): 0/100	
Learning outcomes: By completing the subject, students will gain knowledge about the principles of nuclear energy and other energy sources, their impact on the environment and the current energy situation in Slovakia and in the world.	
Class syllabus: <ol style="list-style-type: none"> 1. Energetics and environment 2. Renewable and non-renewable energy sources 3. Price and production of electricity 4. Anthropogenic radionuclides and their sources 5. Sources of radiation in nuclear power plant 6. Radiation protection in NPP 7. Physical basics of a nuclear reactor and types of reactors 8. Fuel cycle 9. Radioactive wastes and their treatment 10. Safety of nuclear power plant operation 11. Nuclear power plant accidents and their environmental impact 12. Monitoring of anthropogenic radioactivity 13. Nuclear energetics in Slovakia and in the world 	
Recommended literature: [1] O. Holá a K. Holý, Radiačná ochrana – ionizujúce žiarenie, jeho účinky a ochrana pred ionizujúcim žiarením, STU Bratislava, (2010), S. 200. [2] D. Bodansky, Nuclear energy - principles, practices, and prospects, Springer, (2004), S. 701. [3] R. L. Murray, Nuclear Energy - An Introduction to the Concepts, Systems, and Applications of Nuclear Processes, Butterworth-Heinemann (Elsevier), (2009), S. 519.	

Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 9					
A	B	C	D	E	FX
77,78	11,11	11,11	0,0	0,0	0,0
Lecturers: Ing. Jakub Kaizer, PhD.					
Last change: 21.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJFB/2-FJF-138/00	Course title: Nuclear Geophysics and Astrophysics
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning	
Number of credits: 3	
Recommended semester: 2.	
Educational level: II.	
Prerequisites:	
Course requirements: Interim evaluation: test Final assessment: oral examination Indicative rating scale: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 30/70	
Learning outcomes: To point to the application of nuclear-physical knowledge in the field of astrophysics and cosmology, as well as to the interconnectedness of these disciplines and to teach basic knowledge about the production of applications of cosmogenic and primordial nuclides.	
Class syllabus: <ol style="list-style-type: none"> 1. Big Bang and Nucleosynthesis 2. r and p processes, 3. The formation of the megastructure of the universe, 4. formation of the solar system, 5. Meteorites - their origin, properties, 6. The inner and outer planets of the solar system, 7. Cosmic radiation, 8. Nuclear reactions of cosmic radiation 9. Production of cosmogenic nuclides in extraterrestrial objects, 10. the production of cosmogenic nuclides in the Earth's atmosphere, 11. in situ production of cosmogenic nuclides. 12. Isotopic dating methods 	
Recommended literature: Cosmic rays and particle physics by Thomas K. Gaisser. Cambridge : Cambridge University Press, 1992 Theoretical astrophysics : Volume 1 : Astrophysical processes / T. Padmanabhan. Cambridge : Cambridge University Press, 2000	
Languages necessary to complete the course:	

Notes:					
Past grade distribution					
Total number of evaluated students: 39					
A	B	C	D	E	FX
66,67	23,08	5,13	5,13	0,0	0,0
Lecturers: prof. RNDr. Jozef Masarik, DrSc.					
Last change: 20.06.2022					
Approved by:					

STATE EXAM DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJFB/2-FJF-958/15	Course title: Nuclear Physics
Number of credits: 2	
Educational level: II.	
State exam syllabus:	
Last change: 02.06.2015	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJFB/2-FJF-202/00	Course title: Nuclear Reactions
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning	
Number of credits: 3	
Recommended semester: 2.	
Educational level: II.	
Prerequisites:	
Course requirements: Evaluation during the semester: midterm test Final evaluation: oral exam Scale for final grades: A 90%, B 80%, C 70%, D 60%, E 50%	
Learning outcomes: The student gains an understanding of nuclear reactions and their properties. Acquired knowledge allows the student to estimate and evaluate the production yield of nuclear reaction and their kinematic properties. The student will be also able to estimate and suggest a suitable experimental base to solve various questions in the field of nuclear physics.	
Class syllabus: General principles of nuclear reactions (NRs), reaction kinematics, the role of orbital momentum, rotational potential, types of NRs, reaction cross-section, elastic and inelastic scattering, neutron-induced NRs, nucleon transfer reactions, deep inelastic reactions, optical model, reactions of gamma quanta, compound nucleus reactions, heavy-ion reactions, fission reactions, applications of NRs, thermonuclear reactions, synthesis of superheavy nuclei, nuclear reactions at relativistic energies.	
Recommended literature: Introduction to nuclear reactions / Carlos A. Bertulani, Pawel Danielewicz. Bristol : Institute of Physics Publishing, 2004 Introductory nuclear physics / Kenneth S. Krane. Hoboken : Wiley, 1988 Introductory nuclear physics / P. E. Hodgson, E. Gadioli, E. Gadioli Erba. Oxford : Oxford University Press, 1997	
Languages necessary to complete the course:	
Notes:	

Past grade distribution					
Total number of evaluated students: 86					
A	B	C	D	E	FX
53,49	20,93	16,28	5,81	3,49	0,0
Lecturers: doc. Mgr. Stanislav Antalic, PhD.					
Last change: 21.06.2022					
Approved by:					

