COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: KFaDF/AFS/05	**Course name:** Antique 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 credits: 2

Recommended semester/trimester of the course: 2.

Course level: I., II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 30

A	B	C	D	E	FX
83.33	6.67	6.67	0.0	3.33	0.0

Provides: doc. PhDr. Pavol Tholt, PhD., mim.prof., Doc. PhDr. Peter Nezník, CSc.

Date of last modification: 26.01.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/APR/13	**Course name:** Astronomical Instruments

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 credits: 5

Recommended semester/trimester of the course: 1.

Course level: II.

Prerequisities:

Conditions for course completion:
2 tests during term. Each test for 15 points. Minimal amounts of points for an exam is 20.
Oral examination and test.

Learning outcomes:
Acquaint students with construction of astronomical telescopes, correction of optica errors and light detectors in different spectral regions.

Brief outline of the course:
Principles of geometrical optics, optical errors and their corrections, types of telescopes and their construction, radio-telescopes, satellite UV and X-ray telescopes, detectors of the light: CCD, CMOS, principles of photometry, spectroscopy and polarimetry.

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
Total number of assessed students: 1

A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0

Provides: doc. Mgr. Štefan Parimucha, PhD.

Date of last modification: 31.01.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ MSSAA/14	**Course name:** Astronomy and Astrophysics
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of credits: 4	
Recommended semester/trimester of the course:	
Course level: II.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment

Total number of assessed students: 0

A	B	C	D	E	FX
0.0	0.0	0.0	0.0	0.0	0.0

Provides:
Date of last modification: 14.02.2014
Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ ARE1a/99	**Course name:** Automatization of Physical Experiments

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 credits: 3

Recommended semester/trimester of the course: 1.

Course level: II.

Prerequisities:

Conditions for course completion:
2 tests during semester
Exam, according to the topics of the lectures.

Learning outcomes:
Design of automated setups for performing selected types of physical measurements. Discussion of properties of measuring and controlling subsystem.

Brief outline of the course:
Structure of systems of automated measurement and control. Characterization of instrumentation equiped with microcomputer. Sensors of physical quantities, principle of operation, technical realization of selected types of sensors. Elements for processing signal from sensors. Electronic regulators, software simulation of analog regulators. Standart communication protocols CAMAC, IEEE488, RS232. Universal microprocessors and microcomputers. Digital signal processing. Design of digital filters.

Recommended literature:
J. Uffenbeck, Microcomputers and microprocessors, Prentice Hall, 1985.
P. Horowitz, W. Hill, The Art of Electronics, Cambridge University Press 1989.

Course language:
slovak, english

Notes:

Course assessment
Total number of assessed students: 38

A	B	C	D	E	FX
44.74	28.95	13.16	10.53	2.63	0.0

Provides: RNDr. Erik Čižmár, PhD., prof. Ing. Martin Orendáč, CSc.

Date of last modification: 18.02.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ ARE1b/99	**Course name:** Automatization of Physical Experiments

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 credits: 3

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities: ÚFV/ARE1a/99

Conditions for course completion:
Evaluation of results reached during solving given tasks.
Final evaluation of the obtained results.

Learning outcomes:
Obtaining practical skills in programing automated experimental setups. Extension of knowledge about properties of non-ideal digital to analog and analog to digital converters. Obtaining skills in practical programming of model experimental setups designed for investigation of thermodynamic properties of solids as well as in design of digital filters. A student will also become familiar with handling selected automatedl setups designed for experimental studying solids.

Brief outline of the course:
Temperature controller. Nonlinearity of digital - analog and analog -digital converters. Analog - digital converter with feedback. Study of heat flow in materials with low thermal conductivity. Digital filtering of signal. Controlling step motor. Adressing selected problems in automated experimental setups in the laboratories in Department of Condensed Matter Physics.

Recommended literature:
Supporting material is available.

Course language:
slovak, english

Notes:

Course assessment
Total number of assessed students: 18

A	B	C	D	E	FX
61.11	22.22	16.67	0.0	0.0	0.0

Provides: prof. Ing. Martin Orendáč, CSc.

Date of last modification: 18.02.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ BSIM1/03	**Course name:** Biomolecular Simulations

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 credits: 6

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:
Elaboration and presentation of the project on given actual subject.
Development of own computer programs on project given at the exercises.
Exam.

Learning outcomes:
Introduction to actual problematics of biomolecular simulations.

Brief outline of the course:
Structural characteristics of biological polymers. Foldamers. Central dogma of molecular biology as flow of biological information. 3D-structure and function of foldamers. Recent view on enzyme mechanisms. Experimental methods of structure determination and their limitations. Empirical force fields and methods of classical molecular dynamics. Molecular dynamics and Monte Carlo methods - algorithms and paralelization. Ab initio molecular dynamics and hybrid approaches. Computational challenges in biomolecular simulations - simulations of chemical reactions, free energy evaluation, protein folding. Computational complexity, nontraditional approaches and heuristic approaches.

Recommended literature:
Actual literature recommended by lecturer.

Course language:

Notes:

Course assessment
Total number of assessed students: 33

A	B	C	D	E	FX
75.76	9.09	12.12	0.0	3.03	0.0

Provides: doc. RNDr. Jozef Uličný, CSc.

Date of last modification: 10.02.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ NME1/13	**Course name:** Celestial Mechanics I

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 credits: 5

Recommended semester/trimester of the course: 1.

Course level: II.

Prerequisities:

Conditions for course completion:
2 tests in the range of calculated examples on the exercises each for 10 point. Minimal amounts of points for an exam is 10.
Oral exam

Learning outcomes:
Acquaint students with foundations of the celestial mechanics, solution of two body problem and its application to bodies of the Solar system.

Brief outline of the course:
Problem of two bodies; Kepler's laws; shape of orbit; position of body in orbit; velocity of body in orbit; Kepler's equation; elements of orbit; transformation of coordinates; determination of ephemeris; description of orbits of Solar system bodies.

Recommended literature:
1. Andrle P., Základy nebeské mechaniky. Academia, Praha, 1971
2. Brouwer D., Clemence G. M.: Methods of Celestial Mechanics, Academia Press, New York and London, 1961
3. Roy A. E., Orbital Motion, Adam Hilger Ltd., Bristol, 1978
4. Vanýsek V., Základy astronomie a astrofyziky, Academia, Praha, 1980.

Course language:
Slovak, English

Notes:

Course assessment
Total number of assessed students: 1

A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0

Provides: doc. Mgr. Štefan Parimucha, PhD.

Date of last modification: 31.01.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ NME2/13	**Course name:** Celestial Mechanics 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 credits: 5

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities: ÚFV/NME1/13

Conditions for course completion:
solution of selected problems (exercises)
Exam

Learning outcomes:
The students gain the basic knowledge to be able to solve the celestial-mechanics problems of interaction between three and more bodies, or a body, which moves in a central, spherically symmetric potential (e.g. the potential of the Sun) is perturbed by another agent or agents. In other words, the sudents learn to perform a numerical integration of orbits of "n" bodies.

