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| University: P. J | University: P. J. Šafárik University in Košice | | | | | |
|---|---|-------------------|--------------|---|----|--|
| Faculty: Facult | y of Science | | | | | |
| Course ID: KF/ AFS/05 | Course ID: KF/ AFS/05Course name: Ancient Philosophy and Present Times | | | | | |
| Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 2 Per study period: 28 Course method: present | | | | | | |
| Number of EC | TS credits: 2 | | | | | |
| Recommended | semester/trimes | ster of the cours | e: 2. | = | | |
| Course level: II | - | | | | | |
| Prerequisities: | | | | | | |
| Conditions for | course completi | ion: | | | | |
| Learning outco | omes: | | | | | |
| Brief outline of | the course: | | | | | |
| Recommended | literature: | | | | | |
| Course languag | ge: | | | | | |
| Notes: | | | | | | |
| Course assessment Total number of assessed students: 31 | | | | | | |
| А | В | С | D | Е | FX | |
| 80.65 6.45 6.45 0.0 6.45 0.0 | | | | | | |
| Provides: Doc. PhDr. Peter Nezník, CSc. | | | | | | |
| Date of last mo | dification: 17.09 | 9.2020 | | | | |
| Approved: prof | f. RNDr. Michal | Jaščur, CSc. | | _ | | |

| University: P. J | University: P. J. Šafárik University in Košice | | | | | | |
|--|--|---|--|--|--|-----------------------------------|--|
| Faculty: Facult | y of Sci | ience | | | | | |
| Course ID: ÚF APR/17 | Course ID: ÚFV/ Course name: Astronomical instrumetation | | | | | | |
| Course type, sc Course type: I Recommended Per week: 3 / 2 Course metho | ope an Lecture l cours l Per st d: preso | d the me / Practice e-load (h tudy peri ent | thod: e nours): iod: 42 / 14 | | | | |
| Number of EC | ГS cred | lits: 6 | | | | | |
| Recommended | semest | er/trime | ster of the course | e: 1. | | | |
| Course level: II | - | | | | | | |
| Prerequisities: | | | | | | | |
| Conditions for 2 tests during se examination an | course emester d test. | complet Each test | ion: st for 15 points. M | linimal amounts | s of points for an e | xam is 20. Oral | |
| Learning outco Acquaint studer and light detect | mes: nts with ors in d | n constru lifferent s | ction of astronom pectral regions. | ical telescopes, | correction of opt | ical aberationss | |
| Brief outline of Principles of ge construction, ra CMOS, princip | the construction the co | urse: cal optics escopes, hotometr | s, optical errors ar satellite UV and y, spectroscopy as | nd their correcti X-ray telescop nd polarimetry. | ons, types of teles bes, detectors of t | copes and their he light: CCD, | |
| Recommended literature: 1. Howell : 2000, Handbook of CCD Astronomy, Cambridge University Press. 2. Cheng, J.: 2009, The Principles of Astronomical Telescope Design, Springer-Verlag 3. Lena et al.: 1996, Observational Astrophysics, Springer-Verlag 4. Martinez a Klotz: 1998, A practical giude to CCD Astronomy, Cambridge University Press. 5. Romano: 2009, Geometric Optics: Theory and Design of Astronomical Optical Systems Using Mathematica 6 Schroeder: 1999, Astronomical Optics, Academic Press. | | | | | | | |
| Course language: Slovak, English | | | | | | | |
| Notes: | | | | | | | |
| Course assessment | | | | | | | |
| A | | B | C | D | Е | FX | |
| 66.67 | 66.67 0.0 33.33 0.0 0.0 0.0 | | | | | | |
| Provides: doc. 1 | Mgr. Šte | efan Pari | mucha, PhD. | | | | |
| Date of last mo | dificati | ion: 26.0 | 9.2017 | | | | |
| L | | | | | | | |

| University: P. J. | Šafárik Univer | sity in Košice | | | |
|--|---|-------------------|--------------|-----------------|-------------|
| Faculty: Faculty | of Science | - | | | |
| Course ID: ÚFV/ Course name: Astronomy and Astrophysics MSSAA/14 Course name: Astronomy and Astrophysics | | | | | |
| Course type, sco Course type: Recommended Per week: Per Course methoo | ope and the me course-load (l study period: l: present | thod: nours): | | | |
| Number of ECT | S credits: 4 | | | | |
| Recommended | semester/trime | ster of the cours | e: | | |
| Course level: II. | | | | | |
| Prerequisities: U MPH1/13,ÚFV/I | ÚFV/NME/17,Ú FSL1/13 | ÚFV/TAF1/13,ÚF | V/TAF2/13,ÚF | V/ESP1/13,ÚFV/F | PHD/17,ÚFV/ |
| Conditions for a | course complet | ion: | | | |
| Learning outco | mes: | | | | |
| Brief outline of | the course: | | | | |
| Recommended | literature: | | | | |
| Course languag | e: | | | | |
| Notes: | | | | | |
| Course assessment Total number of assessed students: 7 | | | | | |
| A | В | C | D | E | FX |
| 85.71 | 0.0 | 0.0 | 0.0 | 14.29 | 0.0 |
| Provides: | | | | | |
| Date of last mod | Date of last modification: 23.05.2017 | | | | |
| Approved: prof. | RNDr. Michal | Jaščur, CSc. | | | |

| University: P. J. | Šafárik Univers | ity in Košice | | | | | | |
|--|--|---|-----------|--|--|--|--|--|
| Faculty: Faculty | of Science | | | | | | | |
| Course ID: ÚFV APMM/19 | V/ Course na | Course name: Atomistic Computer MOdeling of Materials | | | | | | |
| Course type, sc Course type: I Recommended Per week: 2 / 1 Course method | Course type, scope and the method: Course type: Lecture / Practice Recommended course-load (hours): Per week: 2 / 1 Per study period: 28 / 14 Course method: present | | | | | | | |
| Number of ECT | FS credits: 5 | | | | | | | |
| Recommended | semester/trime | ster of the course | e: 2., 4. | | | | | |
| Course level: II | - | | | | | | | |
| Prerequisities: | | | | | | | | |
| Conditions for | course complet | on: | | | | | | |
| Learning outco | mes: | | | | | | | |
| Brief outline of the course: Crash course to Many-body Schrödinger Equation, Introduction to Density Functional Theory, Numerical Methods for Realistic Calculations, Equilibrium Structures of Materials, Elastic Properties of Materials, Vibration of Molecules and Solids, Phonons and Vibrational Spectroscopy, Photoelectron Spectroscopy, Dielectric Function and Optical Spectra, Density Functional Theory and Magnetic Materials Recommended literature: F. Giustino, Materials Modelling using Density Functional Theory, Oxford University Press 2014; J. Kohanoff, Electronic Structure Calculations for Solids and Molecules, Cambridge University Press 2006; M. P. Marder, Condensed Matter Physics, John Wiley & Sons 2010; R. M. Martin, Electronic Structure, Cambridge University Press 2004; S. Bluegel et al., Computing Solids, Lecture Notes of the 45th IFF Spring School 2014. | | | | | | | | |
| Course languag | ge: | | | | | | | |
| Notes: | | | | | | | | |
| Course assessment Total number of assessed students: 1 | | | | | | | | |
| Α | A B C D E FX | | | | | | | |
| 100.0 | 100.0 0.0 0.0 0.0 0.0 | | | | | | | |
| Provides: RND | Provides: RNDr. Martin Gmitra, PhD. | | | | | | | |
| Date of last mo | dification: 07.03 | 5.2020 | | | | | | |
| Approved: prof | . RNDr. Michal | Jaščur, CSc. | | | | | | |
| | | | | | | | | |

Г

| University: P. J. | Šafárik Univers | sity in Košice | | | | | |
|---|---|--------------------------|------------------|-------------------|----------------|--|--|
| Faculty: Faculty | y of Science | | | | | | |
| Course ID: ÚF NME/17 | Ourse ID: ÚFV/ Course name: Celestial mechanics ME/17 Image: Celestial mechanics | | | | | | |
| Course type, scope and the method: Course type: Lecture / Practice Recommended course-load (hours): Per week: 3 / 1 Per study period: 42 / 14 Course method: present | | | | | | | |
| Number of EC | FS credits: 7 | | | | | | |
| Recommended | semester/trime | ster of the cours | e: 1. | | | | |
| Course level: II | • | | | | | | |
| Prerequisities: | | | | | | | |
| Conditions for 2 tests in the ra of points for an Oral exam | course completinge of calculate exam is 10. | ion: d examples on th | ne exercises eac | h for 10 point. M | inimal amounts | | |
| Learning outco Acquaint studer its application t orbits of "n" bo | Learning outcomes: Acquaint students with foundations of the celestial mechanics, solution of two body problem and its application to bodies of the Solar system and will learn to perform a numerical integration of orbits of "n" bodies. | | | | | | |
| Brief outline of | the course: | | | | | | |
| Recommended literature: 1. Andrle P., Základy nebeské mechaniky. Academia, Praha, 1971 2. Boccaletti D., Pucacco G.: Theory of Orbits (Vol. 1 and Vol. 2), Springer, Berlin, 2001. 3. Brouwer D., Clemence G. M.: Methods of Celestial Mechanics, Academia Press, New York and London, 1961 4. Everhart E.: An efficient integrator that uses Gauss-RADAU spacings. In: Dynamics of Comets: Their Origin and Evolution, eds. A. Carusi and G. B. Valsecchi, Reidel, Dordrecht, pp. 185\$-\$202. 5. Puankare A.: Lekcii po nebesnoj mechanike. Nauka, Moskva, 1965. 6. Roy A. E., Orbital Motion, Adam Hilger Ltd., Bristol, 1978 7. Vanýsek V., Základy astronomie a astrofyziky, Academia, Praha, 1980. | | | | | | | |
| Course language: slovak, english | | | | | | | |
| Notes: | | | | | | | |
| Course assessment Total number of assessed students: 7 | | | | | | | |
| A | В | С | D | E | FX | | |
| 57.14 | 0.0 | 14.29 | 0.0 | 28.57 | 0.0 | | |

Provides: RNDr. Ľuboš Neslusan, CSc.

Date of last modification: 26.09.2017

| University: P. J | . Šafárik Univers | ity in Košice | | | |
|---|---|-------------------|--------------|---|----|
| Faculty: Facult | y of Science | | | | |
| Course ID: KF/ KDF/05 | Course ID: KF/ KDF/05Course name: Chapters from History of Philosophy of 19th and 20th Centuries (General Introduction) | | | | |
| Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 2 Per study period: 28 Course method: present | | | | | |
| Number of EC | TS credits: 2 | | | | |
| Recommended | semester/trimes | ster of the cours | e: 2. | | |
| Course level: II | | | | | |
| Prerequisities: | | | | | |
| Conditions for | course completi | on: | | | |
| Learning outco | omes: | | | | |
| Brief outline of | the course: | | | | |
| Recommended | literature: | | | | |
| Course languag | ge: | | | | |
| Notes: | | | | | |
| Course assessment Total number of assessed students: 10 | | | | | |
| А | В | С | D | Е | FX |
| 50.0 20.0 10.0 0.0 10.0 10.0 | | | | | |
| Provides: doc. PhDr. Pavol Tholt, PhD., mim. prof. | | | | | |
| Date of last mo | dification: 03.05 | 5.2015 | | | |
| Approved: prof | Approved: prof. RNDr. Michal Jaščur, CSc. | | | | |

| University: P. J. Šafá | rik University in Košice | | | | | | |
|---|--|--|--|--|--|--|--|
| Faculty: Faculty of Science | | | | | | | |
| Course ID: ÚINF/ KKV1/15 | Course name: Classical and quantum computations | | | | | | |
| Course type, scope a Course type: Lectur Recommended cour Per week: 3 / 1 Per Course method: pre | nd the method: e / Practice rse-load (hours): study period: 42 / 14 esent | | | | | | |
| Number of ECTS cro | edits: 6 | | | | | | |
| Recommended seme | ster/trimester of the course: 1., 3. | | | | | | |
| Course level: II. | | | | | | | |
| Prerequisities: | | | | | | | |
| Conditions for cours Written work Writen and oral exam | e completion: | | | | | | |
| Learning outcomes: To provide informati and quantum models | on on quantum computer and quantum computations. To compare classical and methods. | | | | | | |
| Brief outline of the c The basics of class algorithms, probabili an algorithm. Introd superoperators), univ factoring algorithm, a quantum analogue of | ourse: ical theory of computation: Turing machines, Boolean circuits, parallel stic computation, NP-complete problems, and the idea of complexity of uction of general quantum formalism (pure states, density matrices, and versal gate sets and approximation theorems. Grover's algorithm, Shor's and the Abelian hidden subgroup problem. Parallel quantum computation, a NP-completeness, and quantum error-correcting codes. | | | | | | |
| Recommended litera 1. BERMAN,G.P., D Quantum Computers. 2. GRUSKA, J. Quan 3. JOHNSON, G. A S 4. KITAEV, A.Y., SH Mathematical Society 5. NIELSEN, M.A., O Cambridge University 6. HIRVENSALO, M | ture: OOLEN,G.D., MAINIERI, R., TSIFRINOVIC, V.I. Introduction to World Scientific, 2003. Itum Computing. McGraw-Hill, 1999. Shortcut Through Time: The Path to the Quantum Computer, Knopf 2003. EN, A.H., VYALYI, M.N. Classical and Quantum Computation. American 7, 2002. CHUANG, I.L. Quantum Computation and Quantum Information. y Press, 2000. I., Quantum Computing, Springer 2004 | | | | | | |
| Course language: | | | | | | | |
| Notes: | | | | | | | |

| Course assessment Total number of assessed students: 136 | | | | | | |
|---|-------|-------|------|------|------|--|
| ABCDEFX | | | | | | |
| 25.0 | 35.29 | 13.97 | 12.5 | 6.62 | 6.62 | |
| Provides: prof. RNDr. Gabriel Semanišin, PhD., RNDr. Zuzana Bednárová, PhD. | | | | | | |
| Date of last modification: 03.05.2015 | | | | | | |
| Approved: prof. RNDr. Michal Jaščur, CSc. | | | | | | |

| University: P. J. Šafá | rik Univers | ity in Košice | | | |
|---|----------------------------|------------------------|---|--|--|
| Faculty: Faculty of S | cience | | | | |
| Course ID: KPPaPZ/KK/07 | Course ID: KPPaPZ/KK/07 | | | | |
| Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 2 Per study period: 28 Course method: present | | | | | |
| Number of ECTS cr | edits: 2 | | | | |
| Recommended seme | ster/trimes | ster of the course: 3. | | | |
| Course level: II. | | | | | |
| Prerequisities: | | | | | |
| Conditions for cours | e completi | on: | | | |
| Learning outcomes: | | | | | |
| Brief outline of the c | ourse: | | | | |
| Recommended litera | iture: | | | | |
| Course language: | | | | | |
| Notes: | | | | | |
| Course assessment Total number of assessed students: 281 | | | | | |
| abs | | n | Z | | |
| 98.22 1.78 0.0 | | | | | |
| Provides: Mgr. Ondrej Kalina, PhD., Mgr. Lucia Barbierik, PhD. | | | | | |
| Date of last modification: 16.02.2021 | | | | | |
| Approved: prof. RNI | Dr. Michal J | Jaščur, CSc. | | | |