STATE EXAM DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJFB/2-FJF-955/15	Course title: Nuclear and Subnuclear Physics
Number of credits: 2	
Educational level: II.	
State exam syllabus:	
Last change: 02.06.2015	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJFB/2-FJF-107/00		Course title: Nucleus Theory			
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 3					
Recommended semester: 2.					
Educational level: II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus: History and success of nuclear physics, basic characteristics of nucleus (mass, dimension, spin, magnetic and electric moments, quadrupole moments, nuclear deformation), models of strong interacting particles (drop model, nuclear matter, nuclear stars), models of independent particles (Fermi model), nuclear shell model (harmonic oscillator potential, Woods-Saxon potential, spin-orbit interaction), generalized models (single particle states in non-sphericals – Nilsson model, roational bands, vibrational states, resonances), optical model, Pauli exclusion principle and isospin, Nucleon-nucleon interaction, phase analysis of scattering angles, two-particle wave function, deuteron, nuclear Hamiltonian, microscopical models (Hartree and Hartree-Fock methods), nuclear interactions (alpha, beta and gamma nuclear transitions).					
Recommended literature: T. Mayer-Kuckuk: Fyzika atómového jadra, SNTL, Praha, 1979, J.M.Eisenberg, W.Greiner: Nuclear Theory					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 84					
A	B	C	D	E	FX
52,38	33,33	10,71	1,19	2,38	0,0
Lecturers: prof. RNDr. Fedor Šimkovic, CSc., Mgr. Dušan Štefánik, PhD.					
Last change: 02.06.2015					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJFB/2-FJF-124/00		Course title: Numerical Methods in Nuclear Physics			
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 3					
Recommended semester: 2.					
Educational level: II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus: Approximation by rational functions, approximation by trigonometric functions, solution of linear algebraic equations, solution of nonlinear equations, interpolation and extrapolation, numerical integration, special functions (gamma, beta factorials), random numbers, minimization and maximization of functions. Error propagation. Fourier transformation. Ordinary and partial differential equations.					
Recommended literature: P.L. DeVries, A first course in computational physics, John Wiley, Miami (1984) S.S.M. Wong, Computational methods in physics and engineering, Prentice Hall, Englewood Cliffs, (1992) K. Langanke, J.A. Maruhn, S.E. Koonin, Computational nuclear physics 1,2, Springer/Verlag, New York, (1993)					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 49					
A	B	C	D	E	FX
95,92	4,08	0,0	0,0	0,0	0,0
Lecturers: RNDr. Ing. Milan Melicherčík, PhD.					
Last change: 02.06.2015					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJFB/2-FJF-132/00	Course title: Particle Accelerators
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning	
Number of credits: 3	
Recommended semester: 1.	
Educational level: II.	
Prerequisites:	
Course requirements: Examination: written test / oral examination, 70/30 Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%	
Learning outcomes: The course will cover the physics of particle accelerators. It will introduce the techniques used in particle accelerators, and describe the layout and functionality of modern accelerators and acceleration systems.	
Class syllabus: <ol style="list-style-type: none"> 1. Linear accelerators – electrostatic, Linear resonant accelerators 2. Linear accelerators of relativistic particles, Resonators 3. Accelerators with running and standing wave, Principe of self-phasing 4. Cyclic accelerators – Cyclotron, Phazotron 5. Relativistic isochronic cyclotron, Microtron, Betatron 6. Stationary trajectory of accelerator 7. Synchrotron, Synchrophazotron 8. Weak and Strong focusation 9. Equation of motion for particle in acceleration 10. Compactness of beam momentum, Criterion of stability 11. Fix target accelerators 12. Quality and cooling of beam 	
Recommended literature: E. Wilson, An Introduction to Particle Accelerators, Oxford Univ. Press, 2001, s. 252 K. Wille, The Physics of Particle Accelerators : An Introduction, Oxford University Press, 2001, s. 330 S. Bernal, A Practical Introduction to Beam Physics and Particle Accelerators, Morgan & Claypool Publishers, 2016,	
Languages necessary to complete the course: slovak, english	