Brief outline of the course:
I. Equations of motion for "n" material bodies, II. Restricted three-body problem, equations in the non-rotating frame, equations in the rotating coordinate frame, Jacobi integral, surfaces and curves of zero velocity (Hill surfaces), Lagrange libration points, Tisserand criterion III. Numerical integration of orbits, perturbation function, Evarhart's integrator GAUSS-RADAU (RA15), symplectic "Leap-frog" integrator. IV. Method of variation of constants, Langrange brackets, Whittaker method of the detemination of Lagrange brackets, Lagrange equations, Lagrange equations for canonical elements, Gauss form of the Lagrange equations.

Recommended literature:
Puankare A.: Lekcii po nebesnoj mechanike. Nauka, Moskva, 1965.
Andrle P.: Základy nebeské mechaniky. Academia, Praha, 1971.
Boccaletti D., Pucacco G.: Theory of Orbits (Vol. 1 and Vol. 2), Springer, Berlin, 2001.
Brouwer D., Clemence G.M.: Methods of Celestial Mechanics. Academia Press, New York and London, 1961.
Brauer D., Klemens Dž.: Metody nebesnoj mechaniki. Mir, Moskva, 1964.
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.
Roy A.E.: Orbital Motion. Adam Hilger Ltd., Bristol, 1978.
Roj A.: Dviženije po orbitam. Mir, Moskva, 1981.

Course language:

Slovak, English

Notes:

Course assessment
Total number of assessed students: 1

A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0

Provides: RNDr. Ľuboš Neslusan, CSc.

Date of last modification: 31.01.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: KPPaPZ/KK/07	**Course name:** Communication and Cooperation
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 credits: 2	
Recommended semester/trimester of the course: 3.	
Course level: II.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
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.
Date of last modification: 04.02.2014
Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ PAST/05	**Course name:** Computational Astrophysics

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 credits: 3

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:
Software project and its presentation.
Oral examination

Learning outcomes:
Inform students of astronomy as well as other interested people about basic numerical methods used in astronomy and astrophysics, give them basic informations about problems of scientific writting and basic work with astronomical packages

Brief outline of the course:
Introduction to LaTex system., Sources of astronomical informations on web, VIZIER, NASA ADS Abstract Service. FITS format of astronomical data. Reduction of CCD and photoelectric photometry Introduction to MIDAS and IRAF. Numerical procedures for JD computation, stellar time, air mass, reduction of precession, nutation, aberation, refraction and proper motion. Heliocentric and barycentric correction of time and velocity. Period determination in astronomical data. Transformation of photometric systems and calibration of spectra. Minima times determinations.

Recommended literature:
1. Ghedini: 1982, Software for Photometric astronomy
2. Press et al., 1992, Numerical Recipes in C, The art of scientific Computing, CUP
3. manual for software packages
4. published papers and internet sources

Course language:
Slovak, English

Notes:

Course assessment
Total number of assessed students: 18

A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0

Provides: doc. Mgr. Štefan Parimucha, PhD.
Date of last modification: 31.01.2014
Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of 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 credits: 4

Recommended semester/trimester of the course: 1.

Course level: I., II.

Prerequisities:

Conditions for course completion:
Continuous evaluation is based on students' activity in the classroom and work on assignments. Examination and assignments submitted electronically with the attached computer code.

Learning outcomes:
To teach students to create simulation projects to help to solve physical problems.

Brief outline of the course:
Advanced methods of Monte Carlo (MC) simulations of lattice spin systems. Local and cluster perturbation algorithms. Errors and histogram analysis of MC data. Reweighting by simple histogram and multihistogram methods. Multicanonical methods. Simulated and parallel tempering. Universality and finite-size scaling. Determination of order of phase transitions and calculation of critical exponents. Basics of quantum MC simulations. MC simulations of stochastic proceses. Difusion equation. Stochastic proceses in financial analysis. Basics of molecular dynamics method.

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: 35

A	B	C	D	E	FX
65.71	11.43	14.29	5.71	2.86	0.0

Provides: doc. RNDr. Milan Žukovič, PhD.

Date of last modification: 31.01.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ KOZM/13	**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 credits: 4

Recommended semester/trimester of the course: 3.

Course level: II.

Prerequisities:

Conditions for course completion:
Test; seminar paper.
Oral exam with preparation; 3 questions within the curriculum presented during the course.

Learning outcomes:
Become acquainted with basic knowledge about fundamental cosmological theories, the structure and evolution of the universe.

Brief outline of the course:
Structure and distribution of matter in the universe. Historical development of cosmological theories; Olbers' paradox; gravitational paradox. General theory of relativity; relativistic cosmology; other cosmological theories. The origin and evolution of the universe; cosmological problems.

Recommended literature:
1. Contopoulos, D. Kotsakis, Cosmology, the structure and evolution of the Universe, Springer, 1984
2. Weinberg, S., Gravitation and Cosmology, Wiley, New York, 1971
3. Narlikar, J.V., An Introduction to Cosmology, Cambridge University Press, Cambridge, 2002

Course language:
Slovak, English

Notes:

Course assessment
Total number of assessed students: 2

A	B	C	D	E	FX
50.0	0.0	50.0	0.0	0.0	0.0

Provides: doc. RNDr. Rudolf Gális, PhD.

Date of last modification: 31.01.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ODP/14	**Course name:** Diploma Thesis and its Defence

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: present

Number of credits: 20

Recommended semester/trimester of the course:

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 8

A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0

Provides:

Date of last modification: 10.03.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ EKF/04	**Course name:** Econophysics
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 credits: 4	
Recommended semester/trimester of the course: 3.	
Course level: II.	
Prerequisities:	
Conditions for course completion: Continuous evaluation is based on students' activity in the classroom and work on assignments. Examination	
Learning outcomes: To teach student to employ the aquired knowledge from physics in different disciplines such as economy and sociology.	
Brief outline of the course: Introduction. Pareto and Bachelier approach. The physical "philosophy" in the formulation of models of social and economic models. The system of measurable quantities in economy, the logarithmic price, the uints of time and price in economy. The stochastic models, random processess and distribution functions, stability of distributions, infinitely divisible process, scaling of distribution functions, Gauss and Lévy distribution, the simulation of random processes via computer. Selected parallels between economy and fluid turbulence, market volatility and intermittence. Correlations of markets, the markets in mutual correlations and anticorrelations. Autocorrelations and analysis of time series. Portfolio taxonomy and the strategy of the joining of enterprises and formation of corporations. Computer modeling of GARCH and ARCH random processes with variable dispersion of volatility. Models based on the stochastic diferential equations, Black-Scholes model of the rational option price.	
Recommended literature: 1. An Introduction to Econophysics: Correlations and Complexity in Finance, R. N. Mantegna, H. E. Stanley, Cambridge University Press 2000. 2. The Statistical Mechanics of Financial Markets, J. Voit, Springer 2003. 3. Econophysics: An Introduction, Sitabhra Sinha, A. Chatterjee, A. Chakraborti, B. K. Chakrabarti, Wiley VCH 2011.	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 13

A	B	C	D	E	FX
69.23	23.08	7.69	0.0	0.0	0.0

Provides: doc. RNDr. Milan Žukovič, PhD.

Date of last modification: 31.01.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ESP1/13	**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 credits: 3

Recommended semester/trimester of the course: 3.