| University: P. J. Šafárik University in Košice | | | | | | | | |
|---|---|--|---|--|--|--|--|--|
| Faculty: Faculty o | f Science | | | | | | | |
| Course ID: ÚFV/ POF1b/99 | Course name: Computational Physics II | | | | | | | |
| Course type, scope and the method: Course type: Lecture / Practice Recommended course-load (hours): Per week: 2 / 1 Per study period: 28 / 14 Course method: present | | | | | | | | |
| Number of ECTS | credits: 4 | | | | | | | |
| Recommended ser | mester/trimes | ter of the cours | e: 1. | | | | | |
| Course level: I., II | • | | | | | | | |
| Prerequisities: | | | | | | | | |
| Conditions for con Continuous evalua Examination and a | urse completion tion is based consignments su | on: on students' activ bmitted electron | ity in the classro ically with the a | oom and work on ttached computer | assignments. code. | | | |
| Learning outcome To teach students t | e s: to create simul | ation projects to | help to solve ph | ysical problems. | | | | |
| Advanced method perturbation algori histogram methods and calculation of stochastic process molecular dynamic | s of Monte Ca ithms. Errors a s. Universality f critical expo es. Diffusion cs method. | arlo (MC) simul and histogram an and finite-size sc nents. Basics of equation. Stoch | ations of lattice nalysis of MC d caling. Determin quantum MC astic processes | spin systems. Lo lata. Reweighting ation of order of p simulations. MC in financial anal | bcal and cluster by simple and hase transitions simulations of ysis. Basics of | | | |
| Recommended literature: 1. D.P. Landau, K. Binder: A Guide to Monte Carlo Simulations in Statistical Physics, Cambridge University Press, 2000. 2. B.A. Berg: Introduction to Markov Chain Monte Carlo Simulations and Their Statistical Analysis, http://www.worldscibooks.com/etextbook/5904/5904_intro.pdf 3. W. Janke: Lectures on Ising model, http://www.physik.uni- leipzig.de/~janke/Ising Lectures Lviv.html | | | | | | | | |
| Course language: | | | | | | | | |
| Notes: | | | | | | | | |
| Course assessment Total number of assessed students: 53 | | | | | | | | |
| A | В | С | D | Е | FX | | | |
| 52.83 | 16.98 | 16.98 | 9.43 | 1.89 | 1.89 | | | |
| Provides: prof. RN | IDr. Milan Žul | kovič, PhD. | | | | | | |
| Date of last modif | ication: 25.09 | .2017 | | | | | | |

| | ¥ | <u> </u> | | | | | |
|--|---|---|---|--|--|--|--|
| University: P. J | . Safárik Univers | sity in Košice | | | | | |
| Faculty: Facult | y of Science | | | | | | |
| Course ID: ÚF PAST/17 | V/ Course na | ame: Computer a | strophysics | | | | |
| Course type, sc Course type: 1 Recommender Per week: 2/2 Course metho | cope and the me Lecture / Practice d course-load (h 2 Per study peri d: present | thod: e iours): iod: 28 / 28 | | | | | |
| Number of EC | TS credits: 5 | | | | | | |
| Recommended | semester/trime | ster of the cours | e: 2. | | | | |
| Course level: II | - | | | | | | |
| Prerequisities: | | | | | | | |
| Conditions for Software project | course complet et | ion: | | | | | |
| Learning outco Inform students in astronomy and and basic work | omes: of astronomy as nd astrophysics, with astronomic | well as other inter give them basic in al packages | rested people ab nformations abo | oout basic numeric out problems of so | cal methods used cientific writting | | |
| Brief outline of Introduction to ADS Abstract photometry Int stellar time, a motion. Helioc astronomical da determinations. | the course: LaTex system., Service. FITS for roduction to M ir mass, reduct entric and baryo ta. Transformati | Sources of astro ormat of astronom IIDAS and IRA tion of precession centric correction on of photometric | nomical inform nical data. Red F. Numerical j on, nutation, a of time and v systems and ca | nations on web, v uction of CCD as procedures for J beration, refractivelocity. Period c libration of spectr | VIZIER, NASA nd photoelectric D computation, ion and proper determination in ra. Minima times | | |
| Recommended 1. Ghedini: 198 2. Press et al., 1 3. manual for se | literature: 2, Software for 1 992, Numerical | Photometric astro Recipes in C, The s 4. published pap | nomy e art of scientifi pers and interne | c Computing, CU t sources | JΡ | | |
| Course languag Slovak, English | ge: | | | | | | |
| Notes: | | | | | | | |
| Course assessm Total number o | Course assessment Total number of assessed students: 5 | | | | | | |
| А | В | C | D | Е | FX | | |
| 100.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Provides: doc.] | Mgr. Štefan Pari | mucha, PhD. | | <u> </u> | <u>ı</u> | | |
| Date of last mo | Date of last modification: 02.04.2020 | | | | | | |
| | | | | | | | |

| University: P. J | . Šafárik Univers | ity in Košice | | | | |
|--|---|-------------------|------------------|---|----|--|
| Faculty: Facult | y of Science | | | | | |
| Course ID: ÚF STFTL/19 | 7/ Course name: Contemporary Topics in Solid State: Computational Physics Applications | | | | | |
| Course type, scope and the method: Course type: Lecture / Practice Recommended course-load (hours): Per week: 2 / 1 Per study period: 28 / 14 Course method: present | | | | | | |
| Number of EC | I'S credits: 5 | | | | | |
| Recommended | semester/trimes | ster of the cours | e: 1., 3. | | | |
| Course level: II | | | | | | |
| Prerequisities: | | | | | | |
| Conditions for | course completi | on: | | | | |
| Learning outco | omes: | | | | | |
| Brief outline of | the course: | | | | | |
| Recommended | literature: | | | | | |
| Course languag | ge: | | | | | |
| Notes: | | | | | | |
| Course assessm Total number o | Course assessment Total number of assessed students: 1 | | | | | |
| А | В | С | D | Е | FX | |
| 100.0 0.0 0.0 0.0 0.0 | | | | | | |
| Provides: RNDr. Martin Gmitra, PhD. | | | | | | |
| Date of last modification: | | | | | | |
| Approved: prof. RNDr. Michal Jaščur, CSc. | | | | | | |

| University: P. J. Šafárik University in Košice | | | | | | | |
|--|---|--|--|--|---|--|--|
| Faculty: Faculty of Science | | | | | | | |
| Course ID: ÚF KOZM/13 | : ÚFV/ Course name: Cosmology | | | | | | |
| Course type, scope and the method: Course type: Lecture Recommended course-load (hours): Per week: 2 Per study period: 28 Course method: present | | | | | | | |
| Number of EC | FS credits: 4 | | | | | | |
| Recommended | semester/trime | ster of the cours | e: 3. | | | | |
| Course level: II | • | | | | | | |
| Prerequisities: | | | | | | | |
| Conditions for Test within the Oral exam with | course completi curriculum prese preparation; 3 q | ion: ented during the c uestions within the | course; seminar he curriculum p | essay. resented during t | he course. | | |
| Learning outco Become acquai evolution of the | mes: nted with basic universe. | knowledge of fu | undamental cos | mological theorie | es, structure and | | |
| Brief outline of Structure and of theories; Olber cosmology; oth problems. | the course: distribution of m rs' paradox; gra er cosmological | natter in the un avitational parace theories. The or | iverse. Historic lox. General igin and evolut | al development theory of relati ion of the univers | of cosmological vity; relativistic se; cosmological | | |
| Recommended 1. Contopoulos 1984; 2. Weinberg, S. 3. Narlikar, J.V. | literature: , D. Kotsakis, Co , Gravitation and , An Introduction | osmology, the stru Cosmology, Wil n to Cosmology, | ucture and evolution of the second seco | ution of the Unive 1971; versity Press, Car | erse, Springer, mbridge, 2002; | | |
| Course languag Slovak, English | ge: | | | | | | |
| Notes: | | | | | | | |
| Course assessm Total number of | Course assessment Total number of assessed students: 27 | | | | | | |
| А | В | С | D | Е | FX | | |
| 77.78 | 77.78 18.52 3.7 0.0 0.0 0.0 | | | | | | |
| Provides: doc. 1 | RNDr. Rudolf Ga | ális, PhD., RNDr | . Marián Jurčiši | n, PhD. | <u>.</u> | | |
| Date of last modification: 26.09.2017 | | | | | | | |
| Approved: prof. RNDr. Michal Jaščur, CSc. | | | | | | | |
| L | | | | | | | |

| University: P. J | . Šafárik Univers | ity in Košice | | | | | |
|---|---|-------------------|----|---|----|--|--|
| Faculty: Facult | Faculty: Faculty of Science | | | | | | |
| Course ID: ÚF DPO/14 | V/ Course name: Diploma Thesis and its Defence | | | | | | |
| Course type, sc Course type: Recommended Per week: Per Course metho | cope and the met d course-load (h r study period: d: present | thod: ours): | | | | | |
| Number of EC | IS credits: 20 | | | | | | |
| Recommended | semester/trimes | ster of the cours | e: | | | | |
| Course level: II | | | | | | | |
| Prerequisities: | | | | | | | |
| Conditions for | course completi | on: | | | | | |
| Learning outco | omes: | | | | | | |
| Brief outline of | the course: | | | | | | |
| Recommended | literature: | | | | | | |
| Course languag | ge: | | | | | | |
| Notes: | | | | | | | |
| Course assessm Total number of | Course assessment Total number of assessed students: 53 | | | | | | |
| А | В | С | D | Е | FX | | |
| 66.04 22.64 7.55 1.89 1.89 0.0 | | | | | | | |
| Provides: | | | | | | | |
| Date of last modification: 03.05.2015 | | | | | | | |
| Approved: prof. RNDr. Michal Jaščur, CSc. | | | | | | | |

| University: P. J. Šafá | rik University in Košice |
|--|---|
| Faculty: Faculty of S | cience |
| Course ID: ÚFV/ EKF/04 | Course name: Econophysics |
| Course type, scope a Course type: Lectur Recommended cour Per week: 2 / 1 Per Course method: pre | nd the method: re / Practice rse-load (hours): study period: 28 / 14 esent |
| Number of ECTS cr | edits: 4 |
| Recommended seme | ster/trimester of the course: 3. |
| Course level: II. | |
| Prerequisities: | |
| Conditions for cours Continuous evaluatio Examination | e completion: n is based on students' activity in the classroom and work on assignments. |
| Learning outcomes: To teach student to e economy and sociolo | employ the aquired knowledge from physics in different disciplines such as gy. |
| Brief outline of the c Introduction. Pareto models of social and logarithmic price, th processess and distrib of distribution funct via computer. Select intermittence. Correl Autocorrelations and of enterprises and for processes with variab Black-Scholes model | ourse: and Bachelier approach. The physical "philosophy" in the formulation of d economic models. The system of measurable quantities in economy, the ne uints of time and price in economy. The stochastic models, random bution functions, stability of distributions, infinitely divisible process, scaling ions, Gauss and Lévy distribution, the simulation of random processes ed parallels between economy and fluid turbulence, market volatility and ations of markets, the markets in mutual correlations and anticorrelations. analysis of time series. Portfolio taxonomy and the strategy of the joining mation of corporations. Computer modeling of GARCH and ARCH random le dispersion of volatility. Models based on the stochastic diferential equations, of the rational option price. |
| Recommended litera 1. An Introduction to E. Stanley, Cambridg 2. The Statistical Mee 3. Econophysics: An Chakrabarti, Wiley V | ture: Econophysics: Correlations and Complexity in Finance, R. N. Mantegna, H. e University Press 2000. chanics of Financial Markets, J. Voit, Springer 2003. Introduction, Sitabhra Sinha, A. Chatterjee, A. Chakraborti, B. K. CH 2011. |
| Course language: | |
| Notes: | |

| Course assessment Total number of assessed students: 16 | | | | | | | |
|--|----------------|-------------|-----|-----|-----|--|--|
| A B C D E FX | | | | | | | |
| 75.0 | 18.75 | 6.25 | 0.0 | 0.0 | 0.0 | | |
| Provides: prof. | RNDr. Milan Žu | kovič, PhD. | | | | | |
| Date of last modification: 25.09.2017 | | | | | | | |
| Approved: prof. RNDr. Michal Jaščur, CSc. | | | | | | | |

| University: P. J. Šafárik University in Košice | | | | | | | |
|--|---|-----------------------------------|---------------------------------------|--------------------|--------------------------|--|--|
| Faculty: Faculty of Science | | | | | | | |
| Course ID: ÚF ESP1/13 | V/ Course name: Extrasolar Planets | | | | | | |
| Course type, scope and the method: Course type: Lecture Recommended course-load (hours): Per week: 2 Per study period: 28 Course method: present | | | | | | | |
| Number of EC | FS credits: 3 | | | | | | |
| Recommended | semester/trimes | ster of the cours | e: 3. | | | | |
| Course level: II | | | | | | | |
| Prerequisities: | | | | | | | |
| Conditions for semestral essay oral exam | course completi | on: | | | | | |
| Learning outco Acquaint studer | mes: nts wit problema | tic of exoplanets, | their detections, | formation and p | roperties. | | |
| Brief outline of Definition of p disks and forma | the course: lanets and exopl tions of planets, | anets, known ex creation of giant | oplanets, methoo planets and their | ds of their detect | tion, protostelar stems. | | |
| Recommended 1. Barnes, R.:20 2. Cassen et al:2 3. Haswell C. A 4. Lena et al.: 2 5. Mason, J.: 20 6. Perryman, M | Recommended literature: 1. Barnes, R.:2010, Formation and Evolution of Exoplanets, Wiley-VCH 2. Cassen et al:2006, Extrasolar planets, Springer 3. Haswell C. A.: 2010, Transiting exoplanets, Cambridge University Press 4. Lena et al.: 2011, Observational Astrophysics, Springer-Verlag 5. Mason, J.: 2008, Exoplanets: Detection, Formation, Properties, Habitability, Springer | | | | | | |
| Course languag Slovak, English | ge: | | | | | | |
| Notes: | | | | | | | |
| Course assessm Total number of | ent f assessed studen | ts: 13 | | | | | |
| А | В | С | D | Е | FX | | |
| 76.92 | 23.08 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Provides: doc. 1 | Provides: doc. Mgr. Štefan Parimucha, PhD. | | | | | | |
| Date of last modification: 27.09.2016 | | | | | | | |
| Approved: prof | Approved: prof. RNDr. Michal Jaščur, CSc. | | | | | | |

| University: P. J. Šafárik University in Košice | | | | | | | |
|--|--|--|---|---|--|--|--|
| Faculty: Faculty of Science | | | | | | | |
| Course ID: ÚF GEA1/13 | ÚFV/ Course name: Galactic and Extragalactic Astronomy | | | | | | |
| Course type, scope and the method: Course type: Lecture Recommended course-load (hours): Per week: 3 Per study period: 42 Course method: present | | | | | | | |
| Number of EC | FS credits: 5 | | | | | | |
| Recommended | semester/trime | ster of the cours | e: 2. | | | | |
| Course level: II | • | | | | | | |
| Prerequisities: | ÚFV/TAF1/13 | | | | | | |
| Conditions for Test | course complet | ion: | | | | | |
| Learning outco Acquaint studen neighborhood, o | mes: nts with the stru division of galax | cture of our Gala | axy, stellar strear c and evolution. | ns and stellar st | atistics, galactic | | |
| Brief outline of Determination neighbouhood. populations of galaxies, cluster | the course: of distances of Movement os the the stars and spires of galaxies. Ev | f the universe. e Sun in space. Sternal structure. Ga volution of galaxi | Movement of the elar statistics. Strue laxies in universe es and large scale | he stars in Ga acture of the Gala e, classification. e structure | laxy and Solar axy, subsystems, Local group of | | |
| Recommended 1. Bertin a Lin: 2. Combes et al 3. Harwitt: 1998 4. Mihalas: 196 | literature: 1996, Spiral Str .: 2003, Galaxie: 8, Astrophysical 8, Galactic Astro | ucture in Galaxie s and Cosmology Concepts, Spring pnomy, Freeman | s, The MIT Press , Springer, Berlin ger, Berlin Publishing | 3. I | | | |
| Course languag Slovak, English | ge: | | | | | | |
| Notes: | | | | | | | |
| Course assessm Total number of | ent f assessed studer | nts: 13 | | | | | |
| А | В | С | D | Е | FX | | |
| 76.92 | 76.92 15.38 7.69 0.0 0.0 0.0 | | | | | | |
| Provides: doc. N | Mgr. Štefan Pari | nucha, PhD. | | | | | |
| Date of last modification: 02.04.2020 | | | | | | | |
| Approved: prof. RNDr. Michal Jaščur, CSc. | | | | | | | |