Notes:					
Past grade distribution Total number of evaluated students: 83					
A	B	C	D	E	FX
54,22	30,12	14,46	0,0	0,0	1,2
Lecturers: Mgr. Michal Mereš, PhD.					
Last change: 20.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFL.KTV/2-MXX-110/00		Course title: Physical Education and Sport (1)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 1.					
Educational level: II.					
Prerequisites:					
Course requirements: Scale of assessment (preliminary/final): 100/0					
Learning outcomes:					
Class syllabus: Practicing of the students' game skills in collective sports: basketball, volleyball, football, floorball and hockey. Mastering of the basic technique of a particular sport discipline in other sports. In paddling, basic training on still and slightly flowing water. Development of coordination skills, improvement of articular mobility and cardiovascular system.					
Recommended literature:					
Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 1657					
A	B	C	D	E	FX
98,37	0,6	0,06	0,0	0,0	0,97
Lecturers: PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, Mgr. Jana Leginusová, Mgr. Tomáš Kuchár, PhD., PaedDr. Mikuláš Ortutay, Mgr. Martin Dovičák, PhD., Mgr. Júlia Raábová, PhD., Mgr. Branislav Nedbálek, Mgr. Tomáš Lovecký					
Last change: 15.03.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KTV/2-MXX-120/00		Course title: Physical Education and Sport (2)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 2.					
Educational level: II.					
Prerequisites:					
Course requirements: Scale of assessment (preliminary/final): 100/0					
Learning outcomes:					
Class syllabus: Practicing of offensive and defensive game combinations and playing with modified rules in collective sports such as basketball, volleyball, football, floorball, hockey. Command of elements of higher difficulty in locomotion skills (swimming - crawl stroke, breast stroke, butterfly stroke, trampoline jumping and aerobics – practicing of aerobics compositions, bodybuilding – development of the main muscle groups, paddling on running water. Testing of the level of physical fitness and coordination skills.					
Recommended literature:					
Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 1557					
A	B	C	D	E	FX
98,52	0,39	0,06	0,06	0,06	0,9
Lecturers: Mgr. Martin Dovičák, PhD., Mgr. Tomáš Kuchár, PhD., Mgr. Jana Leginusová, PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, Mgr. Branislav Nedbálek, PaedDr. Mikuláš Ortutay, Mgr. Júlia Raábová, PhD., Mgr. Tomáš Lovecký					
Last change: 15.03.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFL.KTV/2-MXX-210/00		Course title: Physical Education and Sport (3)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 3.					
Educational level: II.					
Prerequisites:					
Course requirements: Scale of assessment (preliminary/final): 100/0					
Learning outcomes:					
Class syllabus: To improve offensive and defensive game combinations in collective sports. Practicing of tactical and technical elements in individual sports. Compensatory exercises to correct wrong body posture. Stretching. Competition rules in sport disciplines.					
Recommended literature:					
Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 1281					
A	B	C	D	E	FX
98,75	0,47	0,08	0,0	0,0	0,7
Lecturers: PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, Mgr. Jana Leginusová, Mgr. Tomáš Kuchár, PhD., PaedDr. Mikuláš Ortutay, Mgr. Martin Dovičák, PhD., Mgr. Júlia Raábová, PhD., Mgr. Branislav Nedbálek, Mgr. Tomáš Lovecký					
Last change: 15.03.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KTV/2-MXX-220/00		Course title: Physical Education and Sport (4)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 4.					
Educational level: II.					
Prerequisites:					
Course requirements: Scale of assessment (preliminary/final): 100/0					
Learning outcomes:					
Class syllabus: Sport training for Faculty Championships in a selected sport with modified rules. Selection of sport-talented students into teams of the Faculty Sport League, University League of Bratislava Faculties, and participation in sport events of the Faculty and University.					
Recommended literature:					
Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 1110					
A	B	C	D	E	FX
98,47	0,45	0,09	0,09	0,09	0,81
Lecturers: PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, Mgr. Jana Leginusová, Mgr. Tomáš Kuchár, PhD., PaedDr. Mikuláš Ortutay, Mgr. Martin Dovičák, PhD., Mgr. Branislav Nedbálek, Mgr. Júlia Raábová, PhD., Mgr. Tomáš Lovecký					
Last change: 15.03.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFL.KJFB/2-FJF-115/15		Course title: Physics of the Atomic Nucleus			
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 2 / 1 per level/semester: 26 / 13 Form of the course: on-site learning					
Number of credits: 4					
Recommended semester: 1.					
Educational level: II.					
Prerequisites:					
Course requirements: Evaluation during the semester: midterm test Final evaluation: oral exam Scale for final grades: A 90%, B 80%, C 70%, D 60%, E 50%					
Learning outcomes: The student gains the understanding of the physics of atomic nuclei, their basic theoretical description and properties of radioactive decays. Acquired knowledge allows the student to estimate and evaluate the basic properties of atomic nuclei and extract the information from the data obtained in the experiments.					
Class syllabus: Summary of basic nuclear models and nuclear potential. Spherical and deformed shell model. Deformation of the nucleus and its collective excitation. Radioactive decay (Q value, selection rules, hindrance factors). The excited state of nuclei, gamma transition, internal conversion. The nuclear fission process (fission barrier, spontaneous and induced fission). Nuclear isomers. Detection of emitted particles.					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 38					
A	B	C	D	E	FX
76,32	5,26	10,53	0,0	7,89	0,0
Lecturers: doc. Mgr. Stanislav Antalic, PhD.					
Last change: 21.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJFB/2-FJF-106/00		Course title: Practical Exercises in Nuclear Physics and Electronics			
Educational activities: Type of activities: laboratory practicals Number of hours: per week: 4 per level/semester: 52 Form of the course: on-site learning					
Number of credits: 4					
Recommended semester: 1.					
Educational level: II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus: Practical exercises consist of: - the Laboratory work in Nuclear Physics (- Determine energy deposited in alfa, beta, gama and neutron detectors, Practically to familiarize with method of radioactivity measurement) - the Laboratory work in Nuclear Electronics (- Nuclear detector signal pulse shaping, Pulse application of amplifier in the timing and energy measurement, ADC - digitization of pulse high techniques, Timing measurement with coincidence sytem)					
Recommended literature: Manual to practical exercises on web URL - http://www.dnp.fmph.uniba.sk/~kollar/navodnik.htm . Florek.:Praktikum z jadrovej fyziky a elektroniky. Textbook MFF UK 1982. D.Kollár: Praktikum z elektroniky a automatizácie. Textbook MFF UK 1991.					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 85					
A	B	C	D	E	FX
75,29	23,53	1,18	0,0	0,0	0,0
Lecturers: Mgr. Ivan Kontuľ, PhD., Mgr. Róbert Breier, PhD., Mgr. Jakub Zeman, PhD.					
Last change: 02.06.2015					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJFB/2-FJF-250/17		Course title: Practicum of Data Analysis in Particle Physics			
Educational activities: Type of activities: laboratory practicals Number of hours: per week: 3 per level/semester: 39 Form of the course: on-site learning					
Number of credits: 4					
Recommended semester: 3.					
Educational level: II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 0					
A	B	C	D	E	FX
0,0	0,0	0,0	0,0	0,0	0,0
Lecturers: Mgr. Róbert Astaloš, PhD., Mgr. Pavol Bartoš, PhD.					
Last change: 10.05.2017					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJFB/2-FJF-245/00		Course title: Praktical in Monitoring of Radioactivity in the Environment			
Educational activities: Type of activities: laboratory practicals Number of hours: per week: 5 per level/semester: 65 Form of the course: on-site learning					
Number of credits: 5					
Recommended semester: 4.					
Educational level: II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus: Determination of integral alfa and beta activity. Determination of 232-Th, 226-Ra and 40-K in natural samples using semiconductor gamma spectrometry. Measurement of 3-H using liquid scintillation spectrometry. Measurement of 14-C using gaseous proportional detector. Determination of 226-Ra in water using emanometric method. Determination of radon concentration in water and soil air. Alfa spectrometric determination of 218-Po and 214-Po in air. Applications of XRF method for control of pollutants in the environment.					
Recommended literature: Actual scientific publications. Slovak technical norms for radioactivity measurement. Š.Šáro: Detekcia a spektrometria žiarenia alfa a beta. Alfa Bratislava,1983.					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 9					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
Lecturers: doc. RNDr. Karol Holý, CSc., doc. RNDr. Ivan Sýkora, PhD., doc. RNDr. Monika Müllerová, PhD.					
Last change: 02.06.2015					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJFB/2-FJF-121/00		Course title: Processing of Nuclear Physics Data			
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 3					
Recommended semester: 1.					
Educational level: II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus: Describing the data, theoretical distributions, errors, estimations – likelihood function, basic estimators, maximum likelihood, the method of moments, least squares method, χ^2 distribution, proof of the χ^2 distribution. Probability and confidence – basic terms, mathematical probability, Bayesian statistics, confidence level, binomial confidence intervals, Poisson confidence intervals. Taking decisions – hypothesis testing (significance, power, Neyman Pearson test), interpreting experiments, the null hypothesis, binomial probabilities, goodness of fit, χ^2 test, the run test, the Kolgomorov test. Two sample problem, matched and correlated samples. Ranking methods – nonparametric methods, Mann-Whitney test, matched pairs, Wilcoxon`s matched pairs signed rank test, measures of agreement – Spearmen`s correlation coefficient, concordance. Usage of computers for data processing and software features.					
Recommended literature: J. Hanousek, P. Charamza: Moderní metody zpracování dat, Educa`99, Praha, 1992 R. Barlow: Statistics, (Manchester Physics Series), J. Wiley&Sons, Chichester, 1999 L.Lyons: Statistics for nuclear and particle physicist, Cambridge University Press, 1992					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 74					
A	B	C	D	E	FX
58,11	20,27	9,46	10,81	1,35	0,0
Lecturers: doc. RNDr. Ivan Sýkora, PhD.					
Last change: 02.06.2015					