Course level: II.

Prerequisities:

Conditions for course completion:
semestral essay
oral exam

Learning outcomes:
Acquaint students wit problematic of exoplanets, their detections, formation and properties.

Brief outline of the course:
Definition of planets and exoplanets, known exoplanets, methods of their detection, protostelar disks and formations of planets, creation of giant planets and their dynamics in systems.

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
6. Perryman, M.: 2011, The Exoplanet Handbook, Cambridge University Press

Course language:
Slovak, English

Notes:

Course assessment
Total number of assessed students: 1

A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0

Provides: doc. Mgr. Štefan Parimucha, PhD.

Date of last modification: 31.01.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚINF/FUN1/14	**Course name:** Functional programming

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 credits: 4

Recommended semester/trimester of the course: 1.

Course level: I., II.

Prerequisities: ÚINF/PAZ1c/03

Conditions for course completion:

Learning outcomes:
To learn bases of declarative programming (as complementary method to procedural programming) and basic methods of implementations of functional programming languages.

Brief outline of the course:
Principles of functional programming. Lambda calculus from the functional programming languages point of view. Properties of functional programming languages. Programming language Haskell: the structure of the language and basic computational rule, basic data types, lists, recursion and induction, trees

Recommended literature:
BIRD, R., WADLER, P.: Introduction to Functional Programming. Prentice Hall International, 1988.
LIPOVAČA, M.: Learn You Haskell for Great Good!. Free from http://learnyouahaskell.com/

Course language:

Notes:

Course assessment
Total number of assessed students: 4

A	B	C	D	E	FX
75.0	25.0	0.0	0.0	0.0	0.0

Provides: doc. Ing. Štefánia Gallová, CSc.

Date of last modification: 25.02.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ GEA1/13	**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 credits: 5

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities: ÚFV/TAF1/13

Conditions for course completion:
Seminar essay
Oral exam

Learning outcomes:
Acquaint students with the structure of our Galaxy, stellar streams and stellar statistics, galactic neighborhood, division of galaxies, their dynamic and evolution.

Brief outline of the course:
Determination of distances of the universe. Movement of the stars in Galaxy and Solar neighbouhood. Movement os the Sun in space. Stelar statistics. Structure of the Galaxy, subsystems, populations of the stars and spiral structure. Galaxies in universe, classification. Local group of galaxies, clusters of galaxies. Evolution of galaxies and large scale structure

Recommended literature:
1. Bertin a Lin: 1996, Spiral Structure in Galaxies, The MIT Press.
2. Combes et al.: 2003, Galaxies and Cosmology, Springer, Berlin
3. Harwitt: 1998, Astrophysical Concepts, Springer, Berlin
4. Mihalas: 1968, Galactic Astronomy, Freeman Publishing

Course language:
Slovak, English

Notes:

Course assessment
Total number of assessed students: 2

A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0

Provides: doc. Mgr. Štefan Parimucha, PhD.

Date of last modification: 31.01.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ TRV1/00	**Course name:** General Theory of Relativity

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 credits: 3

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:
In the eighth week the test of the mathematical problem.
Individual report at the end of the semester.
Oral examination.

Learning outcomes:

Brief outline of the course:
Overview of the special theory of relativity (STR). Uniformly accelerated motion in STR. Local principle of equivalence - Eotvos experiment. Tensor calculus in pseudoriemann's metric. Einstein equations of gravitational field. Schwarzschild's solution for spherically symetric field. Experimental tests of the general theory of relativity. Black holes. Solutions for homogeneous and isotropic distribution of mass. Cosmological applications.

Recommended literature:
1. Hughston, L. P., Tod K. P.: An Introduction to General Relativity, London Mathenatical 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: 70

A	B	C	D	E	FX
94.29	4.29	1.43	0.0	0.0	0.0

Provides: prof. RNDr. Andrej Bobák, DrSc., RNDr. Marián Jurčišin, PhD.

Date of last modification: 31.01.2014
Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: KFaDF/ DF2p/03	**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 credits: 4

Recommended semester/trimester of the course: 2.

Course level: I., II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 729

A	B	C	D	E	FX
60.49	13.85	12.76	8.78	3.43	0.69

Provides: doc. PhDr. Pavol Tholt, PhD., mim.prof., Doc. PhDr. Peter Nezník, CSc., PhDr. Katarína Mayerová, PhD., Mgr. Róbert Stojka, PhD.

Date of last modification: 26.01.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: KFaDF/ KDF/05	**Course 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 credits: 2

Recommended semester/trimester of the course: 2.

Course level: I., II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 10

A	B	C	D	E	FX
50.0	20.0	10.0	0.0	10.0	10.0

Provides: doc. PhDr. Pavol Tholt, PhD., mim.prof.

Date of last modification: 26.01.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: R UPJŠ/ IB10/14	**Course name:** IB10 - Medzinárodný certifikát ECo-C
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of credits: 16	
Recommended semester/trimester of the course:	
Course level: I., I.II., II.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 0

abs	n	neabs
0.0	0.0	0.0

Provides:
Date of last modification: 11.08.2014
Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: R UPJŠ/ IB11/14	**Course name:** IB11 - Medzinárodný certifikát ECDL
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of credits: 14	
Recommended semester/trimester of the course:	
Course level: I., I.II., II.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 0

abs	n	neabs
0.0	0.0	0.0

Provides:
Date of last modification: 11.08.2014
Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: R UPJŠ/ IB12/14	**Course name:** IB12 - Používanie, administrácia a vývoj v systéme SAP
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of credits: 54	
Recommended semester/trimester of the course:	
Course level: I., I.II., II.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 0

abs	n	neabs
0.0	0.0	0.0

Provides:
Date of last modification: 11.08.2014
Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: R UPJŠ/ IB1/14	**Course name:** IB1 - Etika v biomedicínskych vedách pre zdravotnícku prax
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of credits: 16	
Recommended semester/trimester of the course:	
Course level: I., I.II., II.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 0

abs	n	neabs
0.0	0.0	0.0

Provides:
Date of last modification: 11.08.2014
Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: R UPJŠ/ IB2/14	**Course name:** IB2 - Právne minimum – súkromnoprávne aspekty
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of credits: 16	
Recommended semester/trimester of the course:	
Course level: I., I.II., II.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 0

abs	n	neabs
0.0	0.0	0.0

Provides:
Date of last modification: 11.08.2014
Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: R UPJŠ/ IB3/14	**Course name:** IB3 - Právne minimum – verejnoprávne aspekty
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of credits: 16	
Recommended semester/trimester of the course:	
Course level: I., I.II., II.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 0

abs	n	neabs
0.0	0.0	0.0

Provides:
Date of last modification: 11.08.2014
Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: R UPJŠ/ IB4/14	**Course name:** IB4 - Projektový manažment
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of credits: 20	
Recommended semester/trimester of the course:	
Course level: I., I.II., II.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 0

abs	n	neabs
0.0	0.0	0.0

Provides:
Date of last modification: 11.08.2014
Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: R UPJŠ/ IB5/14	**Course name:** IB5 - Manažérska ekonomika
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of credits: 16	
Recommended semester/trimester of the course:	
Course level: I., I.II., II.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 0