| University: P. J. Šafárik University in Košice | | | | | | | |
|---|---|---|--|---|---|--|--|
| Faculty: Faculty of Science | | | | | | | |
| Course ID: ÚFV TRV1/00 | // Course na | me: General Th | eory of Relativi | ty | | | |
| Course type, scope and the method: Course type: Lecture Recommended course-load (hours): Per week: 2 Per study period: 28 Course method: present | | | | | | | |
| Number of ECT | 'S credits: 3 | | | | | | |
| Recommended s | semester/trimes | ster of the cours | e: 2. | | | | |
| Course level: II. | | | | | | | |
| Prerequisities: | | | | | | | |
| Conditions for c Continuous elab exam five rando will be discusses | ourse completi oration of home m homework pr a. Base on the ar | on: work during the oblems are selec swers final mark | semester. Durin ted and their ph c will be given. | g the oral ysical content | | | |
| Learning outcor | nes: | | | | | | |
| Overview of th Local principle Einstein equatio Experimental tes isotropic distribu | e special theor of equivalence ns of gravitation ats of the genera ation of mass. C | y of relativity (- Eotvos experim nal field. Schwar l theory of relativ osmological appl | (STR). Uniform nent. Tensor cal rzschild's soluti vity. Black holes lications. | nly accelerated n culus in pseudori on for spherically s. Solutions for ho | notion in STR. emann's metric. y symetric field. mogeneous and | | |
| Recommended literature: 1. Hughston, L. P., Tod K. P.: An Introduction to General Relativity, London Mathematical Society Student Texts 5. CUP, Cambridge, 1990. 2. Wald, R.W.: General Relativity, University of Chicago Press, Chicago, 1984. 3. Misner, C.W., Thorne, K.S., Wheller, J.A.: Gravitation, Freeman, San Francisco, 1973. 4. Landau L.D., Lifshitz E.M.: The classical theory of fields. Addison- Wesley, Reading, Mass., USA, 1977. | | | | | | | |
| Course language: 1. Slovak, 2. English | | | | | | | |
| Notes: | | | | | | | |
| Course assessment Total number of assessed students: 94 | | | | | | | |
| A | В | С | D | E | FX | | |
| 87.23 | 6.38 | 6.38 | 0.0 | 0.0 | 0.0 | | |
| Provides: RNDr. Tomáš Lučivjanský, PhD. | | | | | | | |

Date of last modification: 27.03.2020

| University: P. J | University: P. J. Šafárik University in Košice | | | | | | |
|--|--|---|----|---|----|--|--|
| Faculty: Facult | Faculty: Faculty of Science | | | | | | |
| Course ID: KF/ DF2p/03 | Course na | Course name: History of Philosophy 2 (General Introduction) | | | | | |
| Course type, scope and the method: Course type: Lecture / Practice Recommended course-load (hours): Per week: 2 / 1 Per study period: 28 / 14 Course method: present | | | | | | | |
| Number of EC | TS credits: 4 | | | | | | |
| Recommended | semester/trimes | ster of the cours | e: | | | | |
| Course level: I. | , II. | | | | | | |
| Prerequisities: | | | | | | | |
| Conditions for | course completi | on: | | | | | |
| Learning outco | omes: | | | | | | |
| Brief outline of | the course: | | | | | | |
| Recommended | literature: | | | | | | |
| Course languag | ge: | | | | | | |
| Notes: | | | | | | | |
| Course assessm Total number of | Course assessment Total number of assessed students: 739 | | | | | | |
| А | В | С | D | Е | FX | | |
| 60.89 13.8 12.58 8.66 3.38 0.68 | | | | | | | |
| Provides: Doc. PhDr. Peter Nezník, CSc. | | | | | | | |
| Date of last modification: 25.03.2020 | | | | | | | |
| Approved: prof. RNDr. Michal Jaščur, CSc. | | | | | | | |

| University: P. J. Šafárik University in Košice | | | | | | | |
|---|--|--|--------------|---|----|--|--|
| Faculty: Faculty | y of Science | | | | | | |
| Course ID: KF/ IH2/03 | Course na | Course name: Idea Humanitas 2 (General Introduction) | | | | | |
| Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 2 Per study period: 28 Course method: present | | | | | | | |
| Number of EC | FS credits: 2 | | | | | | |
| Recommended | semester/trimes | ster of the cours | e: 3. | | | | |
| Course level: II | - | | | | | | |
| Prerequisities: | | | | | | | |
| Conditions for | course completi | on: | | | | | |
| Learning outco | mes: | | | | | | |
| Brief outline of | the course: | | | | | | |
| Recommended | literature: | | | | | | |
| Course languag | ge: | | | | | | |
| Notes: | | | | | | | |
| Course assessm Total number of | Course assessment Total number of assessed students: 9 | | | | | | |
| А | В | С | D | Е | FX | | |
| 88.89 11.11 0.0 0.0 0.0 0.0 | | | | | | | |
| Provides: Doc. PhDr. Peter Nezník, CSc. | | | | | | | |
| Date of last modification: 12.02.2021 | | | | | | | |
| Approved: prof. RNDr. Michal Jaščur, CSc. | | | | | | | |

| University: P. J | . Šafárik Univers | sity in Košice | | | | | |
|--|---|---|-------------------------------------|--|---------------------------------------|--|--|
| Faculty: Facult | y of Science | | | | | | |
| Course ID: ÚF MPH1/13 | V/ Course n | Course name: Interpalnetary Matter | | | | | |
| Course type, scope and the method: Course type: Lecture Recommended course-load (hours): Per week: 4 Per study period: 56 Course method: present | | | | | | | |
| Number of EC | FS credits: 6 | | | | | | |
| Recommended | semester/trime | ster of the cours | e: 3. | | | | |
| Course level: II | • | | | | | | |
| Prerequisities: | | | | | | | |
| Conditions for test Exam | course complet | ion: | | | | | |
| Learning outco The knowledge | mes: on the physical | and dynamic prop | perties of asteroi | ids, comets and m | neteors. | | |
| Brief outline of Asteroids, com- composition, co- context. | the course: ets, meteors - di ollision with Ea | scoveries, orbits, orth, formation a | astrometry, pho nd evolution, sp | tometry, mass, ro pace research, re | otation and size, elationships and | | |
| Recommended literature: J.S. Lewis: Physics and Chemistry of the Solar System, London, Academic Press, 1997 (kapitoly VI, VII, VIII). Bottke, W.F., Cellino, A., Paolicchi, P., Binzel, R.P.: Asteroids III, Tucson, University of Arizona Press, 2002. Brandt, J.C., Chapman, D.: Introduction to comets, Cambridge, Cambridge University Press, 2004. Murad, E., Williams I.P.: Meteors in the Earth's Atmosphere, Cambridge, Cambridge University Press, 2002 | | | | | | | |
| Course languag Slovak, English | ge: | | | | | | |
| Notes: | | | | | | | |
| Course assessment Total number of assessed students: 14 | | | | | | | |
| А | В | C | D | Е | FX | | |
| 71.43 | 71.43 14.29 14.29 0.0 0.0 0.0 | | | | | | |
| Provides: doc. 1 | RNDr. Ján Svore | nň, DrSc. | | | | | |
| Date of last mo | Date of last modification: 03.05.2015 | | | | | | |
| | | | | | | | |

| University: P. J. Šafárik University in Košice | | | | | | |
|---|------------------------------|--------------------------------|-------------------|--------------------|-----------------|--|
| Faculty: Faculty of Science | | | | | | |
| Course ID: ÚINF/ UNS1/15 | Course na | me: Introductio | n to neural netwo | orks | | |
| Course type, scope and the method: Course type: Lecture / Practice Recommended course-load (hours): Per week: 2 / 2 Per study period: 28 / 28 Course method: present | | | | | | |
| Number of ECTS of | credits: 5 | | | | | |
| Recommended sem | ester/trimes | ster of the cours | se: 1. | | | |
| Course level: I., II. | | | | | | |
| Prerequisities: | | | | | | |
| Conditions for course completion: Evaluation of projects created for neural network applications. Written and oral exam. | | | | | | |
| Learning outcomes To understand and with software for ne | to know appl to know appl | ications of basic c models. | paradigms of ne | eural networks. To | o learn working | |
| Brief outline of the course: Basic models of computational units - neurons (linear threshold gates, polynomial threshold gates, perceptrons), their computational capability, algorithms of adaptations. Feed-forward neural networks, back propagation algorithm. Hopfield neural networks. ART neural networks. Using neural networks to solving of problems. Genetic and evolution algorithms. | | | | | | |
| Recommended literature: J. Hertz, A.Krogh, R.G. Palmer: Introduction to the theory of neural computation, Addison Wesley, 1991 HASSOUN, M. H.: Fundamentals of artificial neural networks, The MIT Press, 1995. Mitchell, M. (1998). An introduction to genetic algorithms. MIT press. | | | | | | |
| Course language: Slovak or English | | | | | | |
| Notes: Content prerequisites: Basics of programming in Python, or another alternative programming language suitable for data analysis | | | | | | |
| Course assessment Total number of assessed students: 439 | | | | | | |
| A | В | С | D | Е | FX | |
| 14.12 | 17.08 | 22.55 | 19.13 | 22.78 | 4.33 | |
| Provides: RNDr. Ľu | ıbomír Antoı | ni, PhD. | | | | |

Date of last modification: 10.02.2021

| University: P. J. | Šafárik Univers | sity in Košice | | | | |
|--|--|---|--|--|---|--|
| Faculty: Faculty | v of Science | | | | | |
| Course ID: ÚF FNT1/03 | V/ Course na | Course name: Low Temperature Physics | | | | |
| Course type, sc Course type: 1 Recommended Per week: 4 Pe Course metho | ope and the me Lecture d course-load (h er study period d: present | thod: nours): : 56 | | | | |
| Number of EC | FS credits: 6 | | | | | |
| Recommended | semester/trime | ster of the cours | e: 1. | | | |
| Course level: II | • | | | | | |
| Prerequisities: | | | | | | |
| Conditions for course completion: Two tests during the semester. Final examination consists of the results of two tests and oral exam. The oral exam may be waived of if the tests results are better then D. | | | | | | |
| Learning outco The cours give information on | mes: s knowledge of basic physical p | methods and to coperties of cond | echniques used ensed matter at l | in low-temperatures. | are physics and | |
| Brief outline of Phase diagram Two-fluid mod helium-4. Quar solutions. Quar of superconduc Macroscopic qu Reaching low physics. | the course: of 4He. Therr lel for superflu- ntize vortices. P ntum crystals. Su tivity. Transport antum effects ar and very low t | nal and transpo- id He II. Hydro hase diagram of uperconductivity. properties (elect id mesoscopic sy emperatures. Th | rt propertie sof odynamics and 3He. Order pa Tunnel superce rical and therma stems. Specific h ermometry. Ne | Iliquid helium-4 thermodynamics trameter. Propertion onducting junction al) of solids at low the the the the the the the meat of solids at low the the the the the the the the the the the the the the the the the the the | r. Superfluidity. for superfluid ies of 3He-4He ons. Application w temperatures. ow temperatures. low-temperature | |
| Recommended A. Kent: Experi D. S. Betts: An P. V. E. McClin F. Pöbell: Matte | literature: imental low-tem introduction to I tok et al.: Low-T er an Methods at | perature physics. Milikelvin Techn Temperature Phys Low Temperatur | Mac Millan Pre ology. Cambridg sics. Blackie, Ga res. Springer - V | ss Ltd., 1993. ge University Pres Isgow and Londo erlag, Berlin, 199 | ss, 1989. m 1992. 2 | |
| Course languag | ge: | | | | | |
| Notes: | | | | | | |
| Course assessm Total number of | ent f assessed studer | nts: 62 | | | | |
| А | В | С | D | Е | FX | |
| 91.94 | 3.23 | 4.84 | 0.0 | 0.0 | 0.0 | |
| Provides: doc. 1 | RNDr. Erik Čižn | nár, PhD., Dr.h.c. | prof. RNDr. Al | exander Feher, Di | rSc. | |

Date of last modification: 03.05.2015

| University: | University: P. J. Šafárik University in Košice | | | | | | |
|--|--|--|--------------|-------|------|------|-------|
| Faculty: Faculty of Science | | | | | | | |
| Course ID: MKL/03 | ÚFV/ C | Course name: Magnetic Properties of Solids | | | | | |
| Course type, scope and the method: Course type: Lecture Recommended course-load (hours): Per week: 4 Per study period: 56 Course method: present | | | | | | | |
| Number of ECTS credits: 6 | | | | | | | |
| Recommen | ded semeste | er/trimester | of the cours | e: 2. | | | |
| Course leve | el: II., III. | | | | | | |
| Prerequisit | ies: | | | | | | |
| Conditions for course completion: Elaboration of written texts. Distance oral exam. | | | | | | | |
| Learning outcomes: To obtain a general view on basic magnetic phenomena, intrinsic magnetic properties of various magnetic materials, magnetization processes and domain structure. | | | | | | | |
| Brief outline of the course: Magnetic materials and magnetization. Magnetic quantities. Carriers of magnetic moment. Vector model of the atom. Magnetic field sources. Measurements of magnetic field. Diamagnetism. Paramagnetism. Ferromagnetism. Antiferromagnetism. Ferrimagnetism. Mgnetic behavior and structure of materials. Neutron diffraction. Magnetic anisotropy. Hall effect, magnetoresistance. Domain structure. Magnetostriction. Technical magnetization. Dynamic magnetization processes. Susceptibility. Thin films. | | | | | | | |
| Recommended literature: S. Chikazumi: Physics of Magnetism, Oxford University Press 2009 D. Jiles: Introduction to magnetism and magnetic materials, Chapman&Hall, London, New York, Tokyo, Melbourne, Madras, 1991 | | | | | | | |
| Course language: english | | | | | | | |
| Notes: | | | | | | | |
| Course assessment Total number of assessed students: 108 | | | | | | | |
| А | В | C | D | Е | FX | Ν | Р |
| 39.81 | 16.67 | 10.19 | 2.78 | 1.85 | 1.85 | 0.93 | 25.93 |
| Provides: prof. RNDr. Peter Kollár, DrSc. | | | | | | | |
| Date of last modification: 26.03.2020 | | | | | | | |
| | | | | | | | |
| University: P. J. Šafá | rik University in Košice |
|--|--|
| Faculty: Faculty of S | cience |
| Course ID: ÚMV/ MPA/19 | Course name: Markov's processes and their applications |
| Course type, scope a Course type: Lectur Recommended cour Per week: 3 / 2 Per Course method: pre | nd the method: re / Practice rse-load (hours): study period: 42 / 28 esent |

Number of ECTS credits: 6

Recommended semester/trimester of the course: 1.

Course level: II.