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJFB/2-FJF-128/16		Course title: Quantum Theory for Nuclear Physicists			
Educational activities: Type of activities: lecture / practicals Number of hours: per week: 3 / 1 per level/semester: 39 / 13 Form of the course: on-site learning					
Number of credits: 5					
Recommended semester: 1.					
Educational level: II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus:					
Recommended literature:					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 29					
A	B	C	D	E	FX
62,07	20,69	10,34	6,9	0,0	0,0
Lecturers: prof. RNDr. Fedor Šimkovic, CSc., Mgr. Dušan Štefánik, PhD.					
Last change: 20.05.2016					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJFB/2-FJF-126/00	Course title: Radiation Environmental Physics
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning	
Number of credits: 3	
Recommended semester: 2.	
Educational level: II.	
Prerequisites:	
Course requirements: Final assessment: written examination, oral examination Indicative evaluation scale: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 0/100	
Learning outcomes: Students will gain an understanding of the sources, distribution, migration, dispersion, measurement and applications of radionuclides in the environment.	
Class syllabus: <ol style="list-style-type: none"> 1. Sources of ionizing radiation in the biosphere. Primordial and cosmogenic radionuclides. 2. Anthropogenic radionuclides. Ecologically significant radionuclides, radiotoxicity. 3. Distribution, migration and transport of radionuclides in nature. 4. Basic characteristics of radon, solubility, potential alpha energy, equivalent activity concentration. 5. Accumulation of radon decay products. 6. Radon in the outdoor atmosphere, in soil and in living quarters, risk of exposure. 7. Methods of monitoring environmental contamination and environmental processes, reasons for measurement of ^{226}Ra, ^{232}Th, ^{40}K in soils and building materials 8. Measurement of radioactivity in the atmosphere, soil and water, measurement of ^{222}Rn in living quarters and soil. 9. Neutron activation and X-ray fluorescence analysis of environmental pollutants. 10. Effective dose from inhalation of radionuclides. 11. Dose rate from terrigenous radionuclides. 12. Use of radionuclides as tracers of natural processes. 13. National regulations and international recommendations for protection against ionizing radiation. 	
Recommended literature: Holá O., Holý K.: Radiačná ochrana : Ionizujúce žiarenie, jeho účinky a ochrana pred ionizujúcim	