abs	n	neabs
0.0	0.0	0.0

Provides:
Date of last modification: 11.08.2014
Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: R UPJŠ/ IB6/14	**Course name:** IB6 - Riešenie konfliktných a krízových situácií v školskej praxi
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of credits: 16	
Recommended semester/trimester of the course:	
Course level: I., I.II., II.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 0

abs	n	neabs
0.0	0.0	0.0

Provides:
Date of last modification: 11.08.2014
Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: R UPJŠ/ IB7/14	**Course name:** IB7 - Štatistika pre prax
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of credits: 16	
Recommended semester/trimester of the course:	
Course level: I., I.II., II.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 0

abs	n	neabs
0.0	0.0	0.0

Provides:
Date of last modification: 11.08.2014
Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: R UPJŠ/ IB8/14	**Course name:** IB8 - Environmentálne aspekty záťaže životného prostredia
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of credits: 16	
Recommended semester/trimester of the course:	
Course level: I., I.II., II.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 0

abs	n	neabs
0.0	0.0	0.0

Provides:
Date of last modification: 11.08.2014
Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: R UPJŠ/ IB9/14	**Course name:** IB9 - Medzinárodný certifikát TOEFL
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of credits: 17	
Recommended semester/trimester of the course:	
Course level: I., I.II., II.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 0

abs	n	neabs
0.0	0.0	0.0

Provides:
Date of last modification: 11.08.2014
Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: KFaDF/IH2/03	**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 credits: 2

Recommended semester/trimester of the course: 3.

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 4

A	B	C	D	E	FX
75.0	25.0	0.0	0.0	0.0	0.0

Provides: Doc. PhDr. Peter Nezník, CSc.

Date of last modification: 26.01.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ MPH1/13	**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 credits: 6

Recommended semester/trimester of the course: 3.

Course level: II.

Prerequisities:

Conditions for course completion:
test
Exam

Learning outcomes:
The knowledge on the physical and dynamic properties of asteroids, comets and meteors.

Brief outline of the course:
Asteroids, comets, meteors - discoveries, orbits, astrometry, photometry, mass, rotation and size, composition, collision with Earth, formation and evolution, space research, relationships and context.

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 language:
Slovak, English

Notes:

Course assessment
Total number of assessed students: 1

A	B	C	D	E	FX
0.0	100.0	0.0	0.0	0.0	0.0

Provides: doc. RNDr. Ján Svoreň, DrSc.

Date of last modification: 31.01.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/KVP/11	**Course name:** Introduction to Quantum Calculation

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 credits: 4

Recommended semester/trimester of the course: 4.

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 99

A	B	C	D	E	FX
50.51	25.25	17.17	4.04	3.03	0.0

Provides: doc. RNDr. Jozef Strečka, PhD.

Date of last modification: 31.01.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ MKL/03	**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 credits: 6

Recommended semester/trimester of the course: 2.

Course level: II., III.

Prerequisities:

Conditions for course completion:
Test.
Oral examination.

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: 62

A	B	C	D	E	FX	N	P
51.61	14.52	6.45	0.0	0.0	0.0	0.0	27.42

Provides: prof. RNDr. Peter Kollár, DrSc.

Date of last modification: 18.02.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚTVŠ/ NJ//13	**Course name:** Naval Yachting
Course type, scope and the method: **Course type:** Practice **Recommended course-load (hours):** **Per week:** 36 **Per study period:** 504 **Course method:** present	
Number of credits: 2	
Recommended semester/trimester of the course:	
Course level: I., II.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 2

abs	n
100.0	0.0

Provides: doc. Mgr. Rastislav Feč, PhD.
Date of last modification: 15.01.2014
Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚINF/ NEU1/03	**Course name:** Neural networks

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 credits: 5

Recommended semester/trimester of the course: 1., 3.

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:
To understand and to know using basic paradigms of neural networks.

Brief outline of the course:
Feed-forward and recurrent neural networks, back propagation algorithm to adaptation of neural networks, a capability of neural networks to be an universal approximator. Hopfield neural networks and solving optimization problems. Kohonen neural networks. Neural networks in connections to computational models. Theoretical problems of neural networks.

Recommended literature:
J. Hertz, A.Krogh, R.G. Palmer: Introduction to the theory of neural computation, Addison Wesley, 1991.
V. Kvasnička a kol.: Úvod do teórie neurónových sietí, IRIS, Bratislava, 1997.
J. Šíma, R. Neruda: Teoretické otázky neurónových sítí. Matfyzpress,MFF UK, Praha, 1996.

Course language:

Notes:

Course assessment
Total number of assessed students: 172

A	B	C	D	E	FX
12.79	14.53	22.67	23.84	20.93	5.23

Provides: doc. RNDr. Gabriela Andrejková, CSc.

Date of last modification: 03.02.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ NSF/10	**Course name:** Non-Equilibrium Statistical Physics

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 credits: 5

Recommended semester/trimester of the course: 3.

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:
To give basic knowledges about modern trends and theoretical methods in description of non-equlibrium phenomena in physics.

Brief outline of the course:
Problems of kinetic theory - formulations of basic tasks. Distribution function. Liouville theorem. Liouville operator. Kinetic Boltzman equation. H-theorem. Maxwell distribution. Transport phenomena. Conservation laws. Derivation of the macroscopic eduqtions in leading and next-to-leading approximation. Hydrodynamic approximation. Set of equations for density, mean velocity and temperature. Derivation of continuity equation, Navier-Stokes equation, heat conductivity equation. Derivation of vicosity and diffusivity coefficients from microscopic description. Stokes laws. Reynolds number. Dynamical derivation of kinetic equation. Liouville (master) equation for N-particle distribution function. Bogolyubov set of equations for distribution functions.
Principle of weakening of statistical correlations. Equation for one-particle distribution function. Brown motion. Langevin equation. Fokker-Planck equation and specific tasks.

Recommended literature:
1. Landau L.D., Lifshitz E.M.: Teoreticheskaja fizika X: Lifshitz E.M., Pitaevskij L.P.: Fizicheskaja
kinetika, Moskva, Fizmatlit 2002
2. K. Huang: Statistical mechanics, John Wiley and Sons, Inc., New York-London, 1963.
D.N.Zubarev: Neravnovesnaja statisticheskaja termodinamika, Moskva, Nauka, 1971.
A.N.Vasiliev Kvantovopolevaja renormgruppa v teorii kriticeskogo povedenija i stochasticeskoj dinamike, Sankt-Peterburg, Izd. Peters. Inst. Of. Nuclear physics (1998) 773 (The Field Theoretic Renormalization Group in Critical Behavior Theory and Stochastic Dynamics, Chapman & Hall CRS Press Company New York, 2004)

Course language:
slovak and english

Notes:

Course assessment
Total number of assessed students: 7

A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0

Provides: prof. RNDr. Michal Hnatič, DrSc., RNDr. Tomáš Lučivjanský, PhD.

Date of last modification: 31.01.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
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 credits: 5

Recommended semester/trimester of the course: 1., 3.

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 assessment
Total number of assessed students: 55

A	B	C	D	E	FX
69.09	16.36	7.27	1.82	5.45	0.0

Provides: RNDr. Branislav Brutovský, CSc.