Prerequisities:

Conditions for course completion:

To obtain at least 50% in written tests during the semester. Total evaluation based on written tests and oral exam.

Learning outcomes:

Student should obtain the knowledge about modelling of stochastic processes and the ability to apply theoretical knowledge in practical problems solving.

Brief outline of the course:

Stochastic (random) processes, their distributions and characteristics. Trajectory of the process. Classification of processes -homogenous,ergodic and stacionary process. Markov chains with discrete time, classification of states of the process. Evaluation of transitions, optimal strategies, Howard's algorithm. Markov chains with continuous time, intensity of transition. Kolmogorov's differential equations, methods of solutions. Poisson process. Birth-and-death processes. General linear process. Applications in queuing theory. Kendall's classification of queuing systems, opened and closed systems, systems with waiting. Applications in renewal theory and reliability. Markov chains in discrete renewal models. Renewal process with continuous time. Limit theorems of renewal theory.

Recommended literature:

- 1. Skřivánková V.: Náhodné procesy a ich aplikácie, UPJŠ, Košice, 2004 (in Slovak)
- 2. Beichelt F.: Applied Probability and Stochastic Processes, 2nd Ed., Chapman and Hall, 2016
- 3. Ross S. M.: Introduction to Probability Models, 10th ed., Academic Press, 2009
- 4. Janková, K. a kol. Markovove reťazce a ich aplikácie, epos, 2014 (in Slovak)
- 5. Prášková Z., Lachout P.: Základy náhodných procesu, MFF UK, Praha, 1998 (in Czech)

Course language:

Slovak

Notes:

| Course assessment Total number of assessed students: 59 | | | | | |
|--|--|-------|-------|-------|------|
| ABCDEFX | | | | | FX |
| 18.64 | 13.56 | 20.34 | 25.42 | 18.64 | 3.39 |
| Provides: RND | Provides: RNDr. Martina Hančová, PhD., RNDr. Andrej Gajdoš, PhD. | | | | |
| Date of last modification: 18.03.2019 | | | | | |
| Approved: prof. RNDr. Michal Jaščur, CSc. | | | | | |

| | COURSE INFORMATION LETTER | | | | | |
|---|---|--|--|--|--|--|
| University: P. J. Šafá | rik University in Košice | | | | | |
| Faculty: Faculty of S | cience | | | | | |
| Course ID: ÚFV/ NSF/10 | Course name: Non-Equilibrium Statistical Physics | | | | | |
| Course type, scope a Course type: Lectur Recommended cour Per week: 2 / 1 Per Course method: pre | Course type, scope and the method: Course type: Lecture / Practice Recommended course-load (hours): Per week: 2 / 1 Per study period: 28 / 14 Course method: present | | | | | |
| Number of ECTS cr | edits: 5 | | | | | |
| Recommended seme | ster/trimester of the course: 3. | | | | | |
| Course level: II. | | | | | | |
| Prerequisities: | | | | | | |
| Conditions for cours | e completion: | | | | | |
| Learning outcomes: To give basic knowl equlibrium phenomer | edges about modern trends and theoretical methods in description of non- na in physics. | | | | | |
| Brief outline of the c Problems of kinetic t Liouville operator. phenomena. Conserv leading approximatio and temperature. De equation. Derivation laws. Reynolds numb N-particle distributio Principle of weakeni Brown motion. Lange | ourse: heory - formulations of basic tasks. Distribution function. Liouville theorem. Kinetic Boltzman equation. H-theorem. Maxwell distribution. Transport ation laws. Derivation of the macroscopic eduqtions in leading and next-to- n. Hydrodynamic approximation. Set of equations for density, mean velocity rivation of continuity equation, Navier-Stokes equation, heat conductivity of vicosity and diffusivity coefficients from microscopic description. Stokes ber. Dynamical derivation of kinetic equation. Liouville (master) equation for n function. Bogolyubov set of equations for distribution functions. ng of statistical correlations. Equation for one-particle distribution function. evin equation. Fokker-Planck equation and specific tasks. | | | | | |
| Recommended litera 1. Landau L.D., Lifsh Fizicheskaja kinetika, Moskva, Fiz 2. K. Huang: Statistic D.N.Zubarev: Neravi A.N.Vasiliev Kvanto dinamike, Sankt-Pete Renormalization Gro CRS Press Company | nture: nitz E.M.: Teoreticheskaja fizika X: Lifshitz E.M., Pitaevskij L.P.: zmatlit 2002 cal mechanics, John Wiley and Sons, Inc., New York-London, 1963. novesnaja statisticheskaja termodinamika, Moskva, Nauka, 1971. vopolevaja renormgruppa v teorii kriticeskogo povedenija i stochasticeskoj erburg, Izd. Peters. Inst. Of. Nuclear physics (1998) 773 (The Field Theoretic up in Critical Behavior Theory and Stochastic Dynamics, Chapman & Hall New York, 2004) | | | | | |
| Course language: slovak and english | | | | | | |
| Notes: | | | | | | |

| Course assessment Total number of assessed students: 22 | | | | | |
|---|------|-------|------|-----|-----|
| A B C D E FX | | | | FX | |
| 68.18 | 9.09 | 13.64 | 9.09 | 0.0 | 0.0 |
| Provides: prof. RNDr. Michal Hnatič, DrSc., RNDr. Tomáš Lučivjanský, PhD. | | | | | |
| Date of last modification: 03.05.2015 | | | | | |
| Approved: prof. RNDr. Michal Jaščur, CSc. | | | | | |

| Universitas D. I. Čećaila Universitas in Vežice | | | | | |
|--|---|--|--|--|--|
| | | | | | |
| Faculty: Faculty of | Science | | | | |
| Course ID: ÚFV/ NOT1a/03 | Course name: Nontraditional Optimization Techniques I | | | | |
| Course type, scope and the method: Course type: Lecture / Practice Recommended course-load (hours): Per week: 2 / 2 Per study period: 28 / 28 Course method: present | | | | | |
| Number of ECTS credits: 5 | | | | | |
| Recommended semester/trimester of the course: 1. | | | | | |
| Course level: I., II. | | | | | |
| Prerequisities: | | | | | |

Conditions for course completion:

Monitoring progress in solving applied projects. examination (50%), quality of the project (50%) examination

Learning outcomes:

To familiarize students with biologically and physically inspired optimization, simulation and prediction techniques. To expand students' creativity and programming skills by applying heuristic techniques in solving applied problems.

Brief outline of the course:

Fundamentals of optimization theory. Basic optimization problems. Basic types of objective functions. Classification of optimization techniques. Gradient-based optimization techniques. Evolutionary algorithms. Genetic algorithms. Genetic algorithms as Markov processes. Statistical Mechanics Approximations of Genetic Algorithms. Monte Carlo simulation and simulated annealing. Swarm optimization. Cellular Automata and their applications in simulations of complex systems. Fractals. Agent-based models. Evolutionary games. Evolution of cooperation. Fundamentals of Neural Networks. Application of singular value decomposition to solve least squares problems.

Recommended literature:

Hartmann, A. K., Rieger, H., Optimization Algorithms in Physics, Wiley, 2002
Reeves, C. R., Rowe, J. E., Genetic Algorithms: Principles and perspectives, Kluwer, 2003
Mitchell, M., Complexity. A Guided Tour, Oxford University Press, 2009
Solé, R. V., Phase Transitions, Princeton University Press, 2011
Ilachinski, A., Cellular Automata. A Discrete universe, World Scientific, 2002
Haykin, S., Neural Networks. A Comprehensive Foundation, Prentice-Hall, 1999

Course language:

Notes:

| Course assessm Total number o | nent f assessed studen | ts: 81 | | | |
|---|---|--------|------|-----|-----|
| A B C D E FX | | | | FX | |
| 69.14 | 17.28 | 7.41 | 2.47 | 3.7 | 0.0 |
| Provides: doc.] | Provides: doc. RNDr. Jozef Uličný, CSc. | | | | |
| Date of last modification: 03.05.2015 | | | | | |
| Approved: prof. RNDr. Michal Jaščur, CSc. | | | | | |

| University: P. J. | Šafárik Univ | versity in Košice | | | | | |
|--|---|---|---|---|---|--|--|
| Faculty: Faculty | of Science | | | | | | |
| Course ID: ÚFV NOT1b/03 | V/ Cours | Course name: Nontraditional Optimization Techniques II | | | | | |
| Course type, sc Course type: L Recommended Per week: 2 / 2 Course method | ope and the Lecture / Prac l course-load 2 Per study p d: present | method: tice I (hours): period: 28 / 28 | | | | | |
| Number of EC | FS credits: 5 | | | | | | |
| Recommended | semester/tri | mester of the cours | se: 2. | | | | |
| Course level: I., | II. | | | | | | |
| Prerequisities: | | | | | | | |
| Conditions for Presentation of Should corona- | course comp the project in virus quarant | letion: written form. Oral ine persist, written r | exam and discuss eport and answer | sion of the prese to posed question | nted project. | | |
| Learning outco By using examp interpretation of including parasi | mes: les from the f complex sy te/host coeve | biology to learn app stems. Introduction plution. | olications of optin to new paradigm | nization techniq is in the area of | ues on study and systems biology, | | |
| Brief outline of Complex syste optimization te simulated annea dynamics, prot bioinformatics. | the course: ms, emerger chniques on lling, taboo s ein folding. | nt behavior. Evolu complex systems earch/ on selected p Population dynam | tionary theory Application of problems of bion mics, metabolic | and memetics. f methods /gen nolecular simula networks and | Application of etic algorithms, tions. Molecular complexity in | | |
| Recommended The actual scien | literature: tific papers. | | | | | | |
| Course languag | ge: | | | | | | |
| Notes: | | | | | | | |
| Course assessm Total number of | ent assessed stu | dents: 44 | | | | | |
| А | В | C | D | E | FX | | |
| 88.64 | 88.64 4.55 4.55 2.27 0.0 0.0 | | | | | | |
| Provides: doc. F | RNDr. Jozef | Uličný, CSc. | | | | | |
| Date of last mo | dification: 2 | 7.03.2020 | | | | | |
| Approved: prof | . RNDr. Micl | nal Jaščur, CSc. | | | | | |

| University: P. J. | University: P. J. Šafárik University in Košice | | | | |
|---|--|--|--|---|--|
| Faculty: Faculty | of Science | | | | |
| Course ID: ÚFV FPK1/07 | // Course n | ame: Phase Trans | sitions and Critics | al Phenomena | |
| Course type, sco Course type: L Recommended Per week: 3 Pe Course method | Course type, scope and the method: Course type: Lecture Recommended course-load (hours): Per week: 3 Per study period: 42 Course method: present | | | | |
| Number of ECT | FS credits: 4 | | | | |
| Recommended | semester/trime | ster of the cours | e: 2. | | |
| Course level: II. | | | | | |
| Prerequisities: | | | | | |
| Conditions for Examination | course complet | ion: | | | |
| Learning outco To acquaint stud | mes: lents with based | problems of the | phase transitions | and critical phen | nomena. |
| Brief outline of Thermodynamic universality. Mi dimensions. Me | the course: es of phase tran croscopic mode an field theory | nsitions. Classific els of the magneti of the Ising mode | ation of phase t to phase transitio l. Landau theory | ransitions. Critic ns. Ising model of phase transitic | cal phenomena, in one and two ons. |
| Recommended 1. Stanley H.G.: Oxford, Oxford 2. Reichl L.E.: A 3. Plischke M., A 4. Kadanoff L.P Singapore, 2000 | Recommended literature: 1. Stanley H.G.: Introduction to Phase Transitions and Critical Phenomena, Clarendon Press Oxford, Oxford, 1971. 2. Reichl L.E.: A Modern Course in Statistical Physics, University of Texas Press, Austin, 1980. 3. Plischke M., Bergersen B.: Equilibrium Statistical Physics, World Scientific, Singapore, 1994. 4. Kadanoff L.P.: Statistical Physics, Statistics, Dynamics and Renormalization, World Scientific, Singapore, 2000 | | | | |
| Course language: 1. Slovak, 2. English | | | | | |
| Notes: | | | | | |
| Course assessm Total number of | ent assessed studer | nts: 119 | | | |
| А | В | С | D | Е | FX |
| 57.14 | 57.14 10.92 11.76 14.29 5.88 0.0 | | | | 0.0 |
| Provides: prof. RNDr. Andrej Bobák, DrSc. | | | | | |
| Date of last mo | dification: 19.0 | 2.2021 | | | |
| Approved: prof | . RNDr. Michal | Jaščur, CSc. | | | |
| <u> </u> | | | | | |

| University: P. J | . Šafárik Univers | ity in Košice | | | |
|--|---|---|------------------|----------|----------|
| Faculty: Facult | y of Science | | | | |
| Course ID: ÚF PSP/19 | V/ Course na | Course name: Practical Guide to Scientific Routine for Students | | | |
| Course type, sc Course type: I Recommended Per week: 2 Pe Course metho | ope and the met Practice d course-load (h er study period: d: present | thod: ours): 28 | | | |
| Number of EC | FS credits: 2 | | | | |
| Recommended | semester/trimes | ster of the cours | e: 2., 4. | | |
| Course level: II | • | | | | |
| Prerequisities: | | | | | |
| Conditions for | course completi | on: | | | |
| Learning outco | omes: | | | | |
| Brief outline of | the course: | | | | |
| Recommended | literature: | | | | |
| Course languag | ge: | | | | |
| Notes: | | | | | |
| Course assessm Total number of | ent f assessed studen | .ts: 2 | | | |
| А | В | С | D | Е | FX |
| 100.0 | 100.0 0.0 0.0 0.0 0.0 0.0 | | | | |
| Provides: RND | r. Martin Gmitra | , PhD. | | <u> </u> | <u> </u> |
| Date of last mo | dification: 30.03 | 3.2020 | | | |
| Approved: prof | . RNDr. Michal | Jaščur, CSc. | | | |

| University: P I | Šafárik Univer | sity in Košice | | | | |
|--|---|------------------------------------|----------------|-------------------|------------------|--|
| Faculty: Faculty | v of Science | | | | | |
| Course ID: ÚF PRA/13 | V/ Course n | Course name: Practice in Astronomy | | | | |
| Course type, sc Course type: I Recommended Per week: 3 Pe Course metho | Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 3 Per study period: 42 Course method: present | | | | | |
| Number of EC | FS credits: 3 | | | | | |
| Recommended | semester/trime | ester of the cours | e: 1. | | | |
| Course level: II | | | | | | |
| Prerequisities: | ÚFV/APR/17 | | | | | |
| Conditions for | course comple | tion: | | | | |
| Learning outco Acquaint stude determination o | mes: nts with a bas f position of ob | sic reduction of jects. | photometric ob | oservations and v | vith astrometric | |
| Brief outline of Photometric of Astrometric tran | the course: oservations, rec nsformation, W | luction and cali CS system | bration, measu | rements of brigh | ntness of stars. | |
| Recommended literature: 1. Howell : 2000, Handbook of CCD Astronomy, Cambridge University Press. 2. Lena et al.: 1996, Observational Astrophysics, Springer-Verlag 3. Martinez a Klotz: 1998, A practical giude to CCD Astronomy, Cambridge University Press. | | | | | | |
| Course language: Slovak, English | | | | | | |
| Notes: | | | | | | |
| Course assessment Total number of assessed students: 11 | | | | | | |
| А | В | C | D | Е | FX | |
| 100.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Provides: Mgr. | Provides: Mgr. Marek Husárik, PhD. | | | | | |
| Date of last mo | dification: 03.0 | 5.2015 | | | | |
| Approved: prof. RNDr. Michal Jaščur, CSc. | | | | | | |
| - | | | | | | |