žiarením. - 1. vyd. - Bratislava : Slovenská technická univerzita, 2010. Baskaran M.: Radon: A Tracer for Geological, Geophysical and Geochemical Studies, Springer, 2016 R. Tykva, D. Berg: Man-Made and Natural Radioactivity in Environmental Pollution and Radiochronology, Kluwer Academic Publishers, 2004 P.P.Povinec, J.A.Sanchez-Cabeza: Radionuclides in the Environment, Elsevier, 2006					
Languages necessary to complete the course: Slovak, English					
Notes:					
Past grade distribution Total number of evaluated students: 63					
A	B	C	D	E	FX
63,49	15,87	15,87	1,59	1,59	1,59
Lecturers: doc. RNDr. Karol Holý, CSc.					
Last change: 22.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJFB/2-FJF-141/15		Course title: Rare Nuclear Processes			
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 3					
Recommended semester: 2.					
Educational level: II.					
Prerequisites:					
Course requirements: written examination, oral examination Approximate grade thresholds: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 100/0					
Learning outcomes: Mastering knowledge of the rare nuclear processes and experimental methods used in their research.					
Class syllabus: Higher order processes. Internal Bremsstrahlung. Internal production of electron-positron pairs. Excitation of the electron shell of an atom. Internal conversion. Nuclear isomerism. Neutrino-less double beta decay. Searching for dark matter. Electromagnetic transitions in nuclei. Methodology of experimental research of rare nuclear processes. Low-background gamma-spectrometry. Low-background laboratories. Low-background experiments, underground laboratories					
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: doc. RNDr. Jaroslav Staníček, PhD.					
Last change: 20.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJP/1-MXX-161/00		Course title: Russian Language (1)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 1.					
Educational level: I., II.					
Prerequisites:					
Course requirements: Scale of assessment (preliminary/final): 100/0					
Learning outcomes: Basic communication in Russian, developing other Russian language skills - listening comprehension, reading and writing.					
Class syllabus: To master the fundamentals of general Russian. The language level is A1. Learning the Cyrillic (Russian) alphabet, gaining basic language competence, building up skills and confidence in dealing with unfamiliar authentic and semi-authentic texts. The subject provides a course in Russian language for beginners.					
Recommended literature: The textbook: : Точка Ру А1 (Ольга Долматова, Екатерина Новачац), pracovné karty Падежи 1 (Л.С. Безкоровайная, В.Е. ШТЫЛЕНКО).					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 707					
A	B	C	D	E	FX
58,56	16,55	11,03	4,38	1,84	7,64
Lecturers: Viktoria Mirsalova					
Last change: 20.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJP/1-MXX-162/00		Course title: Russian Language (2)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 2.					
Educational level: I., II.					
Prerequisites:					
Course requirements: Scale of assessment (preliminary/final): 100/0					
Learning outcomes: Basic communication in Russian, developing other Russian language skills - listening comprehension, reading and writing.					
Class syllabus: To master the fundamentals of general Russian. Learning the Cyrillic (Russian) alphabet, gaining basic language competence, building up skills and confidence in dealing with unfamiliar authentic and semi-authentic texts. The subject continues the program of Russian language (1) and provides a course of Russian for beginners.					
Recommended literature: Textbook: Точка Ру А1 (Ольга Долматова, Екатерина Новачац), pracovné karty Падежи 1 (Л.С. Безкоровайная, В.Е. Штыленко).					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 421					
A	B	C	D	E	FX
65,08	15,68	8,79	3,8	0,95	5,7
Lecturers: Viktoria Mirsalova					
Last change: 20.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJP/1-MXX-261/00		Course title: Russian Language (3)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 3.					
Educational level: I., II.					
Prerequisites:					
Course requirements: Scale of assessment (preliminary/final): 100/0					
Learning outcomes: Basic communication in Russian, developing other Russian language skills - listening comprehension, reading and writing.					
Class syllabus: Learning the handwritten Russian (Russian Cursive Cyrillic), developing further language skills, gaining knowledge of Russian culture, history and way of life, pre-intermediate to intermediate grammar and vocabulary. The course "Russian for Intermediate Students" is a follow-up to "Russian for Beginners". The subject of the course is general Russian in the range appropriate to the given level.					
Recommended literature: Точка Ру А2 (Ольга Долматова, Екатерина Новачац) а Short Stories in Russian (Olly Richards, Alex Rowlings)					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 200					
A	B	C	D	E	FX
70,5	17,5	8,5	2,5	0,0	1,0
Lecturers: Viktoria Mirsalova					
Last change: 20.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJP/1-MXX-262/00		Course title: Russian Language (4)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 4.					
Educational level: I., II.					
Prerequisites:					
Course requirements: Scale of assessment (preliminary/final): 100/0					
Learning outcomes: Learning the handwritten Russian (Russian Cursive Cyrillic), developing further language skills, gaining knowledge of Russian culture, history and way of life, pre-intermediate to intermediate grammar and vocabulary.					
Class syllabus: Learning the handwritten Russian (Russian Cursive Cyrillic), developing further language skills, gaining knowledge of Russian culture, history and way of life, pre-intermediate to intermediate grammar and vocabulary. The course "Russian for Intermediate Students" is a follow-up to "Russian for Beginners". The subject of the course is general Russian in the range appropriate to the given level.					
Recommended literature: Точка Ру А2 (Ольга Долматова, Екатерина Новачац) а Short Stories in Russian (Olly Richards, Alex Rowlings)					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 144					
A	B	C	D	E	FX
75,69	13,19	6,94	2,78	0,69	0,69
Lecturers: Viktoria Mirsalova					
Last change: 20.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJFB/2-FJF-232/00	Course title: Selected Chapters in Gamma Spectroscopy
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning	
Number of credits: 3	
Recommended semester: 3.	
Educational level: II.	
Prerequisites:	
Course requirements: Exam: written and oral exam, successful completion of the written part is condition of the oral part. Share in the overall rating: 80/20. Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 0/100	
Learning outcomes: After completing the course, students will be able to use several aspects of spectrometric methods as well as new types of detection systems.	
Class syllabus: Creation and formig of signals in semiconductor detectors, principles of operation and types of semiconductor detectors, characteristic of semiconductor detectors, the signal transmission, electronics for pulse signal processing, perturbing influence of heavy current distribution, cryogenic detectors – types, principles of operation, physical applications.	
Recommended literature: W.R. Leo, Techniques for nuclear and particle physics, Springer Verlag, Berlin, 1996 J. V. Melikov, Experimentalnaja tehnika v jadernoj fizike, MGU, Moskva, 1973 K. Klainknecht, Detectors for particle radiation, Cambridge University Press, 1998 J. Šeda, J. Sabol, J. Kubálek, Jaderná elektronika, SNTL, Praha, 1977 N. E. Booth, B. Cabrera, E. Fiorini, Low temperature particle detectors, Ann. Rev. Nucl. Part. Sci. ,46, 1996	
Languages necessary to complete the course: slovak, english	
Notes:	