Date of last modification: 10.02.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ NOT1b/03	**Course name:** Nontraditional Optimization Techniques II

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 credits: 5

Recommended semester/trimester of the course: 2.

Course level: I., II.

Prerequisities:

Conditions for course completion:
Presentation of the project in written form. Oral exam and discussion of the presented project.

Learning outcomes:
By using examples from the biology to learn applications of optimization techniques on study and interpretation of complex systems. Introduction to new paradigms in the area of systems biology.

Brief outline of the course:
Complex systems, emergent behavior. Evolutionary theory and memetics. Application of optimization techniques on complex systems. Application of methods /genetic algorithms, simulated annealing, taboo search/ on selected problems of biomolecular simulations. Molecular dynamics, protein folding. Population dynamics, metabolic networks and complexity in bioinformatics.

Recommended literature:
The actual scientific papers.

Course language:

Notes:

Course assessment
Total number of assessed students: 29

A	B	C	D	E	FX
86.21	6.9	3.45	3.45	0.0	0.0

Provides: doc. RNDr. Jozef Uličný, CSc.

Date of last modification: 10.02.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚINF/OSY1/11	**Course name:** Operating systems

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 credits: 4

Recommended semester/trimester of the course: 1.

Course level: I., II.

Prerequisities: ÚINF/PAZ1a/10

Conditions for course completion:
Written tests.

Learning outcomes:
The purpose of the operating systems subject is to provide the students how to organize and control hardware and software so that the device is live and behaves in a flexible but predictable way.

Brief outline of the course:
Operating systems structure and components, process, files, threads, CPU processor scheduling, schedule algorithms, interprocess communi-cations, deadlocks, synchronization, multitasking, virtualisation.

Recommended literature:
STALLINGS, W.: Operating Systems. Internal and Design Principles. Pearson, Prentice Hall, 2005.
SILBERSCHATZ, A. et al.: Operating Systems Concepts. Addison-Wesley, Reading MA, 2000.

Course language:

Notes:

Course assessment
Total number of assessed students: 102

A	B	C	D	E	FX
32.35	6.86	17.65	12.75	19.61	10.78

Provides: doc. Ing. Štefánia Gallová, CSc., RNDr. Peter Gurský, PhD.

Date of last modification: 03.02.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: Dek. PF UPJŠ/PPZ/13	**Course name:** Personality Development and Key Competences for Success on a Labour Market

Course type, scope and the method:
Course type: Practice
Recommended course-load (hours):
Per week: Per study period: 14s
Course method: present

Number of credits: 2

Recommended semester/trimester of the course: 1., 3.

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 39

A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0

Provides: RNDr. Peter Stefányi, PhD.

Date of last modification: 17.02.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ FPK1/07	**Course name:** Phase Transitions and Critical Phenomena

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 credits: 4

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:
Examination

Learning outcomes:
To acquaint students with based problems of the phase transitions and critical phenomena.

Brief outline of the course:
Thermodynamics of phase transitions. Classification of phase transitions. Critical phenomena, universality. Microscopic models of the magnetic phase transitions. Ising model in one and two dimensions. Mean field theory of the Ising model. Landau theory of phase transitions.

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 assessment
Total number of assessed students: 87

A	B	C	D	E	FX
65.52	9.2	9.2	11.49	4.6	0.0

Provides: prof. RNDr. Andrej Bobák, DrSc.

Date of last modification: 31.01.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/FJA1/99	**Course name:** Physics of the Nucleus

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 credits: 3

Recommended semester/trimester of the course: 1.

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:
Basic properties of nucleus. Nuclear masses, binding energy, nuclear stability. Nuclear radius, density distribution of nuclear matter. Nuclear momentum and parity. Spin and magnetic momentum of nuclei. Quadrupole electric momentum. Theory of deuteron. Theory of scattering. Nuclear spin and isospin. Nuclear forces. Tensor character of nuclear forces.Models of atomic nucleus.

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 36

A	B	C	D	E	FX
61.11	13.89	8.33	11.11	5.56	0.0

Provides: doc. RNDr. Jozef Urbán, CSc.

Date of last modification: 11.02.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/PRA/13	**Course name:** Practice in Astronomy

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 credits: 3

Recommended semester/trimester of the course: 1.

Course level: II.

Prerequisities: ÚFV/APR/13

Conditions for course completion:

Learning outcomes:
Acquaint students with a basic reduction of photometric observations and with astrometric determination of position of objects.

Brief outline of the course:
Photometric observations, reduction and calibration, measurements of brightness of stars. Astrometric transformation, WCS system

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: 1

A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0

Provides: Mgr. Marek Husárik, PhD.

Date of last modification: 31.01.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/PRAF/13	**Course name:** Practice in Astrophysics

Course type, scope and the method:
Course type: Practice
Recommended course-load (hours):
Per week: 4 **Per study period:** 56
Course method: present

Number of credits: 4

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities: ÚFV/TAF1/13

Conditions for course completion:
Continual valuation based on the partial fulfillment of tasks
Based on continual valuation.

Learning outcomes:
Acquaint students with a reduction of spectroscopical observations of the Sun and stellar objects.

Brief outline of the course:
Acquisition of spectra and their reduction, calibration, measurement of radial velocities and line's intensities, determination of the chemical composition of the atmosphere of the Sun and stars.

Recommended literature:
2. Appenzeller, I., Introduction to Astronomical Spectroscopy, Cambridge University Press, 2012

Course language:
Slovak, English

Notes:

Course assessment
Total number of assessed students: 1

A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0

Provides: Mgr. Julius Koza, doc. Mgr. Štefan Parimucha, PhD.

Date of last modification: 31.01.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚINF/ PAZ1a/10	**Course name:** Programming, algorithms, and complexity

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 3 / 4 **Per study period:** 42 / 56
Course method: present

Number of credits: 8

Recommended semester/trimester of the course: 1.

Course level: I., II.

Prerequisities:

Conditions for course completion:

Learning outcomes:
The course does not require having any programming experiences. The aim of the course is to teach students basics of algorithms and programming. The methodology used in the course is "object oriented programming first". The primary goal of the course is to teach students to make good programming habits and a good object-oriented design. The programming language used in the course is Java with professional IDE Eclipse.

Brief outline of the course:
First part of the course (with turtle graphics): New Eclipse project, interactive communication with objects, simple turtle graphics, making user methods, local variables, variable types, arithmetic and logical expressions, random numbers, conditions, loops for and while, debugging, references, chars, Strings, arrays, instance variables, mouse events, simple array algorithms.
Second part of the course (without turtle graphics): Exceptions, using try-catch-finally block, files and directories, conversion from string variables, encapsulation, constructors with parameters, constructors hierarchy, getters and setters, interfaces, inheritance and polymorphism, abstract classes and methods, packages, visibility modifiers, sorting using Arrays.sort() and interfaces Comparable and Comparator, Java Collections Framework: autoboxing, interface List, ArrayList, LinkedList, interface Set and class HashSet, methods equals() and hashCode(), for-each loop, interface Map and class HashMap, custom Exceptions, rethrowing exceptions, exceptions' inheritance, Runtime exceptions, Errors, static variables and methods.