| University: P. J. Š | afárik Univers | ity in Košice | | | | |
|--|--|---------------------------------------|--|---|-----------------------------------|--|
| Faculty: Faculty o | of Science | | | | | |
| Course ID: ÚFV/ PRAF/13 | Course na | Course name: Practice in Astrophysics | | | | |
| Course type, scop Course type: Pra Recommended c Per week: 4 Per Course method: | e and the met actice ourse-load (h study period: present | hod: ours): 56 | | | | |
| Number of ECTS | credits: 4 | | | | | |
| Recommended se | mester/trimes | ter of the course | e: 2. | | | |
| Course level: II. | | | | | | |
| Prerequisities: ÚF | FV/TAF1/13 | | | | | |
| Conditions for co Continual valuation Based on continua | urse completion based on the al valuation. | on: e partial fulfillme | nt of tasks | | | |
| Learning outcome Acquaint students | es: with a reducti | on of spectroscop | pical observation | s of the Sun and | stellar objects. | |
| Brief outline of the Acquisition of specific intensities, determined by the Acquisition of specific action of the Acquisities and the Acquisities action of the Acquisities actis action of the Acquisit | ectra and their nination of the | reduction, calibra | ation, measurements it in the atmospheric structure of the atmospheric str | ent of radial velo osphere of the Su | cities and line's n and stars. | |
| Recommended lit 2. Appenzeller, I., | Recommended literature: 2. Appenzeller, I., Introduction to Astronomical Spectroscopy, Cambridge University Press, 2012 | | | | ity Press, 2012 | |
| Course language: Slovak, English | | | | | | |
| Notes: | | | | | | |
| Course assessment Total number of assessed students: 11 | | | | | | |
| Α | В | С | D | Е | FX | |
| 100.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Provides: doc. Mgr. Štefan Parimucha, PhD. | | | | | | |
| Date of last modif | fication: 03.05 | .2015 | | | | |
| Approved: prof. R | RNDr. Michal J | laščur, CSc. | | | | |

| University: P. J. Šafán | ik University in Košice |
|---|---|
| Faculty: Faculty of So | cience |
| Course ID: KPPaPZ/PPZMg/12 | Course name: Psychology and Health Psychology (Master's Study) |
| Course type, scope at Course type: Lectur Recommended cour Per week: 1 / 2 Per Course method: pre | nd the method: e / Practice rse-load (hours): study period: 14 / 28 sent |
| Number of ECTS cre | edits: 4 |
| Recommended semes | ster/trimester of the course: |
| Course level: II. | |
| Prerequisities: | |
| Conditions for cours a) Active work during instructors); continuo in the range of maxir max. 15 points. A ma b) Written examinatio of the lecture. The wr 3 points) with a maxir Conditions for admiss c) Exam: written form You need to get at lea Rating: 65 and less FX; 66 - 72 E; 73 - 79 D; 80 - 86 C; 87 - 93 B; 94 - 100 A. The final evaluation r A more detailed expla | e completion: the whole semester (according to the ongoing instructions of the lecturer and us control of study results at seminars during the teaching part of the semester num 5 points. Preparation, presentation and discussion on a selected topic - ximum of 2 absences are allowed. n of the topics of lectures in the 9th week of the semester at the time and place itten examination will consist of 10 questions of a factual nature (1 question / mum of 30 points. sion to the exam: completion of seminars and obtaining at least 25 points. n (50 points / 10 questions of factual-evaluation character of 5 points each) st half of the 50 points. |
| of an agreement for th Any modifications to Rector are listed in th | the 1st exercise of the semester. the implementation of the course in connection with the current order of the e electronic board of the course. |
| Learning outcomes: Students will be able which will be given an life. They will gain or are closely related to t such as educational p are allowed to comm | to orient themselves in the basic concepts and theories of health psychology, n interesting and engaging explanation, accompanied by many examples from ientation in current topics, which are the content of health psychology or they he issues not only of this discipline, but also of other psychological disciplines sychology, personality psychology and the like. Within the course, students unicate freely with the teacher and discuss the topics with other classmates. |

Students can practically apply the knowledge from the subject especially in the field of prevention of burnout syndrome and support of mental health in the work of a teacher.

Brief outline of the course:

1 Introduction to health psychology

2 Psychoimmunology

3 Personality factors and health

- 4 Social support as a protective factor in relation to health
- 5 Subjective well-being
- 6 Stress and stressful situations and ways to manage them
- 7 Burnout syndrome
- 8 Health-promoting behavior, mental hygiene
- 9 Health risk behavior
- 10 School as an important factor of health

Recommended literature:

Křivohlavý, J.: Psychologie zdraví. Portál, Praha 2001.

Křivohlavý, J.: Psychologie nemoci. Grada, Praha, 2002.

Křivohlavý, J.: Psychologie moudrosti a dobrého života. Grada, Praha, 2009.

Kebza, V.: Psychosociální determinanty zdraví. Academia, Praha 2005.

Kahneman, D., Diener, E., Schwarz, N.(Eds), Well-Being. The Foundations of Hedonic

Psychology. New York, Russell Sage Foundation, 2003.

Kaplan, R. M.: Zdravie a správanie človeka. SPN, Bratislava 1996.

Sarafino, E. P.: Health Psychology. Biopsychosocial interactions. John Wiley and sons 1994.

Baštecký, J., Šavlík, J., Šimek, J. 1993. Psychosomatická medicína. Praha: Grada

Tress, W., Krusse, J., Ott, J.: Základní psychosomatická péče. Portál, Praha 2008.

Course language:

slovak

Notes:

Course assessment

Total number of assessed students: 226

| А | В | С | D | Е | FX |
|-------|-------|-------|-------|-------|------|
| 19.47 | 25.22 | 25.66 | 13.27 | 15.93 | 0.44 |

Provides: PhDr. Anna Janovská, PhD., Mgr. Lucia Barbierik, PhD.

Date of last modification: 16.02.2021

Approved: prof. RNDr. Michal Jaščur, CSc.

| University: P. J. Šafárik University in Košice | | | | | |
|--|--|---|---|---|--|
| Faculty: Faculty of S | Science | | | | |
| Course ID: ÚFV/ KTP1a/03 | 7/ Course name: Quantum Field Theory I | | | | |
| Course type, scope and the method: Course type: Lecture / Practice Recommended course-load (hours): Per week: 3 / 1 Per study period: 42 / 14 Course method: present | | | | | |
| Number of ECTS c | redits: 6 | | | | |
| Recommended sem | ester/trimes | ter of the cours | e: 1. | | |
| Course level: II. | | | | | |
| Prerequisities: | | | | | |
| Conditions for cour homeworks; their pr | se completion and esentation and esentation and esercited estimation and estimates and | on: nd common anal <u>y</u> | ysis of problem | under consideration | on, exam |
| Learning outcomes To offer basic knowle and phenomena in p | edges about t hysical syste | modern trends an ems with infinite | d theoretical me degrees of freed | thods in descriptic | on of microword |
| Conception of relativ formalism. Symmetr fields - scalar, spin Gordon and Dirac en Quantization of free fields. | vistic quantu ies and relate or, electrom quations, Ma e fileds. Bas | im field. Particle ed conservation la agnetic and vec axwell equations ic commutating | s as quantum flu aws for currents. tor. Equations f . Lagrangeans a and anticommu | uctuations of this Euler-Lagrange of for free classical nd Hamiltonians atating relatios fo | field. Lagrange equations. Basic fields - Klein- for these fields. or free quantum |
| Recommended liter Bogoljubov N.N., Ši vydanie); Moskva, M Bjorken J.D., Drell S Feynmann R.P.: Pho Vzaimodejstvije foto | ature: rkov D.V.: V Jauka 1984 (S.D.: Relativ ton-Hadron pnov s adron | Vvedenie v teoriu (4. Vydanie). ristic quantum fie Interactions, Ber ami, Mir, Moskv | ı kvantovannych Ids (dva diely), Ijamin,New Yor a, 1975. | n polej, Moskva, 1 McGraw-Hill, Ne k, 1972; ruský pre | 1957 (prvé ew York, 1966. eklad: |
| Course language: slovak and english | | | | | |
| Notes: | | | | | |
| Course assessment Total number of asse | essed studen | ts: 66 | | | |
| A | В | С | D | Е | FX |
| 53.03 | 21.21 | 7.58 | 6.06 | 10.61 | 1.52 |
| Provides: prof. RND | r. Michal H | natič, DrSc., RN | Dr. Tomáš Lučiv | vjanský, PhD. | |
| Date of last modific | ation: 27.05 | .2015 | | | |

Approved: prof. RNDr. Michal Jaščur, CSc.

| University: P. J | . Šafárik Univers | ity in Košice | | | | | |
|--|---|--|---|--|--|--|--|
| Faculty: Facult | y of Science | | | | | | |
| Course ID: ÚF KTP1b/03 | V/ Course na | Course name: Quantum Field Theory II | | | | | |
| Course type, sc Course type: 1 Recommender Per week: 3 / 2 Course metho | ope and the me Lecture / Practice I course-load (h I Per study peri d: present | thod: ours): od: 42 / 14 | | | | | |
| Number of EC | FS credits: 6 | | | | | | |
| Recommended | semester/trimes | ster of the cours | se: 2. | | | | |
| Course level: II | • | | | | | | |
| Prerequisities: | ÚFV/KTP1a/03 | | | | | | |
| Conditions for homeworks, the | course completies ir presentation a | on: nd common anal | ysis of the probl | em under conside | ration; exam | | |
| Learning outco To offer basic ki and phenomena | mes: nowledges about in physical syst | modern trends ar ems with infinite | nd theoretical met degrees of freed | thods in descriptic lom. | on of microword | | |
| Brief outline of Interacting field Lagrange opera calculation of S the proton on of divergences of | the course: ds. The principl ator in QED. S S - matrix. S - n electron cross set the Feynman gra | e of symmetry a – matrix. Wick natrix and cross ection calculation phs. Running com | and the form of theorems and I section of the p n in QCD frame upling constant. | Finteractions of of Feynman diagram rocesses. Compto e. Radiation corro | quantum fields. ns. Perturbative on scattering of ections and the | | |
| Recommended Bogoljubov N.N vydanie); Mosk Itzykon C., Zub Icikon K., Zjub Mir, Moskva, 1 Ryder L.H.: Qu preklad: Rajder | literature: N., Širkov D.V.: ` va, Nauka 1984 er J.B.: Quantun er Z.B.: Kvantov 984. antum field theo L.: Kvantovaja | Vvedenie v teorii (4. Vydanie) n field theory,Mc aja teoria polja, ry, Cambridge U reoria polja, Mir, | u kvantovannych Graw-Hill, New niversity Press, 1 Moskva, 1987. | 1 polej, Moskva, 1 York, 1986; rusk 1985; ruský | .957 (prvé ý preklad: | | |
| Course languages slovak and engli | ge: ish | | | | | | |
| Notes: | | | | | | | |
| Course assessm Total number of | ent f assessed studen | ts: 57 | | | | | |
| A | В | С | D | E | FX | | |
| 52.63 | 29.82 | 7.02 | 5.26 | 5.26 | 0.0 | | |
| Provides: prof. | RNDr. Michal H | natič, DrSc., RN | Dr. Tomáš Lučiv | vjanský, PhD. | | | |

Date of last modification: 30.03.2020

Approved: prof. RNDr. Michal Jaščur, CSc.

| University: | University: P. J. Šafárik University in Košice | | | | | | |
|--|---|---|--|---|--|--|---|
| Faculty: Fa | culty of Scie | ence | | | | | |
| Course ID: KTM/14 | ÚFV/ C | JFV/ Course name: Quantum Theory of Magnetism | | | | | |
| Course typ Course tyj Recomme Per week: Course me | Course type, scope and the method: Course type: Lecture Recommended course-load (hours): Per week: 3 Per study period: 42 Course method: present | | | | | | |
| Number of | ECTS cred | its: 5 | | | | | |
| Recommen | ded semeste | er/trimester | of the cours | e: 3. | | | |
| Course leve | el: II., III. | | | | | | |
| Prerequisit | ies: | | | | | | |
| Conditions | for course | completion: | | | | | |
| Learning o | utcomes: | | | | | | |
| The definit one-dimens method. Va models. Th fermionizat Primakoff t | tion of basi sional quant alence-bond- e one-dimer tion and qua transformatio | c lattice-stat um Heisenb crystal grou usional quant antum critica on. | istical mode erg model, nd states of um XY mod l points. The | els in the qu spin waves the Majum el in a transv e spin-wave | antum theo and the gr adar-Ghosh a verse magnet theory, boso | ry of magn ounds of B and Shastry- tic field, Jord onization and | etism. The ethe-ansatz -Sutherland dan-Wigner d Holstein- |
| Recommen 1. J. B. Parl Physics 816 2. U. Schol Physics 645 3. N. Majlis | Recommended literature: 1. J. B. Parkinson, D. J. J. Farnell, An Introduction to Quantum Spin Systems, Lecture Notes in Physics 816 (Springer, Berlin Heidelberg, 2010). 2. U. Schollwock, J. Richter, D. J. J. Farnell, R. F. Bishop, Quantum Magnetism, Lecture Notes in Physics 645 (Springer, Berlin Heidelberg, 2004). 3. N. Mailis, The Quantum Theory of Magnetism (World Scientific, Singapore, 2000). | | | | | | |
| Course lan EN - englis | guage: h | | | | | | |
| Notes: | | | | | | | |
| Course asso Total numb | essment er of assesse | ed students: 2 | 2 | | | | |
| Α | В | C | D | Е | FX | Ν | Р |
| 13.64 | 36.36 | 18.18 | 4.55 | 9.09 | 4.55 | 0.0 | 13.64 |
| Provides: d | oc. RNDr. Jo | ozef Strečka, | PhD. | | | | |
| Date of last | modificatio | on: 03.05.201 | 5 | | | | |
| Approved: | prof. RNDr. | Michal Jašču | ır, CSc. | | | | |
| | | | | | | | |

| University: P. J. Šafá | rik University in Košice | | | | | | |
|--|--|--|--|--|--|--|--|
| Faculty: Faculty of S | Science | | | | | | |
| Course ID: ÚTVŠ/ ÚTVŠ/CM/13 | Course ID: ÚTVŠ/ Course name: Seaside Aerobic Exercise UTVŠ/CM/13 | | | | | | |
| Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: Per study period: 36s Course method: combined, present | | | | | | | |
| Number of ECTS cr | edits: 2 | | | | | | |
| Recommended seme | ester/trimester of the cours | e: | | | | | |
| Course level: I., II. | - | | | | | | |
| Prerequisities: | | | | | | | |
| Conditions for cours Conditions for cours Attendance | se completion: e completion: | | | | | | |
| Learning outcomes: Students will be pro- conditions actively a Students will acquire the aim to improve the | ovided an overview of pos and their skills in work and e practical experience in org he stay and to create positive | sibilities how to spend leisure time in seaside l communication with clients will be improved. anising the cultural and art-oriented events, with e experiences for visitors. | | | | | |
| Brief outline of the course: Brief outline of the course: 1. Basics of seaside aerobics 2. Morning exercises 3. Pilates and its application in seaside conditions 4. Exercises for the spine 5. Yoga basics 6. Sport as a part of leisure time 7. Application of projects of productive spending of leisure time for different age and social groups (children, young people, elderly) 8. Application of seaside cultural and art oriented activities in leigure time | | | | | | | |
| Recommended literature: | | | | | | | |
| Course language: | | | | | | | |
| Notes: | | | | | | | |
| Course assessment Total number of asse | essed students: 41 | | | | | | |
| | abs | n | | | | | |
| 12.2 87.8 | | | | | | | |

Provides: Mgr. Agata Horbacz, PhD.