Past grade distribution					
Total number of evaluated students: 21					
A	B	C	D	E	FX
52,38	42,86	4,76	0,0	0,0	0,0
Lecturers: doc. RNDr. Ivan Sýkora, PhD.					
Last change: 21.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJFB/2-FJF-203/00		Course title: Seminar in Nuclear and Subnuclear Physics			
Educational activities: Type of activities: seminar Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 4.					
Educational level: II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus: Presentation of modern trends in nuclear and sub-nuclear physics, new achievements in the field of interest. Presentation of the scientific programs of large international nuclear institutes as CERN Geneva, JINR Dubna, GSI Darmstadt, DESY Hamburg, Fermilab, etc.					
Recommended literature: WEB sites of nuclear physics institutes, Journals: Physics Today, CERN Courier, Progress in Physics, Scientific American, Nuclear Physics News, Europhysics News, Nuclear Physics News International and others.					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 79					
A	B	C	D	E	FX
98,73	0,0	1,27	0,0	0,0	0,0
Lecturers: prof. RNDr. Jozef Masarik, DrSc.					
Last change: 02.06.2015					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJP/1-MXX-171/20		Course title: Slovak Language for Foreign Students (1)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 1.					
Educational level: I., II.					
Prerequisites:					
Course requirements: tests Course prerequisites: https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/poziadavky-na-udelenie-priebežneho-hodnotenia-aj1aj2aj3-ostatne-kurzy/ Scale of assessment (preliminary/final): 100/0					
Learning outcomes: This course is aimed for foreign students to learn the fundamentals of the Slovak language with the focus on basic communication as well as all other language skills- listening comprehension,reading and writing.					
Class syllabus: The syllabus is targeted at the comprehension of the basics of the Slovak language for the absolute beginners (A1).					
Recommended literature: Križom- Krážom Slovenčina 1, additional material to further support the covered topics.					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 23					
A	B	C	D	E	FX
47,83	0,0	0,0	0,0	0,0	52,17
Lecturers: Mgr. Aneta Barnes					
Last change: 21.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJP/1-MXX-172/20		Course title: Slovak Language for Foreign Students (2)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 2.					
Educational level: I., II.					
Prerequisites:					
Course requirements: tests Course prerequisites: https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/poziadavky-na-udelenie-priebezhneho-hodnotenia-aj1aj2aj3-ostatne-kurzy/ Scale of assessment (preliminary/final): 100/0					
Learning outcomes: This course is aimed for foreign students to learn the fundamentals of the Slovak language with the focus on basic communication as well as all other language skills- listening comprehension, reading and writing.					
Class syllabus: The syllabus is targeted at the comprehension of the basics of the Slovak language for the absolute beginners (A1) and this course is a follow up course to the Slovak language course 1.					
Recommended literature: Križom- Krážom Slovenčina 1, additional material to further support the covered topics					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 22					
A	B	C	D	E	FX
81,82	0,0	4,55	0,0	0,0	13,64
Lecturers: Mgr. Aneta Barnes					
Last change: 21.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJP/1-MXX-271/20		Course title: Slovak Language for Foreign Students (3)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 3.					
Educational level: I., II.					
Prerequisites:					
Course requirements: tests Course prerequisites: https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/poziadavky-na-udelenie-priebežneho-hodnotenia-aj1aj2aj3-ostatne-kurzy/ Scale of assessment (preliminary/final): 100/0					
Learning outcomes: This course is aimed for foreign students to better comprehend all the language skills important to enable correct usage of the Slovak language – listening comprehension, reading, writing and speaking.					
Class syllabus: The syllabus is targeted at the comprehension of all the language skills of the Slovak language , and it is a follow up course to the Slovak language course 2.					
Recommended literature: Križom-Krážom Slovenčina 2, additional material to further support the covered topics.					
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. Aneta Barnes					
Last change: 21.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJP/1-MXX-272/20		Course title: Slovak Language for Foreign Students (4)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 2					
Recommended semester: 4.					
Educational level: I., II.					
Prerequisites:					
Course requirements: tests Course prerequisites: https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/poziadavky-na-udelenie-priebežneho-hodnotenia-aj1aj2aj3-ostatne-kurzy/ Scale of assessment (preliminary/final): 100/0					
Learning outcomes: This course is aimed for foreign students to better comprehend all the language skills important to enable correct usage of the Slovak language – listening comprehension, reading, writing and speaking.					
Class syllabus: The syllabus is targeted at the comprehension of all the language skills of the Slovak language , and it is a follow up course to the Slovak language course 3.					
Recommended literature: Križom-Krážom Slovenčina 2, additional material to further support the covered topics.					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 7					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
Lecturers: Mgr. Aneta Barnes					
Last change: 21.06.2022					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJFB/2-FJF-109/00		Course title: Special Practical in Nuclear Physics (1)			
Educational activities: Type of activities: laboratory practicals Number of hours: per week: 4 per level/semester: 52 Form of the course: on-site learning					
Number of credits: 4					
Recommended semester: 2.					
Educational level: II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus: Half-time decay measurement of the long life isotopes, determining the concentration of some isotopes in the enviroment, α , β , γ radiation spectrometry by ionization chamber, semiconductor and scintilation detectors, fission fragment spectrometry, measurement of the nucleus radius, neutron activation analysis, detection of neutrons and determination of the neutron flux.					
Recommended literature: M. Florek a kol. Practical from nuclear physics and electronic, UK edition center, 1990					
Languages necessary to complete the course:					
Notes:					
Past grade distribution Total number of evaluated students: 81					
A	B	C	D	E	FX
67,9	24,69	7,41	0,0	0,0	0,0
Lecturers: RNDr. Imrich Szarka, CSc.					
Last change: 02.06.2015					
Approved by:					