Recommended literature:
ECKEL, B.: Thinking in Java, Pearson, 2006
SIERRA, K., BATES, B.: Head First Java, O'Reilly Media; 2nd edition, 2005

Course language:

Notes:

Course assessment
Total number of assessed students: 421

A	B	C	D	E	FX
15.68	7.84	12.35	15.2	12.59	36.34

Provides: RNDr. Peter Gurský, PhD., RNDr. František Galčík, PhD., PaedDr. Ján Guniš, PhD., RNDr. Zuzana Bednárová, PhD.

Date of last modification: 03.02.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚINF/ PAZ1b/03	**Course name:** Programming, algorithms, and complexity

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 2 / 4 **Per study period:** 28 / 56
Course method: present

Number of credits: 7

Recommended semester/trimester of the course: 2.

Course level: I., II.

Prerequisities: ÚINF/PAZ1a/10 or ÚFV/POF1b/99

Conditions for course completion:
Oral and practical examination.

Learning outcomes:
To understand basic principles of algorithm design (including basic data structures). To apply these principles and knowledge to solve simple algorithmic tasks efficiently.

Brief outline of the course:
Recursion, introduction to time complexity and O-notation, binary search and sorting algorithms (SelectionSort, QuickSort, MergeSort, HeapSort), basic data structures (linked list, stack, queue, trees, binary search trees) – implementation and applications, backtracking, divide and conquer, dynamic programming, greedy algorithms, basic graph algorithms (DFS, BFS, Dijkstra's algorithms, Bellman-Ford algorithm, Floyd-Warshall algorithm, topological sorting), introduction to stringology.

Recommended literature:
CORMEN, T.H., LEISERSON, Ch.E., RIVEST, R.L, STEIN, C. Introduction to Algorithms. The MIT Press, 2009.
KLEINBERG, J., TARDOS, E.: Algorithm Design, Cornell University, Addison Wesley, New York, 2006.

Course language:

Notes:

Course assessment
Total number of assessed students: 991

A	B	C	D	E	FX
11.2	6.26	9.89	20.18	24.22	28.25

Provides: RNDr. František Galčík, PhD., PaedDr. Ján Guniš, PhD., RNDr. Zuzana Bednárová, PhD., Mgr. Matej Nikorovič, doc. RNDr. Gabriela Andrejková, CSc.

Date of last modification: 03.02.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: KPPaPZ/PPZMg/12	**Course name:** Psychology and Health Psychology (Mgr. study)

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 1 / 2 **Per study period:** 14 / 28
Course method: present

Number of credits: 4

Recommended semester/trimester of the course: 2.

Course level: I., II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 221

A	B	C	D	E	FX
19.91	25.79	25.34	12.67	15.84	0.45

Provides: PhDr. Anna Janovská, PhD., PhDr. Karolína Barinková, PhD., Mgr. Lucia Hricová

Date of last modification: 04.02.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ KTP1a/03	**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 credits: 6

Recommended semester/trimester of the course: 1.

Course level: II.

Prerequisities:

Conditions for course completion:
homeworks; their presentation and common analysis of problem under consideration, exam

Learning outcomes:
To offer basic knowledges about modern trends and theoretical methods in description of microword and phenomena in physical systems with infinite degrees of freedom.

Brief outline of the course:
Conception of relativistic quantum field. Particles as quantum fluctuations of this field. Lagrange formalism. Symmetries and related conservation laws for currents. Euler-Lagrange equations. Basic fields - scalar, spinor, electromagnetic and vector. Equations for free classical fields - Klein-Gordon and Dirac equations, Maxwell equations. Lagrangeans and Hamiltonians for these fields. Quantization of free fileds. Basic commutating and anticommutating relatios for free quantum fields.

Recommended literature:
Bogoljubov N.N., Širkov D.V.: Vvedenie v teoriu kvantovannych polej, Moskva, 1957 (prvé vydanie); Moskva, Nauka 1984 (4. Vydanie).
Bjorken J.D., Drell S.D.: Relativistic quantum fields (dva diely), McGraw-Hill, New York, 1966.
Feynmann R.P.: Photon-Hadron Interactions, Benjamin,New York, 1972; ruský preklad: Vzaimodejstvije fotonov s adronami, Mir, Moskva, 1975.

Course language:
slovak and english

Notes:

Course assessment
Total number of assessed students: 43

A	B	C	D	E	FX
60.47	20.93	6.98	4.65	6.98	0.0

Provides: prof. RNDr. Michal Hnatič, DrSc., RNDr. Tomáš Lučivjanský, PhD.

Date of last modification: 11.02.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ KTP1b/03	**Course name:** Quantum Field Theory 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 credits: 6

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities: ÚFV/KTP1a/03

Conditions for course completion:
homeworks, their presentation and common analysis of the problem under consideration; exam

Learning outcomes:
To offer basic knowledges about modern trends and theoretical methods in description of microword and phenomena in physical systems with infinite degrees of freedom.

Brief outline of the course:
Interacting fields. The principle of symmetry and the form of interactions of quantum fields. Lagrange operator in QED. S – matrix. Wick theorems and Feynman diagrams. Perturbative calculation of S - matrix. S - matrix and cross section of the processes. Compton scattering of the proton on electron cross section calculation in QCD frame. Radiation corrections and the divergences of the Feynman graphs. Running coupling constant.

Recommended literature:
Bogoljubov N.N., Širkov D.V.: Vvedenie v teoriu kvantovannych polej, Moskva, 1957 (prvé vydanie); Moskva, Nauka 1984 (4. Vydanie)
Itzykon C., Zuber J.B.: Quantum field theory,McGraw-Hill, New York, 1986; ruský preklad: Icikon K., Zjuber Z.B.: Kvantovaja teoria polja,
Mir, Moskva, 1984.
Ryder L.H.: Quantum field theory, Cambridge University Press, 1985; ruský
preklad: Rajder L.: Kvantovaja teoria polja, Mir, Moskva, 1987.

Course language:
slovak and english

Notes:

Course assessment
Total number of assessed students: 40

A	B	C	D	E	FX
57.5	27.5	7.5	2.5	5.0	0.0

Provides: prof. RNDr. Michal Hnatič, DrSc., RNDr. Tomáš Lučivjanský, PhD.

Date of last modification: 11.02.2014
Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/KTM/14	**Course name:** Quantum Theory of Magnetism

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 credits: 5

Recommended semester/trimester of the course: 3.

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:
The definition of basic lattice-statistical models in the quantum theory of magnetism. The one-dimensional quantum Heisenberg model, spin waves and the grounds of Bethe-ansatz method. Valence-bond-crystal ground states of the Majumdar-Ghosh and Shastry-Sutherland models. The one-dimensional quantum XY model in a transverse magnetic field, Jordan-Wigner fermionization and quantum critical points. The spin-wave theory, bosonization and Holstein-Primakoff transformation.

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. Majlis, The Quantum Theory of Magnetism (World Scientific, Singapore, 2000).

Course language:
EN - english

Notes:

Course assessment
Total number of assessed students: 0

A	B	C	D	E	FX	N	P
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Provides: doc. RNDr. Jozef Strečka, PhD.