Date of last modification: 15.03.2019

Approved: prof. RNDr. Michal Jaščur, CSc.

| University: P. J. | . Šafárik Univers | ity in Košice | | | |
|---|--|-------------------|--------|------|-----|
| Faculty: Faculty | y of Science | | | | |
| Course ID: ÚF SPTFAa/14 | ourse ID: ÚFV/ Course name: Semestral Work I PTFAa/14 | | | | |
| Course type, sc Course type: Recommended Per week: Per Course metho | ope and the met d course-load (h r study period: d: present | hod: ours): | | | |
| Number of EC | 1 S creaits: 2 | | 1 | | |
| Recommended | semester/trimes | ster of the cours | se: 1. | | |
| Course level: II | • | | | | |
| Prerequisities: | | | | | |
| Conditions for | course completi | on: | | | |
| Learning outco | mes: | | | | |
| Brief outline of | the course: | | | | |
| Recommended | literature: | | | | |
| Course languag | ge: | | | | |
| Notes: | | | | | |
| Course assessm Total number of | ent f assessed studen | ts: 27 | | | |
| А | В | С | D | E | FX |
| 85.19 | 7.41 | 0.0 | 0.0 | 7.41 | 0.0 |
| Provides: | | | l | | |
| Date of last mo | dification: 03.05 | 5.2015 | | | |
| Approved: prof | RNDr. Michal . | Jaščur, CSc. | | | |

| University: P. J. | . Šafárik Univers | ity in Košice | | | |
|--|--|-------------------|--------|----------|-----|
| Faculty: Faculty | y of Science | | | | |
| Course ID: ÚF SPTFAb/14 | Course ID: ÚFV/ Course name: Semestral Work II SPTFAb/14 | | | | |
| Course type, sc Course type: Recommended Per week: Per Course method | ope and the met d course-load (h r study period: d: present | thod: ours): | | | |
| Number of EC | IS credits: 6 | | 2 | | |
| Recommended | semester/trimes | ster of the cours | se: 2. | | |
| Course level: 11 | | | | | |
| Prerequisities: | | | | | |
| Conditions for | course completi | on: | | | |
| Learning outco | mes: | | | | |
| Brief outline of | the course: | | | | |
| Recommended | literature: | | | | |
| Course languag | ge: | | | | |
| Notes: | | | | | |
| Course assessm Total number of | ent f assessed studen | ts: 26 | | | |
| А | В | С | D | E | FX |
| 84.62 | 7.69 | 0.0 | 0.0 | 7.69 | 0.0 |
| Provides: | | <u>I</u> | | <u> </u> | |
| Date of last mo | dification: 03.05 | 5.2015 | | | |
| Approved: prof | RNDr. Michal | Jaščur, CSc. | | | |

| University: P. J. | . Šafárik Univers | ity in Košice | | | |
|---|--|-------------------|-------|-----|-----|
| Faculty: Faculty | y of Science | | | | |
| Course ID: ÚF SPTFAc/14 | Course ID: ÚFV/ PTFAc/14Course name: Semestral Work III | | | | |
| Course type, sc Course type: Recommended Per week: Per Course metho | ope and the met d course-load (h r study period: d: present | thod: ours): | | | |
| Number of EC | somoston/trimos | ston of the cours | or 2 | | |
| Course levels II | | ster of the cours | e: 5. | | |
| Course level: II | • | | | | |
| Prerequisities: | | | | | |
| Conditions for | course completi | on: | | | |
| Learning outco | mes: | | | | |
| Brief outline of | the course: | | | | |
| Recommended | literature: | | | | |
| Course languag | ge: | | | | |
| Notes: | | | | | |
| Course assessm Total number of | ent f assessed studen | ts: 23 | | | |
| А | В | С | D | Е | FX |
| 86.96 | 0.0 | 13.04 | 0.0 | 0.0 | 0.0 |
| Provides: | | <u> </u> | | | |
| Date of last mo | dification: 03.05 | 5.2015 | | | |
| Approved: prof | RNDr. Michal | Jaščur, CSc. | | _ | |

| University: P. J. Šafá | rik Univers | ity in Košice | | | |
|---|---|--|---|--|--|
| Faculty: Faculty of S | cience | | | | |
| Course ID: KPPaPZ/SPVKE/07 | Course na Situations | Course name: Social-Psychological Training of Coping with Critical Life Situations | | | |
| Course type, scope a Course type: Practic Recommended course Per week: 2 Per stu Course method: pre | nd the met ce rse-load (h dy period: esent | thod: ours): 28 | | | |
| Number of ECTS cr | edits: 2 | | | | |
| Recommended seme | ster/trimes | ster of the course: 2. | | | |
| Course level: II. | | | | | |
| Prerequisities: | | | | | |
| Conditions for cours | e completi | on: | | | |
| Learning outcomes: | | | | | |
| Brief outline of the c | ourse: | | | | |
| Recommended litera | iture: | | | | |
| Course language: | | | | | |
| Notes: | | | | | |
| Course assessment Total number of asses | Course assessment Total number of assessed students: 126 | | | | |
| abs | | n | Z | | |
| 97.62 | 97.62 2.38 0.0 | | | | |
| Provides: Mgr. Ondro | Provides: Mgr. Ondrej Kalina, PhD. | | | | |
| Date of last modification: 11.02.2021 | | | | | |
| Approved: prof. RNI | Dr. Michal . | Jaščur, CSc. | | | |

| University: P. J. Šaf | ărik Univers | ity in Košice | | | | | |
|---|--|---|--|---|--|--|--|
| Faculty: Faculty of | Science | | | | | | |
| Course ID: ÚFV/ FSL1/13 | Course name: Solar Physics | | | | | | |
| Course type, scope Course type: Lect Recommended co Per week: 4 Per st Course method: p | and the met are urse-load (h udy period: resent | hod: ours): 56 | | | | | |
| Number of ECTS c | redits: 6 | | | | | | |
| Recommended sem | ester/trimes | ster of the cours | e: 2. | | | | |
| Course level: II. | | | | | | | |
| Prerequisities: | | | | | | | |
| Conditions for cour solved exercises Exam | rse completi | on: | | | | | |
| Learning outcomes To give students a c area to the visible su space. To show an in areas of astrophysic | : comprehensiv rface, solar a nportance of s. | ve, physical 'up-t tmosphere and th the solar physics | to date' image of the effects of the s s for understandi | f the sun from the solar activity on the ng the evolution o | e deepest central he interplanetary of stars and other | | |
| Brief outline of the Preliminary definition magnetic fields and | course: ons and assume the dynamic | mptions, basic fa s of the Sun, The | cts about the sur Standard Solar | n, solar interior, so Model, solar acti | olar atmosphere. vity, solar cycle. | | |
| Recommended liter Zirin, H., Astrophys Physics of the Sun I Holzer, D.M. Mihal M. Stix: The Sun, A E. R. Priest: Solar M K. R. Lang: The Su | cature: sics of the Su . II. III. Geo as, R.K. Ulri as, Introduction fagnetohydro n from Space | n, Cambridge U physics and Astr ch, Riedel Publ. on, Springer, 2nd odynamics, Reid e, Springer, 2000 | niv. Press, Caml ophysics Monor Dodrecht 1968 I edition, 2002. el, 1982. | oridge, 1988 gaphs, eds: P.A. | Sturrock, T. E. | | |
| Course language: Slovak, English | | | | | | | |
| Notes: | | | | | | | |
| Course assessment Total number of ass | essed studen | ts: 12 | | | | | |
| A | A B C D E FX | | | | | | |
| 66.67 | 8.33 | 25.0 | 0.0 | 0.0 | 0.0 | | |
| Provides: Mgr. Pete | r Gömöry, P | hD. | | | | | |
| Date of last modifie | cation: 03.05 | 5.2015 | | | | | |

Approved: prof. RNDr. Michal Jaščur, CSc.

| University: P. J. Ša | fárik Univers | ity in Košice | | | | |
|--|--|--|-------------------------------|-------------------|------------------|--|
| Faculty: Faculty of | Science | | | | | |
| Course ID: ÚFV/ SSA/13 | Durse ID: ÚFV/ Course name: Special Seminar in Astronomy SA/13 SA/13 | | | | | |
| Course type, scope Course type: Prac Recommended co Per week: 3 Per s Course method: p | e and the met etice ourse-load (h tudy period: oresent | t hod: ours): 42 | | | | |
| Number of ECTS | credits: 3 | | | | | |
| Recommended sen | nester/trimes | ster of the course | e: 2. | | | |
| Course level: II. | | | | | | |
| Prerequisities: | | | | | | |
| Conditions for cou Due to Covid-19 ac Seminar essay. On the basis of con | rse completi dapted to carr tinuous asses | on: y out distance lea sment. | arning: | | | |
| Learning outcome Inform students abo | s: out recent res | ults of astronomi | cal and astrophy | ysical research. | | |
| Brief outline of the Recent discoveries cataclysmic variable | e course: in astrophysi les, quasars, d | ical research from lark matter and da | n domestic and ark energy. | world institutes, | like exoplanets, | |
| Recommended lite Current papers in a | rature: stronomical a | and astrophysical | journals, intern | et. | | |
| Course language: Slovak, English | | | | | | |
| Notes: | | | | | | |
| Course assessment Total number of as | Course assessment Total number of assessed students: 12 | | | | | |
| Α | В | С | D | E | FX | |
| 100.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Provides: doc. RNI | Provides: doc. RNDr. Rudolf Gális, PhD., doc. Mgr. Štefan Parimucha, PhD. | | | | | |
| Date of last modifi | Date of last modification: 30.03.2020 | | | | | |
| Approved: prof. R | NDr. Michal . | Jaščur, CSc. | | | | |

| University: P. J. Šafá | rik University in Košice | | | |
|--|--|--|--|--|
| Faculty: Faculty of S | beience | | | |
| Course ID: ÚTVŠ/ TVa/11 | Course name: Sports Activities I. | | | |
| Course type, scope a Course type: Practi Recommended cou Per week: 2 Per stu Course method: co | ind the method: ce rse-load (hours): idy period: 28 mbined, present | | | |
| Number of ECTS cr | redits: 2 | | | |
| Recommended seme | ester/trimester of the course: 1. | | | |
| Course level: I., I.II., | , II. | | | |
| Prerequisities: | | | | |
| Conditions for course Conditions for course Min. 80% of active p Learning outcomes: Increasing physical relationship of studen | se completion: e completion: participation in classes. condition and performance within individual sports. Strengthening the nts to the selected sports activity and its continual improvement. | | | |
| Brief outline of the of Brief outline of the of Within the optional s University provides floorball, yoga, pilat tennis, sports for unf In the first two seme and particularities of physical condition, of Last but not least, the means of a special pi In addition to these physical education tr | course: subject, the Institute of Physical Education and Sports of Pavol Jozef Šafárik for students the following sports activities: aerobics, basketball, badminton, es, swimming, body-building, indoor football, self-defence and karate, table it persons, streetball, tennis, and volleyball. esters of the first level of education students will master basic characteristics individual sports, motor skills, game activities, they will improve level of their coordination abilities, physical performance, and motor performance fitness. e important role of sports activities is to eliminate swimming illiteracy and by cogram of medical physical education to influence and mitigate unfitness. sports, the Institute offers for those who are interested winter and summer anings with an attractive program and organises various competitions, either at | | | |

Recommended literature:

Course language:

Notes:

the premises of the faculty or University or competitions with national or international participation.

| Course assessment Total number of assessed students: 14050 | | | | | | | |
|--|------|-----|-----|-----|------|------|-----|
| abs abs-A abs-B abs-C abs-D abs-E n neabs | | | | | | | |
| 88.48 | 0.07 | 0.0 | 0.0 | 0.0 | 0.04 | 7.51 | 3.9 |
| Provides: Mgr. Dana Dračková, PhD., Mgr. Agata Horbacz, PhD., Mgr. Dávid Kaško, PhD., Mgr. Zuzana Küchelová, PhD., doc. PaedDr. Ivan Uher, PhD., Mgr. Marek Valanský, prof. RNDr. Stanislav Vokál, DrSc., Mgr. Marcel Čurgali, Mgr. Patrik Berta, Mgr. Ladislav Kručanica, PhD. | | | | | | | |
| Date of last modification: 18.03.2019 | | | | | | | |
| Approved: prof. RNDr. Michal Jaščur, CSc. | | | | | | | |

| University: P. J. Šafá | rik University in Košice | | | | | | |
|--|---|--|--|--|--|--|--|
| Faculty: Faculty of S | cience | | | | | | |
| Course ID: ÚTVŠ/ TVb/11 | Course name: Sports Activities II. | | | | | | |
| Course type, scope a Course type: Practi Recommended cou Per week: 2 Per stu Course method: co | and the method: ce rse-load (hours): ady period: 28 mbined, present | | | | | | |
| Number of ECTS cr | edits: 2 | | | | | | |
| Recommended seme | ster/trimester of the course: 2. | | | | | | |
| Course level: I., I.II., | II. | | | | | | |
| Prerequisities: | | | | | | | |
| Conditions for course Conditions for course Final assessment and | se completion: e completion: active participation in classes - min. 75%. | | | | | | |
| Learning outcomes: Learning outcomes: Increasing physical relationship of studer | condition and performance within individual sports. Strengthening the ints to the selected sports activity and its continual improvement. | | | | | | |

Brief outline of the course:

Brief outline of the course:

Within the optional subject, the Institute of Physical Education and Sports of Pavol Jozef Šafárik University provides for students the following sports activities: aerobics, basketball, badminton, floorball, yoga, pilates, swimming, body-building, indoor football, self-defence and karate, table tennis, sports for unfit persons, streetball, tennis, and volleyball.

In the first two semesters of the first level of education students will master basic characteristics and particularities of individual sports, motor skills, game activities, they will improve level of their physical condition, coordination abilities, physical performance, and motor performance fitness. Last but not least, the important role of sports activities is to eliminate swimming illiteracy and by means of a special program of medical physical education to influence and mitigate unfitness. In addition to these sports, the Institute offers for those who are interested winter and summer

physical education trainings with an attractive program and organises various competitions, either at the premises of the faculty or University or competitions with national or international participation.