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJFB/2-FJF-209/00		Course title: Special Practical in Nuclear Physics (2)			
Educational activities: Type of activities: laboratory practicals Number of hours: per week: 5 per level/semester: 65 Form of the course: on-site learning					
Number of credits: 5					
Recommended semester: 3.					
Educational level: II.					
Prerequisites:					
Course requirements: Continuous assessment: individual work, elaboration of protocols final evaluation: presentation of results Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%					
Learning outcomes: After completing the course, students will be able to use nuclear spectrometry methods to solve practical problems.					
Class syllabus: Determining of relative intensities of gamma rays using the scintillation detector. Usage of the liquid scintillation spectrometry for the alpha and beta spectra analysis. Principles of application of directional scintillation detector. Characteristics of Ge(Li) and HPGe detectors, methods of evaluation of the peak efficiency of HPGe detector, multicomponent spectra analysis. Coincidence methods of gamma-ray spectrometry. The analysis of the ¹⁵² Eu decay scheme.					
Recommended literature: S. Usačev a kol.: Experimentálna jadrová fyzika, ALFA-SNTL, Bratislava 1982 Š.Šáro : Detekcia a spektrometria žiarenia alfa a beta. Alfa, Bratislava, 1983 G.F. Knoll: Radiation Detection and Measurement, John Wiley & Sons, 2000 W.R. Leo: Techniques for Nuclear and Particle Physics Experiments, Springer Verlag, 1994					
Languages necessary to complete the course: slovak, english					
Notes:					
Past grade distribution Total number of evaluated students: 81					
A	B	C	D	E	FX
92,59	4,94	1,23	0,0	0,0	1,23
Lecturers: doc. RNDr. Jaroslav Staniček, PhD., doc. RNDr. Ivan Sýkora, PhD.					

Last change: 20.06.2022
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFL.KTV/2-MXX-115/17		Course title: Sports in Natur (1)			
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: 1.					
Educational level: II.					
Prerequisites:					
Course requirements: Grades: A 90%, B 80%, C 70%, D 60%, E 50% The condition for the award of 1 or 2 credits is the completion of a multi-day course in its full scope, or the completion of one-day courses in the scope of 4 days. Candidates can apply to the leaders of individual courses. From the presented offer of courses, you can choose the one that suits your interests, abilities and deadlines.					
Learning outcomes: Acquisition and development of basic motor skills and abilities in selected sports: skiing and snowboarding. Mastering the correct technique of performing individual movements, which are necessary for skiing and snowboarding.					
Class syllabus: The student can sign up for the outdoor sports courses offered by the department: skiing, snowboarding. The lessons in the courses are focused on the development of basic and special movement skills and mastering the techniques needed for the sports.					
Recommended literature:					
Languages necessary to complete the course: Slovak					
Notes: KTVŠ does not rent ski equipment.					
Past grade distribution Total number of evaluated students: 83					
A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0
Lecturers: Mgr. Martin Dovičák, PhD., Mgr. Tomáš Kuchár, PhD., Mgr. Jana Leginusová, PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, PaedDr. Mikuláš Ortutay, Mgr. Júlia Raábová, PhD.					