Date of last modification: 07.02.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚTVŠ/ ÚTVŠ/CM/13	**Course name:** Seaside Aerobic Exercise
Course type, scope and the method: **Course type:** Practice **Recommended course-load (hours):** **Per week:** 36 **Per study period:** 504 **Course method:** present	
Number of credits: 2	
Recommended semester/trimester of the course:	
Course level: I., II.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 7

abs	n
57.14	42.86

Provides: Mgr. Alena Buková, PhD., Mgr. Agata Horbacz, PhD.
Date of last modification: 15.01.2014
Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ SPTFAa/14	**Course name:** Semestral Work I

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: present

Number of credits: 2

Recommended semester/trimester of the course: 1.

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 5

A	B	C	D	E	FX
80.0	20.0	0.0	0.0	0.0	0.0

Provides:

Date of last modification: 14.02.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ SPTFAb/14	**Course name:** Semestral Work II

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: present

Number of credits: 6

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 5

A	B	C	D	E	FX
80.0	20.0	0.0	0.0	0.0	0.0

Provides:

Date of last modification: 14.02.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ SPTFAc/14	**Course name:** Semestral Work III
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of credits: 6	
Recommended semester/trimester of the course: 3.	
Course level: II.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 0

A	B	C	D	E	FX
0.0	0.0	0.0	0.0	0.0	0.0

Provides:
Date of last modification: 14.02.2014
Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: KPPaPZ/SPVKE/07	**Course name:** Social-Psychological Training of Coping with Critical Life Situations

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 credits: 2

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 101

abs	n	z
97.03	2.97	0.0

Provides:

Date of last modification: 04.02.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ FSL1/13	**Course name:** Solar Physics

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 credits: 6

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:
solved exercises
Exam

Learning outcomes:
To give students a comprehensive, physical 'up-to date' image of the sun from the deepest central area to the visible surface, solar atmosphere and the effects of the solar activity on the interplanetary space. To show an importance of the solar physics for understanding the evolution of stars and other areas of astrophysics.

Brief outline of the course:
Preliminary definitions and assumptions, basic facts about the sun, solar interior, solar atmosphere. magnetic fields and the dynamics of the Sun, The Standard Solar Model, solar activity, solar cycle.

Recommended literature:
Zirin, H., Astrophysics of the Sun, Cambridge Univ. Press, Cambridge, 1988
Physics of the Sun I. II. III. Geophysics and Astrophysics Monorgaphs, eds: P.A. Sturrock, T. E. Holzer, D.M. Mihalas, R.K. Ulrich, Riedel Publ. Dodrecht 1968
M. Stix: The Sun, An Introduction, Springer, 2nd edition, 2002.
E. R. Priest: Solar Magnetohydrodynamics, Reidel, 1982.
K. R. Lang: The Sun from Space, Springer, 2000.

Course language:
Slovak, English

Notes:

Course assessment
Total number of assessed students: 1

A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0

Provides: RNDr. Aleš Kučera, CSc.

Date of last modification: 31.01.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/SSA/13	**Course name:** Special Seminar in Astronomy

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 credits: 3

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:
Seminar paper.
On the basis of continuous assessment.

Learning outcomes:
Inform students about recent results of astronomical and astrophysical research.

Brief outline of the course:
Recent discoveries in astrophysical research from domestic and world institutes, like exoplanets, cataclysmic variables, quasars, dark matter and dark energy.

Recommended literature:
Current papers in astronomical and astrophysical journals, internet.

Course language:
Slovak, English

Notes:

Course assessment
Total number of assessed students: 2

A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0

Provides: doc. RNDr. Rudolf Gális, PhD., doc. Mgr. Štefan Parimucha, PhD.

Date of last modification: 31.01.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚTVŠ/ TVa/11	**Course name:** Sports Activities I.

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 credits: 2

Recommended semester/trimester of the course: 1.

Course level: I., I.II., II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 7160

abs	n	neabs
88.42	7.82	3.76

Provides: PaedDr. Imrich Staško, doc. PhDr. Ivan Šulc, CSc., doc. Mgr. Rastislav Feč, PhD., Mgr. Ivan Matúš, PhD., Mgr. Zuzana Küchelová, Mgr. Peter Bakalár, PhD., doc. PaedDr. Ivan Uher, PhD., PaedDr. Milena Švedová, PhD., Mgr. Agata Horbacz, PhD., Mgr. Marek Valanský, Mgr. Dávid Kaško

Date of last modification: 15.01.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚTVŠ/ TVb/11	**Course name:** Sports Activities II.

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 credits: 2

Recommended semester/trimester of the course: 2.

Course level: I., I.II., II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 6364

abs	n	neabs
84.95	11.06	3.99

Provides: PaedDr. Imrich Staško, doc. Mgr. Rastislav Feč, PhD., doc. PhDr. Ivan Šulc, CSc., Mgr. Ivan Matúš, PhD., Mgr. Zuzana Küchelová, doc. PaedDr. Ivan Uher, PhD., Mgr. Peter Bakalár, PhD., PaedDr. Milena Švedová, PhD., Mgr. Agata Horbacz, PhD., Mgr. Marek Valanský, Mgr. Dávid Kaško

Date of last modification: 15.01.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚTVŠ/ TVc/11	**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: present

Number of credits: 2

Recommended semester/trimester of the course: 3.

Course level: I., I.II., II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 4191

abs	n	neabs
89.91	4.72	5.37

Provides: PaedDr. Imrich Staško, doc. Mgr. Rastislav Feč, PhD., doc. PhDr. Ivan Šulc, CSc., Mgr. Ivan Matúš, PhD., Mgr. Zuzana Küchelová, doc. PaedDr. Ivan Uher, PhD., PaedDr. Milena Švedová, PhD., Mgr. Peter Bakalár, PhD., Mgr. Agata Horbacz, PhD., Mgr. Marek Valanský, Mgr. Dávid Kaško

Date of last modification: 15.01.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚTVŠ/ TVd/11	**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: present

Number of credits: 2

Recommended semester/trimester of the course: 4.

Course level: I., I.II., II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 3363

abs	n	neabs
86.14	6.78	7.08

Provides: PaedDr. Imrich Staško, doc. Mgr. Rastislav Feč, PhD., doc. PhDr. Ivan Šulc, CSc., Mgr. Ivan Matúš, PhD., Mgr. Zuzana Küchelová, PaedDr. Milena Švedová, PhD., Mgr. Peter Bakalár, PhD., doc. PaedDr. Ivan Uher, PhD., Mgr. Agata Horbacz, PhD., Mgr. Marek Valanský, Mgr. Dávid Kaško

Date of last modification: 15.01.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/SVK/13	**Course name:** Student Scientific Conference

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: present

Number of credits: 4

Recommended semester/trimester of the course:

Course level: I., II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 11

A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0

Provides:

Date of last modification: 31.01.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚTVŠ/ LKSp//13	**Course name:** Summer Course-Rafting of TISA River
Course type, scope and the method: **Course type:** Practice **Recommended course-load (hours):** **Per week:** 36 **Per study period:** 504 **Course method:** present	
Number of credits: 2	
Recommended semester/trimester of the course:	
Course level: I., II.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 63	

abs	n
41.27	58.73

Provides: Mgr. Peter Bakalár, PhD.
Date of last modification: 15.01.2014
Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/PAF/13	**Course name:** Summer Practice in Astrophysics

Course type, scope and the method:
Course type: Practice
Recommended course-load (hours):
Per week: Per study period: 7d
Course method: present

Number of credits: 5

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:
Observation project.
On the basis of continuous assessment.

Learning outcomes:
The aim of the practice is gaining practical experience with the photometric and spectroscopic observations and data processing.

Brief outline of the course:
Practical photometric and spectroscopic observations of variable stars using telescopes and detectors at Observatory at Kolonica saddle. Reduction and analysis of the observational data and interpretation of obtained results.

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: 1

abs	n	z
100.0	0.0	0.0

Provides:

Date of last modification: 31.01.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚTVŠ/ KP/12	**Course name:** Survival Course
Course type, scope and the method: **Course type:** Practice **Recommended course-load (hours):** **Per week:** 36 **Per study period:** 504 **Course method:** present	
Number of credits: 2	
Recommended semester/trimester of the course:	
Course level: I., II.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 185

abs	n
41.62	58.38

Provides: Mgr. Marek Valanský
Date of last modification: 15.01.2014
Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: KPPaPZ/UPR/03	**Course name:** The Art of Aiding by Verbal Exchange

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 credits: 2

Recommended semester/trimester of the course: 4.

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 47

A	B	C	D	E	FX
87.23	4.26	2.13	2.13	0.0	4.26

Provides: Mgr. Ondrej Kalina, PhD.

Date of last modification: 04.02.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ TAF1/13	**Course name:** Theoretical Astrophysics 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 credits: 6

Recommended semester/trimester of the course: 1.

Course level: II.

Prerequisities:

Conditions for course completion:
2 written exams in the scope of examples calculated during the course. More than half the number of points is required for continuous assessment.
Oral exam with preparation; 3 questions within the curriculum presented during the course.

Learning outcomes:
Become acquainted with knowledge about the structure and evolution of stars.

Brief outline of the course:
Properties of the stellar matter; the basic equations of stellar structure and the models of stars; sources of energy in stars; the origin, evolution and final stages of stars.

Recommended literature:
1. Böhm-Vittense, E., Introduction to Stellar Astrophysics III, Stellar Structure and evolution, Cambridge University Press, Cambridge, 1989
2. Kipenhahn, R., Weigert, A., Stellar Structure and evolution, Springer-Verlag, Berlin, 1990
3. Hansen, C.J., Kawaler, S.D., Stellar Interiors – Physical Principles, Structure and Evolution, Springer-Verlag, New York, 1994

Course language:
Slovak, English

Notes:

Course assessment
Total number of assessed students: 2

A	B	C	D	E	FX
50.0	0.0	50.0	0.0	0.0	0.0

Provides: doc. RNDr. Rudolf Gális, PhD.

Date of last modification: 31.01.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ TAF2/13	**Course 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 credits: 6

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities: ÚFV/TAF1/13

Conditions for course completion:
1 written exam in the scope of examples calculated during the course. More than half the number of points is required for continuous assessment.
Oral exam with preparation; 3 questions within the curriculum presented during the course.

Learning outcomes:
Become acquainted with the basics of spectra formation in star atmospheres.

Brief outline of the course:
Basic concepts of physics of stellar atmospheres; energy transfer by radiation and convection. Continuous absorption coefficient; model of photosphere. Line absorption coefficient. Properties of spectral lines.

Recommended literature:
1. Gray, D.F.: 1992, The observation and analysis of stellar photospheres, Cambridge University Press, Cambridge.
2. Böhm-Vitense, E.: 1997, Introduction to stellar astrophysics II, Stellar atmospheres, Cambridge University Press, Cambridge.

Course language:
Slovak, English

Notes:

Course assessment
Total number of assessed students: 1

A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0

Provides: doc. RNDr. Rudolf Gális, PhD.

Date of last modification: 31.01.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ MSSTF/14	**Course name:** Theoretical Physics
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of credits: 4	
Recommended semester/trimester of the course:	
Course level: II.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 0

A	B	C	D	E	FX
0.0	0.0	0.0	0.0	0.0	0.0

Provides:
Date of last modification: 14.02.2014
Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/TKL1/99

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 credits: 8

Recommended semester/trimester of the course: 1.

Course level: II.

Prerequisities:

Conditions for course completion:
Successful passing of the final oral 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 language:

Notes:

Course assessment
Total number of assessed students: 63

A	B	C	D	E	FX
47.62	12.7	17.46	11.11	11.11	0.0

Provides: prof. RNDr. Michal Jaščur, CSc., RNDr. Lukáš Mižišin
Date of last modification: 31.01.2014
Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ PHD/13	**Course name:** Variable and Binary Stars

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 credits: 5

Recommended semester/trimester of the course: 1.

Course level: II.

Prerequisities:

Conditions for course completion:
2 tests during term. Each test for 15 points. Minimal amounts of points for an exam is 20.
Oral examination and test.

Learning outcomes:
Acquaint students with properties of variable stars, their distribution and basic characteristics, as well as give introduction to binaries, their observations and analysis of light curve and radial velocities.

Brief outline of the course:
Definition of variable stars and historical review, searching for variability and periodicity of variations. Classification of variable stars and basic parameters. Visual and spectroscopic binaries. Two body problem and orbital parameters. Roche model, mass exchange in binaries and eclipsing binaries. Period changes.

Recommended literature:
1. Egglecton: 2006: Evolutionary Processes in Binary and Multiple Stars, Cambridge University Press
2. Hilditch: 2001, Close binaries, Cambridge University Press
3. Kallrath J., Milone E.F.: 2009, Eclipsing Binary Stars - Modeling and Analysis, Springer
4. Lena et al.: 1996, Observational Astrophysics, Springer-Verlag
5. Roth G.: 1994, Compendium of Practical Astronomy, Springer-Verlag
6. Sterken a Jashek, 1996, Light Curves of variable Stars, Cambridge University Press
7. Warner: 1995, Cataclysmic Variables, Cambridge University Press

Course language:
Slovak, English

Notes:

Course assessment
Total number of assessed students: 1

A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0

Provides: doc. Mgr. Štefan Parimucha, PhD.

Date of last modification: 31.01.2014

Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚTVŠ/ ZKLS//13	**Course name:** Winter Ski Training Course
Course type, scope and the method: **Course type:** Practice **Recommended course-load (hours):** **Per week:** 36 **Per study period:** 504 **Course method:** present	
Number of credits: 2	
Recommended semester/trimester of the course:	
Course level: I., II.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 59

abs	n
25.42	74.58

Provides: PaedDr. Imrich Staško, doc. PhDr. Ivan Šulc, CSc.
Date of last modification: 15.01.2014
Approved: prof. RNDr. Andrej Bobák, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: D PrávF/ZP2/11	**Course name:** Základy práva pre prirodovedcov 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 credits: 4	
Recommended semester/trimester of the course:	
Course level: II.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 95

abs	n
97.89	2.11

Provides:
Date of last modification: 14.01.2014
Approved: prof. RNDr. Andrej Bobák, DrSc.