Recommended literature:

Course language:

Notes:

| Course assessment Total number of assessed students: 11330 | | | | | | | |
|--|------|------|-----|-----|------|------|------|
| abs abs-A abs-B abs-C abs-D abs-E n neabs | | | | | | | |
| 85.75 | 0.56 | 0.02 | 0.0 | 0.0 | 0.05 | 9.87 | 3.75 |
| Provides: Mgr. Dana Dračková, PhD., Mgr. Agata Horbacz, PhD., Mgr. Dávid Kaško, PhD., Mgr. Zuzana Küchelová, PhD., doc. PaedDr. Ivan Uher, PhD., Mgr. Marek Valanský, prof. RNDr. Stanislav Vokál, DrSc., Mgr. Marcel Čurgali, Mgr. Patrik Berta, Mgr. Ladislav Kručanica, PhD. | | | | | | | |
| Date of last modification: 18.03.2019 | | | | | | | |
| Approved: prof. RNDr. Michal Jaščur, CSc. | | | | | | | |

| University: P. J. Šafárik University in Košice | | | | | | | |
|--|-----------------------------|---|--------------|--------------|-------|------|-------|
| Faculty: Fa | Faculty: Faculty of Science | | | | | | |
| Course ID: TVc/11 | ÚTVŠ/ | ÚTVŠ/ Course name: Sports Activities III. | | | | | |
| Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 2 Per study period: 28 Course method: combined present | | | | | | | |
| Number of | ECTS cr | edits: 2 | | | | | |
| Recommen | ded seme | ster/trimester | of the cours | e: 3. | | | |
| Course leve | e l: I., I.II., | II. | | | | | |
| Prerequisit | ies: | | | | | | |
| Conditions | for cours | e completion: | | | | | |
| Learning o | utcomes: | | | | | | |
| Brief outlin | e of the c | ourse: | | | | | |
| Recommen | ded litera | ture: | | | | | |
| Course lang | guage: | | | | | | |
| Notes: | | | | | | | |
| Course asso Total numb | essment er of asses | ssed students: 8 | 383 | | | | |
| abs | abs-A | abs-B | abs-C | abs-D | abs-E | n | neabs |
| 90.11 | 0.05 | 0.01 | 0.0 | 0.0 | 0.02 | 4.04 | 5.76 |
| Provides: Mgr. Marcel Čurgali, Mgr. Dana Dračková, PhD., Mgr. Agata Horbacz, PhD., Mgr. Dávid Kaško, PhD., Mgr. Zuzana Küchelová, PhD., doc. PaedDr. Ivan Uher, PhD., Mgr. Marek Valanský, prof. RNDr. Stanislav Vokál, DrSc., Mgr. Patrik Berta, Mgr. Ladislav Kručanica, PhD. | | | | | | | |
| Date of last modification: 03.05.2015 | | | | | | | |
| Approved: prof. RNDr. Michal Jaščur, CSc. | | | | | | | |

| University: P. J. Šafárik University in Košice | | | | | | | |
|--|-----------------------------|---|--------------|--------------|-------|------|-------|
| Faculty: Fac | Faculty: Faculty of Science | | | | | | |
| Course ID: TVd/11 | ÚTVŠ/ | TVŠ/ Course name: Sports Activities IV. | | | | | |
| Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: 2 Per study period: 28 Course method: combined, present | | | | | | | |
| Number of | ECTS cro | edits: 2 | | | | | |
| Recommen | ded seme | ster/trimester | of the cours | e: 4. | | | |
| Course leve | l: I., I.II., | II. | | | | | |
| Prerequisiti | ies: | | | | | | |
| Conditions | for cours | e completion: | | | | | |
| Learning ou | utcomes: | | | | | | |
| Brief outlin | e of the c | ourse: | | | | | |
| Recommen | ded litera | ture: | | | | | |
| Course lang | guage: | | | | | | |
| Notes: | | | | | | | |
| Course asse Total numbe | essment er of asses | ssed students: 5 | 101 | | | | |
| abs | abs-A | abs-B | abs-C | abs-D | abs-E | n | neabs |
| 85.2 | 0.29 | 0.04 | 0.0 | 0.0 | 0.0 | 6.76 | 7.7 |
| Provides: Mgr. Marcel Čurgali, Mgr. Dana Dračková, PhD., Mgr. Agata Horbacz, PhD., Mgr. Dávid Kaško, PhD., Mgr. Zuzana Küchelová, PhD., doc. PaedDr. Ivan Uher, PhD., Mgr. Marek Valanský, prof. RNDr. Stanislav Vokál, DrSc., Mgr. Patrik Berta, Mgr. Ladislav Kručanica, PhD. | | | | | | | |
| Date of last modification: 03.05.2015 | | | | | | | |
| Approved: prof. RNDr. Michal Jaščur, CSc. | | | | | | | |

| University: P. J. Šafá | rik University in Košice | | | | | | | |
|---|---|--|--|--|--|--|--|--|
| Faculty: Faculty of Science | | | | | | | | |
| Course ID: ÚMV/ NPR/19 | Course name: Stochastic processes | | | | | | | |
| Course type, scope a Course type: Lectur Recommended cour Per week: 3 / 2 Per Course method: pre | nd the method: re / Practice rse-load (hours): study period: 42 / 28 esent | | | | | | | |
| Number of ECTS cr | edits: 6 | | | | | | | |
| Recommended seme | ster/trimester of the course: 4. | | | | | | | |
| Course level: II. | | | | | | | | |
| Prerequisities: | | | | | | | | |
| Conditions for cours Test and individual p Exam | e completion: roject work. | | | | | | | |
| Learning outcomes: To obtain knowledge domain. To study properties o their application in fi | of the stationary stochastic processes analysis in time domain and spectral f random processes with discrete time (time series) and continuous time and nance. | | | | | | | |
| Brief outline of the c Stationary precess, Time domain analy Frequency domain Prediction of time Random processes Brownian motion, The Black-Scholes | ourse: linear process, causal and invertible process. ysis (autocovariance and partial autocovariance function) analysis (spectral density and distribution function, periodogram) series with continuous time (fundamental concepts) Itô's process, Itô's lemma and its application o formula | | | | | | | |
| Recommended litera 1. Brockwell P., Davi York, 2016 2. Prášková Z.: Zákla 3. Tsay R.: Analysis o 4. Shumway R., Stoff Springer, New York, 5. Melicherčík I., Olš 2005 (in Slovak) 6. Oksendal B.K.: Sto | s R.: Introduction to Time Series and Forecasting, 3rd ed., Springer, New dy náhodných procesů II, Karolinum, Praha, 2004 (in Czech) of Financial Time Series, 3rd ed., Wiley Interscience, New Jersey, 2010 fer D.: Time Series Analysis and Its Applications with R Examples, 4th ed., 2017 arová L., Úradníček V.: Kapitoly z finančnej matematiky, Epos, Bratislava, ochastic Differential Equations, 6th ed., Springer, 2014 | | | | | | | |
| Course language: Slovak | | | | | | | | |

| Course assessment Total number of assessed students: 55 | | | | | | | | |
|--|--|--|--|--|--|--|--|--|
| A B C D E FX | | | | | | | | |
| 32.73 | 32.73 29.09 16.36 12.73 7.27 1.82 | | | | | | | |
| Provides: prof. | Provides: prof. RNDr. Ivan Žežula, CSc., RNDr. Martina Hančová, PhD. | | | | | | | |
| Date of last modification: 11.03.2019 | | | | | | | | |
| Approved: prof. RNDr. Michal Jaščur, CSc. | | | | | | | | |

| University: P. J | . Šafárik Univers | ity in Košice | | | | | | |
|---|---|-------------------|----|--|--|--|--|--|
| Faculty: Facult | Faculty: Faculty of Science | | | | | | | |
| Course ID: ÚF SVK/13 | Course ID: ÚFV/ SVK/13Course name: Student Scientific Conference | | | | | | | |
| Course type, sc Course type: Recommended Per week: Per Course metho | cope and the met d course-load (h r study period: d: present | thod: ours): | | | | | | |
| Number of EC | 1 S credits: 4 | | | | | | | |
| Recommended | semester/trimes | ster of the cours | e: | | | | | |
| Course level: I. | , II. | | | | | | | |
| Prerequisities: | | | | | | | | |
| Conditions for | course completi | on: | | | | | | |
| Learning outco | omes: | | | | | | | |
| Brief outline of | the course: | | | | | | | |
| Recommended | literature: | | | | | | | |
| Course languag | ge: | | | | | | | |
| Notes: | | | | | | | | |
| Course assessment Total number of assessed students: 43 | | | | | | | | |
| А | A B C D E FX | | | | | | | |
| 100.0 | 100.0 0.0 0.0 0.0 0.0 | | | | | | | |
| Provides: | | | | | | | | |
| Date of last modification: | | | | | | | | |
| Approved: prof. RNDr. Michal Jaščur, CSc. | | | | | | | | |
| University: P. J. Šafá | rik University in Košice |
|---|---|
| Faculty: Faculty of S | cience |
| Course ID: ÚTVŠ/ LKSp/13 | Course name: Summer Course-Rafting of TISA River |
| Course type, scope a Course type: Practic Recommended cour Per week: Per stud Course method: cor | nd the method: ce rse-load (hours): y period: 36s mbined, present |
| Number of ECTS cr | edits: 2 |
| Recommended seme | ster/trimester of the course: |
| Course level: I., II. | |
| Prerequisities: | |
| Conditions for course Conditions for course Attendance Final assessment: Rat | e completion: completion: ft control on the waterway (attended/not attended) |
| Learning outcomes: Learning outcomes: Students have knowled | edge of rafts (canoe) and their control on waterway. |
| Brief outline of the c Brief outline of the co 1. Assessment of diff 2. Safety rules for raf 3. Setting up a crew 4. Practical skills trai 5. Canoe lifting and co 6. Putting the canoe i 7. Getting in the canoe 8. Exiting the canoe 9. Taking the canoe o 10. Steering a) The pry stroke (on b) The draw stroke 11. Capsizing 12. Commands | ourse: purse: iculty of waterways ting ning using an empty canoe arrying n the water without a shore contact re ut of the water fast waterways) |
| Recommended litera | ture: |
| Course language: | |
| Notes: | |

| Course assessment Total number of assessed students: 153 | | | | | |
|---|-------|--|--|--|--|
| abs n | | | | | |
| 45.75 | 54.25 | | | | |
| Provides: Mgr. Dávid Kaško, PhD. | | | | | |
| Date of last modification: 18.03.2019 | | | | | |
| Approved: prof. RNDr. Michal Jaščur, CSc. | | | | | |

| University: P. J. Šafá | rik Universi | ty in Košice | | | | | | |
|--|---|--|--|--|--|--|--|--|
| Faculty: Faculty of Science | | | | | | | | |
| Course ID: ÚFV/ PAF/13 | Course name: Summer Practice in Astrophysics | | | | | | | |
| Course type, scope a Course type: Practi- Recommended cou Per week: Per stud Course method: pre | Course type, scope and the method: Course type: Practice Recommended course-load (hours): Per week: Per study period: 7d Course method: present | | | | | | | |
| Number of ECTS cr | edits: 5 | | | | | | | |
| Recommended seme | ster/trimest | ter of the course: 2. | | | | | | |
| Course level: II. | | | | | | | | |
| Prerequisities: | | | | | | | | |
| Conditions for cours Observation project. On the basis of contin | se completion | ment. | | | | | | |
| Learning outcomes: The aim of the prac observations and data | tice is gaining a processing | ng practical experience with the | photometric and spectroscopic | | | | | |
| Brief outline of the c Practical photometri detectors at Observat interpretation of obta | course: c and spectory at Kolor ined results. | troscopic observations of variant in the second state of the secon | ble stars using telescopes and sis of the observational data and | | | | | |
| Recommended litera 1. Howell, S. B., Har 2. Léna, P., Rouan, D Verlag, Berlin, 1996; 3. Martinez P., Klotz Cambridge, 1998; | ature: adbook of Co D., Lebrun, F. A., A practi | CD Astronomy, Cambridge Univ , Mignard, F., Pelat, D., Observa cal guide to CCD Astronomy, Ca | ersity Press, Cambridge, 2000; tional Astrophysics, Springer- ambridge University Press, | | | | | |
| Course language: Slovak, English | | | | | | | | |
| Notes: | | | | | | | | |
| Course assessment Total number of asse | ssed student | s: 11 | | | | | | |
| abs | abs n z | | | | | | | |
| 100.0 | 100.0 0.0 0.0 | | | | | | | |
| Provides: | | | | | | | | |
| Date of last modifica | ntion: 26.09. | 2017 | | | | | | |
| Approved: prof. RN | Dr. Michal J | aščur, CSc. | | | | | | |
| | | | | | | | | |

| University: P. J. Šafá | rik University in Košice |
|--|--|
| Faculty: Faculty of S | cience |
| Course ID: ÚTVŠ/ KP/12 | Course name: Survival Course |
| Course type, scope a Course type: Practic Recommended cour Per week: Per stud Course method: cor | nd the method: ce rse-load (hours): y period: 36s mbined, present |
| Number of ECTS cr | edits: 2 |
| Recommended seme | ster/trimester of the course: |
| Course level: I., II. | |
| Prerequisities: | |
| Conditions for cours Conditions for course Attendance Final assessment: cor | e completion: completion: ntinuous fulfilment of all tasks within the course |
| Learning outcomes: Learning outcomes: Students will be far conditions as they wi and demanding situa course develops team require overcoming o | niliarized with principles of safe stay and movement in extreme natural ll obtain theoretical knowledge and practical skills to solve the extraordinary tions connected with survival and minimization of damage to health. The n work and students will learn how to manage and face the situations that f obstacles. |
| Brief outline of the c Brief outline of the c Lectures: 1. Principles of behave 2. Preparation and leat 3. Objective and subjing 4. Principles of hygiener 4. Exercises: 1. Movement in terration of imp 3. Water treatment and | ourse: burse: viour and safety for movement and stay in unknown mountains adership of tour ective danger in mountains ne and prevention of damage to health in extreme conditions in, orientation and navigation in terrain (compasses, GPS) rovised overnight stay d food preparation. |
| Recommended litera | ture: |
| Course language: | |
| Notes: | |
| | |

| Course assessment Total number of assessed students: 393 | | | | | |
|---|-------|--|--|--|--|
| abs n | | | | | |
| 44.53 | 55.47 | | | | |
| Provides: MUDr. Peter Dombrovský, Mgr. Marek Valanský | | | | | |
| Date of last modification: 15.03.2019 | | | | | |
| Approved: prof. RNDr. Michal Jaščur, CSc. | | | | | |

| University: P. J | . Šafárik Univers | ity in Košice | | | | | | |
|--|---|-----------------------|--------------|--|--|--|--|--|
| Faculty: Facult | y of Science | | | | | | | |
| Course ID: KPPaPZ/UPR/0 | Course ID: KPPaPZ/UPR/03Course name: The Art of Aiding by Verbal Exchange | | | | | | | |
| Course type, sc Course type: I Recommended Per week: 2 Pe Course metho | ope and the met Practice d course-load (h er study period: d: present | thod: ours): 28 | | | | | | |
| Number of EC | TS credits: 2 | | | | | | | |
| Recommended | semester/trimes | ster of the cours | e: 4. | | | | | |
| Course level: II | - - | | | | | | | |
| Prerequisities: | | | | | | | | |
| Conditions for | course completi | on: | | | | | | |
| Learning outco | omes: | | | | | | | |
| Brief outline of | the course: | | | | | | | |
| Recommended | literature: | | | | | | | |
| Course languag | ge: | | | | | | | |
| Notes: | | | | | | | | |
| Course assessment Total number of assessed students: 49 | | | | | | | | |
| А | A B C D E FX | | | | | | | |
| 85.71 | 85.71 4.08 2.04 2.04 2.04 4.08 | | | | | | | |
| Provides: Mgr. Ondrej Kalina, PhD. | | | | | | | | |
| Date of last mo | dification: 18.03 | 3.2019 | | | | | | |
| Approved: prof. RNDr. Michal Jaščur, CSc. | | | | | | | | |

| University: P. J. | . Šafárik Uni | versity in Košice | | | | |
|--|--|--|---|---|---|--|
| Faculty: Faculty | y of Science | | | | | |
| Course ID: ÚF TAF1/13 | Course ID: ÚFV/ Course name: Theoretical Astrophysics I IAF1/13 | | | | | |
| Course type, sc Course type: I Recommended Per week: 3 / 1 Course metho | ope and the Lecture / Prace d course-load l Per study I d: present | method: etice 1 (hours): period: 42 / 14 | | | | |
| Number of EC | FS credits: 6 | | | | | |
| Recommended | semester/tri | mester of the cours | se: 1. | | | |
| Course level: II | • | | | | | |
| Prerequisities: | | | | | | |
| Conditions for 2 written exams points is require Oral exam with | course comp s in the scope ed for continu preparation; | e of problems solved ous assessment. 3 questions within t | l during the cours | e. More than hal | If the number of ne course. | |
| Learning outco Become acquair | mes: nted with kno | owledge about the st | ructure and evolu | tion of stars. | | |
| Brief outline of Properties of the sources of energy | the course: the stellar mate the stellar stars; the | ter; the basic equat e origin, evolution a | ions of stellar str and final evolution | ructure and the nary stages of sta | models of stars; ars. | |
| Recommended 1. Böhm-Vitten Cambridge Uni 2. Kipenhahn, F 3. Hansen, C.J., Springer-Verlag | literature: se, E., Introd versity Press R., Weigert, A Kawaler, S.J g, New York, | uction to Stellar Ast Cambridge, 1989; , Stellar Structure a D., Stellar Interiors - 1994; | rophysics III, Ste and evolution, Sp - Physical Princip | llar Structure and ringer-Verlag, Bo bles, Structure an | d evolution, erlin, 1990; id Evolution, | |
| Course languag Slovak, English | ge: | | | | | |
| Notes: | | | | | | |
| Course assessm Total number of | Course assessment Total number of assessed students: 14 | | | | | |
| А | В | C | D | Е | FX | |
| 57.14 | 21.43 | 7.14 | 14.29 | 0.0 | 0.0 | |
| Provides: doc. 1 | RNDr. Rudol | f Gális, PhD. | | | | |
| Date of last mo | dification: 2 | 6.09.2017 | | | | |
| Approved: prof | . RNDr. Mic | nal Jaščur, CSc. | | | | |

| University: P. J. Šafárik University in Košice | | | | | | | | |
|--|---|--|--|---|---|--|--|--|
| Faculty: Facult | y of Science | | | | | | | |
| Course ID: ÚF TAF2/13 | Course ID: ÚFV/ TAF2/13Course name: Theoretical Astrophysics II | | | | | | | |
| Course type, scope and the method: Course type: Lecture / Practice Recommended course-load (hours): Per week: 3 / 1 Per study period: 42 / 14 Course method: present | | | | | | | | |
| Number of EC | TS credits: 6 | | | | | | | |
| Recommended | semester/trime | ster of the cours | e: 2. | | | | | |
| Course level: II | - | | | | | | | |
| Prerequisities: | | | | | | | | |
| Conditions for Due to Covid-1 1. Preparation of notes to the lect 2. Oral exam w Learning outco Become acquai Brief outline of Basic concepts Continuous abs of spectral lines Recommended 1. Tennyson, J., | course complet 9 adapted to car of own notes on t turer in electroni ithin the curricul omes: nted with the bas 7 the course: of physics of s forption coefficies literature: Astronomical s | ion: ry out distance lea the topics covered c form (scan / ph dum of the course sics of spectra for tellar atmosphere ent; model of pho pectroscopy, Imp | arning: on the basis of p oto). using electronic mation in stellar es; energy trans otosphere. Line a erial College Pre | provided study ma c facilities (Skype r atmospheres. fer by radiation absorption coeffic ess, London, 2005 | aterials. Sending //Hangouts). and convection. cient. Properties | | | |
| Gray, D.F., The observation and analysis of stellar photospheres, Cambridge University Press, Cambridge, 1992; Böhm-Vitense, E., Introduction to stellar astrophysics II, Stellar atmospheres, Cambridge University Press, Cambridge, 1997; | | | | | | | | |
| Course languag Slovak, English | ge: | | | | | | | |
| Notes: | | | | | | | | |
| Course assessment Total number of assessed students: 10 | | | | | | | | |
| А | В | C | D | Е | FX | | | |
| 60.0 | 40.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | |
| Provides: doc.] | RNDr. Rudolf G | ális, PhD. | | <u>.</u> | | | | |
| Date of last mo | dification: 28.0 | 3.2020 | | | | | | |
| | | | | | | | | |

Approved: prof. RNDr. Michal Jaščur, CSc.

| University: P. J | . Šafárik Univers | ity in Košice | | | | | | |
|---|---|-------------------|----|---|----|--|--|--|
| Faculty: Facult | y of Science | | | | | | | |
| Course ID: ÚF MSSTF/14 | Course ID: ÚFV/ MSSTF/14Course name: Theoretical Physics | | | | | | | |
| Course type, sc Course type: Recommended Per week: Per Course metho | cope and the met d course-load (h r study period: d: present | thod: ours): | | | | | | |
| Number of EC | 1 S credits: 4 | | | | | | | |
| Recommended | semester/trimes | ster of the cours | e: | | | | | |
| Course level: II | | | | | | | | |
| Prerequisities: | | | | | | | | |
| Conditions for | course completi | on: | | | | | | |
| Learning outco | omes: | | | | | | | |
| Brief outline of | the course: | | | | | | | |
| Recommended | literature: | | | | | | | |
| Course languag | ge: | | | | | | | |
| Notes: | | | | | | | | |
| Course assessment Total number of assessed students: 11 | | | | | | | | |
| А | В | С | D | Е | FX | | | |
| 63.64 | 63.64 9.09 18.18 9.09 0.0 0.0 | | | | | | | |
| Provides: | | | | | | | | |
| Date of last mo | Date of last modification: 03.05.2016 | | | | | | | |
| Approved: prof. RNDr. Michal Jaščur, CSc. | | | | | | | | |

| University: P. J. Šafárik University in Košice | | | | | | | | |
|---|--|-------------------|--------------|------|-----|--|--|--|
| Faculty: Faculty of Science | | | | | | | | |
| Course ID: ÚFV TKL1/99 | ID: ÚFV/ Course name: Theory of Condensed Matter | | | | | | | |
| Course type, scope and the method: Course type: Lecture / Practice Recommended course-load (hours): Per week: 4 / 2 Per study period: 56 / 28 Course method: present | | | | | | | | |
| Number of ECT | S credits: 8 | | | | | | | |
| Recommended | semester/trimes | ster of the cours | e: 1. | | | | | |
| Course level: II. | | | | | | | | |
| Prerequisities: | | | | | | | | |
| Conditions for of Successful passi | course completiing of the final o | on: ral exam. | | | | | | |
| Learning outcomes: To manage basic methods of quasiparticle formalism of Solid State Physics (electrons, phonons, electron-electron electron-phonon interactions, magnons) | | | | | | | | |
| Brief outline of the course: Born-Openheimer and Hartree-Fock aproximatins. The structure of solids and its theoretical description. The ideal crystal, direct and recipcal lattice. Brawaiss elementary cell. Electron in a periodic potential field, Bloch's theorem. Born-Karmán boundary conditions, Brillouin zones. Nearly free electron theory. Tight binding approximation. Existence of energy bands. Effective mass tensor. Lattice waves. Dynamical matrix. Linear monoatomic and diatomic lattices. Acoustic and optical modes. Phonons in solids. Electron-phonon interactions. The Fröhlich Hamiltonian. The atractive interaction between electrons. | | | | | | | | |
| Recommended literature: [1.] Ch. Kittel: Quantum Theory of Solids, John Wiley & Sons Inc, 1985. [2.] N.W. Ashcroft, N.D. Mermin: Solid State Physics, Harcourt College Publishers, 1976. [3.] P.L. Taylor: A Quantum Approach to the Solid State, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1970. [4.] J.M. Ziman, Principles of the Theory of Solids, University Press, Cambridge, 1972. [5.] A.O.E. Animalu, Intermediate Quantum Theory of Crystalline Solids, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1981. | | | | | | | | |
| Course languag | e: | | | | | | | |
| Notes: | | | | | | | | |
| Course assessm Total number of | ent `assessed studen | ts: 99 | | | | | | |
| A | В | С | D | E | FX | | | |
| 57.58 | 11.11 | 16.16 | 7.07 | 8.08 | 0.0 | | | |

Provides: prof. RNDr. Michal Jaščur, CSc.

Date of last modification: 03.05.2015

Approved: prof. RNDr. Michal Jaščur, CSc.

| University: P. J. Šafán | rik University in Košice | | | | | | |
|---|---|--|--|--|--|--|--|
| Faculty: Faculty of Science | | | | | | | |
| Course ID: ÚFV/ TRANS/18 | Course name: Transport properties of solids | | | | | | |
| Course type, scope an Course type: Lectur Recommended cour Per week: 2 / 1 Per Course method: pre | nd the method: e / Practice rse-load (hours): study period: 28 / 14 esent | | | | | | |
| Number of ECTS cro | edits: 4 | | | | | | |
| Recommended seme | ster/trimester of the course: 2., 4. | | | | | | |
| Course level: II. | | | | | | | |
| Prerequisities: | | | | | | | |
| Conditions for cours | e completion: | | | | | | |
| Learning outcomes: | | | | | | | |
| Electron gas, electric response, Electronic condutor, Landauer fo blockade, Quantum Anomalous Hall effect | and heat currents, Diffusive transport, Transport Boltzmann equation, Linear transport in mesoscopic systems, Ballistic transport, Resistance of ballistic formula and its applications, Quantum Hall effects, Tunneling and Coulomb dots, Single molecule transport, STEM basics, Spin polarized transport, et, Berry curvature | | | | | | |
| Recommended litera 1. K. Hirose, N. Koba Publishing 2014 2. D. K. Ferry, An Int Publishing 2018 3. M. Galperin, Quan 4. S. Datta, Electronic 5. T. Heinzel, Mesosc 6. N. W. Ashcroft, N. 7. M. P. Marder, Conc 8. J. B. Ketterson, Th 9. J. Sólyom, Fundam 2009 | ture: ayashi, Quantum Transport Calculations for Nanosystems, Pan Standford roduction to Quantum Transport in Semiconductors, Pan Standford tum Transport, Lecture Notes 1998 c Transport in Mesoscopic Systems, Cambridge University Press 1995 copic Electronics in Solid State Nanostructures, Wiley-VCH 2003 D. Mermin, Solid State Physics, Harcourt College Publisher 1976 densed Matter Physics, Wiley 2010 e Physics of Solids, Oxford University Press 2016 nentals of the Physics of Solids, Volume 2 – Electronic Properties, Springer | | | | | | |
| Course language: | | | | | | | |
| Notes: https://ktfa.science.up | ojs.sk/people/martin-gmitra/teaching/transport-properties-in-solid-state/ | | | | | | |

| Course assessment Total number of assessed students: 9 | | | | | | | |
|---|-------|-------|-------|-------|-----|--|--|
| A B C D E FX | | | | | | | |
| 33.33 | 11.11 | 22.22 | 22.22 | 11.11 | 0.0 | | |
| Provides: RNDr. Martin Gmitra, PhD. | | | | | | | |
| Date of last modification: 07.05.2020 | | | | | | | |
| Approved: prof. RNDr. Michal Jaščur, CSc. | | | | | | | |

| University: P. J. Šafá | irik University in Košice | | | | | |
|--|--|--|--|--|--|--|
| Faculty: Faculty of S | Science | | | | | |
| Course ID: ÚFV/ PHD/17 | Course name: Variable and binary stars | | | | | |
| Course type, scope a Course type: Lectu Recommended cou Per week: 3 / 1 Per Course method: pro | and the method: re / Practice rse-load (hours): study period: 42 / 14 esent | | | | | |
| Number of ECTS cr | redits: 6 | | | | | |
| Recommended seme | ester/trimester of the course: 1. | | | | | |
| Course level: II. | | | | | | |
| Prerequisities: | | | | | | |
| Conditions for cours 2 tests during term. examination and test | se completion: Each test for 15 points. Minimal amounts of points for an exam is 20. Oral | | | | | |
| Learning outcomes: Acquaint students w as well as give intro velocities. | with properties of variable stars, their distribution and basic characteristics, duction to binaries, their observations and analysis of light curve and radial | | | | | |
| Brief outline of the o Definition of variab variations. Classifica Two body problem a binaries. Period chan | course: le stars and historical review, searching for variability and periodicity of ation of variable stars and basic parameters. Visual and spectroscopic binaries. nd orbital parameters. Roche model, mass exchange in binaries and eclipsing ages. | | | | | |
| Recommended litera 1. Egglecton: 2006: 1 Press 2. Hilditch: 2001, Cl 3. Kallrath J., Milona 4. Lena et al.: 1996, 6 5. Roth G.: 1994, Co 6. Sterken a Jashek, 7. Warner: 1995, Cat | ature: Evolutionary Processes in Binary and Multiple Stars, Cambridge University ose binaries, Cambridge University Press e E.F.: 2009, Eclipsing Binary Stars - Modeling and Analysis, Springer Observational Astrophysics, Springer-Verlag ompendium of Practical Astronomy, Springer-Verlag 1996, Light Curves of variable Stars, Cambridge University Press caclysmic Variables, Cambridge University Press | | | | | |
| Course language: Slovak, English | | | | | | |
| Notes: | | | | | | |

| Course assessment Total number of assessed students: 7 | | | | | | | | | |
|---|-------|-----|-----|-----|-----|--|--|--|--|
| А | В | С | D | Е | FX | | | | |
| 57.14 | 42.86 | 0.0 | 0.0 | 0.0 | 0.0 | | | | |
| Provides: doc. Mgr. Štefan Parimucha, PhD. | | | | | | | | | |
| Date of last modification: 26.09.2017 | | | | | | | | | |
| Approved: prof. RNDr. Michal Jaščur, CSc. | | | | | | | | | |

| University: P. J. Šafárik University in Košice | | | | | | | | | |
|---|---|-------------------|--------------|-----|-----|--|--|--|--|
| Faculty: Faculty of Science | | | | | | | | | |
| Course ID: ÚFV/ UEM/17 | Course name: Úvod do exaktne riešiteľných modelov štatistickej fyziky | | | | | | | | |
| Course type, scope and the method: Course type: Lecture / Practice Recommended course-load (hours): Per week: 2 / 1 Per study period: 28 / 14 Course method: present | | | | | | | | | |
| Number of ECTS credits: 5 | | | | | | | | | |
| Recommended ser | nester/trimes | ter of the course | :: 4. | | | | | | |
| Course level: II. | | | | | | | | | |
| Prerequisities: | | | | | | | | | |
| Conditions for cou | irse completio | on: | | | | | | | |
| Learning outcome | es: | | | | | | | | |
| Exact solution for one-dimensional Ising models. combinatorial approach and transfer-matrix methods. Rigorous solution of the Ising model on Bethe lattices within exact recursion relations. Exact solution for one-dimensional classical Heisenberg model. Exact solutions for geometrically frustrated quantum Heisenberg models with the help of lattice-gas models, theory of localized magnons. Exact solutions for "six-vertex" and "eight-vertex" models, their equivalence with the Ising model. Recommended literature: Recommended literature: R. J. Baxter, Exactly Solved Models in Statistical Mechanics (Academic, New York, 1982). F. Y. Wu, Exactly Solvable Models: A Journey in Statistical Mechanics (World Scientific, Singapore, 2008). J. Strečka, Exactly Solvable Models in Statistical Physics, supportive textbook, (ESE 2005/NP1-051 11230100466 Kočice 2008). | | | | | | | | | |
| Course language: | | | | | | | | | |
| Notes: | | | | | | | | | |
| Course assessment Total number of assessed students: 3 | | | | | | | | | |
| A | В | С | D | E | FX | | | | |
| 33.33 | 66.67 | 0.0 | 0.0 | 0.0 | 0.0 | | | | |
| Provides: doc. RNDr. Jozef Strečka, PhD. | | | | | | | | | |
| Date of last modification: 26.09.2017 | | | | | | | | | |
| Approved: prof. R | NDr. Michal J | aščur, CSc. | | | | | | | |