Last change: 16.06.2022
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFL.KTV/2-MXX-116/18		Course title: Sports in Natur (2)			
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: 2.					
Educational level: II.					
Prerequisites:					
Course requirements: Grades: A 90%, B 80%, C 70%, D 60%, E 50%. The condition for the award of 1 or 2 credits is the completion of a multi-day course in its full scope, or the completion of one-day courses in the scope of 4 days. Candidates can apply to the leaders of individual courses. From the presented offer of courses, you can choose the one that suits your interests, abilities and deadlines.					
Learning outcomes: Creating a positive and lasting relationship with physical activity. Acquisition and mastery of basic motor skills and abilities in outdoor sports: windsurfing, beach volleyball, water tourism - river rafting, hiking and other sports according to interest. Training and improving the technique needed for the sports.					
Class syllabus: The student can sign up for the outdoor sports courses offered by the department: water tourism - river rafting, windsurfing, beach volleyball, hiking and other hobby sports. The lessons in the courses are focused on the development of basic and special movement skills and, mastering the techniques needed for the sports.					
Recommended literature:					
Languages necessary to complete the course: Slovak					
Notes: KTVŠ will provide sports equipment.					
Past grade distribution Total number of evaluated students: 50					
A	B	C	D	E	FX
94,0	0,0	0,0	0,0	0,0	6,0

Lecturers: Mgr. Martin Dovičák, PhD., Mgr. Tomáš Kuchár, PhD., Mgr. Jana Leginusová, PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, PaedDr. Mikuláš Ortutay, Mgr. Júlia Raábová, PhD., Mgr. Tomáš Lovecký
Last change: 16.06.2022
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJFB/2-FJF-143/16	Course title: Standard Model from Experimentalist Point of View
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning	
Number of credits: 3	
Recommended semester: 2.	
Educational level: II.	
Prerequisites:	
Course requirements: Interim evaluation: homeworks Final assessment: in case of no homeworks received, written exam Indicative evaluation scale: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): Weight of interim / final evaluation: 100/0	
Learning outcomes: By absolving the course, students achieve overview and will understand basics of the Standard model (SM).	
Class syllabus: <ol style="list-style-type: none"> 1. Basic concept of the high energy physics. Fundamental particles and forces in the SM. 2. Detection of particles in high energy physics. Experimental characteristics of quarks and gluons. 3. Basic ideas of the SM. Particles vs field, calibration symmetries and interaction. 4. SM and Higgs boson. Spontaneous symmetry breaking and mass of the particles. 5. Top quark physics. Top quark production cross sections – theory and experiment. 6. Measurements of the top quark production cross-sections. 7. Jets, jet energy measurement, jet energy scale. 8. Top quark mass as important parameter of the SM. Top quark mass determination. 9. Vector bosons W and Z. Reconstruction of vector bosons and measurement of their masses. 10. Electroweak production of the top quark. Direct measurement of the CKM matrix element V_{tb}. 11. Asymmetries in particle physics. Asymmetries as consequence of interference. 12. Beyond SM physics. Necessity of the physics beyond SM. 13. Where to look for a physics beyond SM, how to search for a new physics. 	
Recommended literature: Dynamics of the Standard Model, Cambridge University Press 1992/ J. F. Donoghue, E. Golowich, B. R. Holstein Gauge Theories in Particle Physics: A Practical Introduction. Institute of Physics. ISBN 978-0-585-44550-2./ I. Aitchison, A. Hey (2003).	

Quarks and leptons: An introductory course in modern particle physics /F. Halzen, A.D. Martin:
John Wiley, 1984

Languages necessary to complete the course:

slovak, english

Notes:

Past grade distribution

Total number of evaluated students: 16

A	B	C	D	E	FX
31,25	50,0	6,25	6,25	0,0	6,25

Lecturers: Mgr. Róbert Astaloš, PhD., Mgr. Pavol Bartoš, PhD., prof. RNDr. Stanislav Tokár, DrSc.

Last change: 22.06.2022

Approved by:

STATE EXAM DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KJFB/2-FJF-959/15	Course title: Sub-nuclear Physics
Number of credits: 2	
Educational level: II.	
State exam syllabus:	
Last change: 02.06.2015	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022					
University: Comenius University Bratislava					
Faculty: Faculty of Mathematics, Physics and Informatics					
Course ID: FMFI.KJFB/2-FJF-231/00		Course title: Theory of Many-Nucleon Systems			
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 26 Form of the course: on-site learning					
Number of credits: 3					
Recommended semester: 3.					
Educational level: II.					
Prerequisites:					
Course requirements:					
Learning outcomes:					
Class syllabus: Nucleon-nucleon interaction (one-boson exchange potential), phase analysis of NN interaction, G-matrices (Bethe-Goldstone equation), Slater determinant, second quantization, Hartree-Fock theory, description of excited states of nucleus, Tamm-Dancoff approximation, nuclear ground state correlations, random phase approximation (RPA), RPA equation, sum rules, proton-proton, neutron-neutron and proton-neutron pairing interactions, Hartree-Fock Bogoliubov transformation, Barden-Cooper-Schrieffer (BCS) equation, quasiparticle RPA, giant resonances (Gamow-Teller, isobaric analogue states), many-body Green functions of beta transitions, many-body studies within schematic models (Lipkin model, SO(5) model), Monte-Carlo shell model S-matrix and its expansion, mean field theory, Brueckner G-matrices, Walecka model.					
Recommended literature: G.E. Brown: Many-body problems P.Ring P. Schuck: The nuclear many-body problem J. Eisenberg, B. Greiner: Nuclear Theory D.A. Kirzhnits: Field Theoretical Methods in Many-Body Systems J.D. Walecka: Quantum Theory of Many-particle systems					
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. Fedor Šimkovic, CSc., Mgr. Dušan Štefánik, PhD.					

Last change: 02.06.2015
Approved by: