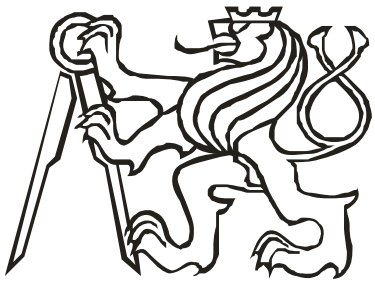

Czech Technical University in Prague

Curricula 2013-2014

Faculty of Nuclear Sciences and Physical Engineering

FACULTY OF NUCLEAR SCIENCES AND PHYSICAL ENGINEERING CZECH TECHNICAL UNIVERSITY IN PRAGUE

The Faculty of Nuclear Sciences and Physical Engineering (FNSPE) was established in 1955, as part of the Charles University, but in 1959 became a new special faculty of the Czech Technical University in Prague. The establishment of the Faculty was connected with the beginning of a new era of the peaceful use of nuclear energy. A complex approach to all nuclear branches was intended, so specialists from universities, technological institutions, and industry were brought together to comply with this task. Later, newly developed areas of physics application, e.g. plasma and solid state physics, lasers, cosmic research were included in the Faculty curricula.

The characteristics of the Faculty activities developed during its history, and the most advanced areas of technological progress have always attracted its attention. Students with a special interest in mathematics were taught individually, and, subsequently, the study of mathematical engineering was established. In the last fifteen years the rapidly developing branches of mathematical and software engineering, interdisciplinary application to ecology, medicine, economy, archeology have been also evolved. The Faculty is equipped with several large research facilities, such as the VR-1 training nuclear reactor, scanning electron microscopes, high power laser systems, computational and advanced radiochemical laboratories, and satellite laser ranging station (Helwan, Egypt).

14101 DEPARTMENT OF MATHEMATICS - KM

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Department Manager	doc. Mgr. Milan Krbálek, Ph.D.
Secretary	Marie Vostřáková
Academic Staff	prof. Dr. Ing. Michal Beneš prof. RNDr. Čestmír Burdík, DrSc. prof. Ing. Jan Flusser, DrSc. prof. Ing. Miloslav Havlíček, DrSc. prof. Ing. Edita Pelantová, CSc. prof. RNDr. Vladislav Šimák, DrSc. prof. Ing. Pavel Šťovíček, DrSc. doc. RNDr. Emil Humhal, CSc. doc. Mgr. Milan Krbálek, Ph.D. doc. RNDr. Jan Mareš, CSc. doc. Ing. Zuzana Masáková, Ph.D. doc.Ing. Severin Pošta, Ph.D. Ing. Petr Ambrož, Ph.D. Ing. Ľubomíra Balková, Ph.D. Ing. Zdeněk Čulík Ing. Radek Fučík, Ph.D. Ing. Tomáš Hobza, Ph.D. Ing. Václav Klika, Ph.D. Ing. Václav Kůs, Ph.D. Ing. Jiří Mikyška, Ph.D. Ing. Tomáš Oberhuber, Ph.D. Ing. Pavel Strachota, Ph.D. Ing. Matěj Tušek, Ph.D. Ing. Leopold Vrána
Scientific Staff	Ing. Miroslav Minárik
Technical Staff	Pavel Kerouš

Mathematics is one of the main theoretical disciplines at FNSPE. The Department of Mathematics provides all tutoring for all the study branches of mathematics taught at the faculty.

The study of mathematics takes place during the first three years. The students gain a relatively deep knowledge of mathematical analysis and linear algebra. They become familiar with the basics of working with computers. Courses in other mathematical disciplines follow, such as ordinary and partial differential equations, numerical methods, probability theory and mathematical statistics.

In all specializations guaranteed by the Department, emphasis is put on the applications of knowledge, including solving the problems using modern computer technology. Teaching takes place„within science“, because students solve tasks in their thesis that stem from either theoretical or practical problems appearing in various areas of science, technology, or industry.

The staff of the Department engage in scientific research, mainly in the areas of:

- applications of algebra, functional analysis and geometry in mathematical physics and quantum theory
- mathematical modelling, creating and analysing deterministic and stochastic models of physical, technological, ecological, biological medicinal processes
- applying algebraic number theory and discrete mathematics in symbolical dynamical systems
- analysis of the microscopic structure of transportation flows and modelling agent systems
- statistical processing of general monitoring signals with applications in acoustical defectoscopy of materials.

14102 DEPARTMENT OF PHYSICS - KF

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Deputy Department Head	doc. Ing. Goce Chadzitaskos, CSc.
Secretary	Alena Kůrová
Academic Staff	prof. RNDr. Ladislav Hlavatý, DrSc. prof. Ing. Igor Jex, DrSc. prof. RNDr. Vladislav Šimák, DrSc. prof. Ing. Jiří Tolar, DrSc. doc. Ing. Zdeněk Češpíro, CSc. doc. Ing. Goce Chadzitaskos, CSc. doc. RNDr. Vojtěch Petráček, CSc. doc. Ing. Libor Šnobl, Ph.D. doc. Ing. Ivan Štoll, CSc. doc. Mgr. Boris Tomášik, Ph.D. Mgr. Jaroslav Bielčík, Ph.D. RNDr. David Břeň, Ph.D. RNDr. Eva Havránková Ing. Petr Jizba, Ph.D. Ing. Vojtěch Svoboda, CSc. Ing. Libor Škoda Václav Vrba, prom. fyz., CSc. RNDr. Vladimír Wagner, CSc.
Scientific Staff	Ing. Jaroslav Adam Jiří Adam, prom.fyz., CSc. RNDr. Dagmar Adamová, CSc. Ing. Iva Bezděková RNDr. Jana Brotánková, Ph.D. prof. Guillermo Contreras Nuno, Ph.D. Ing. Mária Čarná Ing. Jan Čepila prof. RNDr. Pavel Exner, DrSc. Aurél Gábris, Ph.D. Ing. Olga Hájková Ing. Lenka Háková Craig Hamilton, Ph.D. Ing. Miroslav Havránek

	Ing. Jiří Hejbal, Ph.D.
	Ing. Martin Hejtmánek
	Ing. Jiří Hrivnák, Ph.D.
	Ing. Zdeněk Hubáček,PhD.
	RNDr. Petr Chaloupka, Ph.D.
	Ing. Zdenko Janoška
	Ing. Jan Korbel
	Bc. Oleksandr Korchak
	Ing. Michal Křelina
	Ing. Hynek Lavička, Ph.D.
	Bc. Denis Lednický
	Stepan Manko, MSc., Ph.D.
	Ing. Marčišovský Michal
	RNDr. Jan Mlynář, Ph.D.
	Ing. Miroslav Myška
	RNDr. Ján Nemčík, CSc.
	Ing. Jaroslav Novotný, Ph.D.
	Ing. Petr Novotný, Ph.D.
	Ing. Michal Odstrčil
	Ing. Ivo Petr
	RNDr. Jiří Popule
	Ing. Václav Potoček, Ph.D.
	Ing. Jan Smotlacha, Ph.D.
	RNDr. Pavel Staroba, CSc.
	RNDr. Jan Stöckel, CSc.
	Ing. Petr Šícho
	Ing. Michal Špaček
	Ing. Martin Štefaňák, PhD.
	Ing. Lukáš Tomášek
	Ing. Michal Tomášek
	Ing. Čeněk Zach
	Ing. Václav Zatloukal
Technical Staff	Mgr. Zdeňka Císlerová
	Ing. Anna Chmelová
	Monika Mikšovská
	Ing. Gabriel Vondrášek

The department of physics offers physics courses on the BSc. and MSc. level. The courses include mechanics, electricity and magnetism, thermodynamics and statistical physics, wave phenomena, optics and atomic physics. The department offers advanced courses based on the elementary courses including experimental physics, theoretical physics including classical and quantum, nuclear physics, elementary particle physics and plasma physics. Advanced courses include specialized courses based on the graduate's chosen profile.

Graduates are prepared for scientific as well as experimental work. The broad offer and extensive studies allow the graduates to pursue careers in scientific centres or commercially oriented high technology companies.

The research activities of the department follow several lines. The core activities include mathematical physics and experimental nuclear physics and are supplemented by activities in theoretical physics, statistical physics, quantum optics and quantum informatics, computer physics and plasma physics. PhD studies can be pursued in all the above listed specializations. The department offers PhD studies in Mathematical physics (Mathematical engineering), Experimental nuclear physics (Nuclear engineering) and Physics and technology of thermonuclear fusion (Physical engineering)

The scientific activities of the department are closely linked with foreign partners and scientific centres abroad.

14111 DEPARTMENT OF SOLID STATE ENGINEERING - KIPL

Postcode 120 00 Praha 2, Trojanova 13	tel. 224 358 611 fax 224 358 601 e-mail: kipl@fjfi.cvut.cz URL: http://kipl.fjfi.cvut.cz
Head of Department	doc. Ing. Ladislav Kalvoda, CSc.
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Secretary	Dana Karnetová
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Scientific Staff	Ing. Jan Aubrecht Ing. Rudolf Klepáček Ing. Monika Krůželová Ing. Zdeněk Pala Ing. Andrea Štěpánková
Professor Emeritus	prof. RNDr. Helmar Frank, DrSc.
Technical Staff	Čestmír Hlušička Miroslav Pleninger Milena Uhmannová

The department guarantees the education of specialists in the field of Physical Engineering, specialization Solid State Engineering. The study program is based on the fundamentals of theoretical and experimental solid state physics with an emphasis on the following disciplines: theory and structure of solid matter, physics of semiconductors, superconductors, metals, dielectrics, magnetic materials, surfaces and thin layers, low temperature physics, analogue and microprocessor electronics, technology of semiconductor devices and computer simulations of properties of condensed systems.

The scientific and research activity of the department takes place at specialized research workplaces - laboratories. They comprise (in alphabetic order) the Laboratory of Applied Photonics (LAP), Laboratory of Materials Modelling (LMM), Laboratory of Neutron Diffraction (LND), Laboratory of Optical Spectroscopy (LAP), Laboratory of Experiment Control (LEC) and Laboratory of Structural Roentgenography (LSR). The problems solved cover both pure and applied fields of research. The education that forms the focus of the bachelor, magisterial and doctoral program closely relates to research projects in the laboratories, which are carried out in co-operation with Czech and foreign research and educational institutions.

14112 DEPARTMENT OF PHYSICAL ELECTRONICS - KFE

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Workplace Troja:

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tel. 221 912 273 fax: 284 684 818
e-mail: kfe@fjfi.cvut.cz
URL: http://kfe.fjfi.cvut.cz

Head of Department	prof. Ing. Pavel Fiala, CSc.
Deputy Department Heads	prof. Ing. Václav Kubeček, DrSc. doc. Ing. Milan Šiňor, Dr.
Scientific Secretary	Bc. Radka Havlíková
Secretary	Iva Ornová
Academic Staff	prof. Ing. Ladislav Drška, CSc. prof. Ing. Pavel Fiala, CSc. prof. Ing. Helena Jelínková, DrSc. prof. Ing. Jaroslav Král, CSc. prof. Ing. Václav Kubeček, DrSc. prof. Ing. Jiří Limpouch, CSc. prof. Ing. Ivan Procházka, DrSc. doc. Ing. Miroslav Čech, CSc. doc. Ing. Milan Kálal, CSc. doc. Ing. Richard Liska, CSc. doc. Ing. Antonín Novotný, DrSc. doc. Ing. Ladislav Pína, DrSc. doc. Ing. Ivan Richter, Dr. doc. Ing. Milan Šiňor, Dr. Ing. Josef Blažej, Ph.D. Ing. Miroslav Dvořák, PhD. Ing. Petr Gavrilov, CSc. Ing. Alexandr Jančárek, CSc. Ing. Ondřej Klimo, Ph.D. Ing. Jan Kodet, PhD. Ing. Milan Květoň, Ph.D. Ing. Milan Kuchařík, PhD. RNDr. Martin Michl, Ph.D. Ing. Jakub Svoboda Ph.D.

	Ing. Marek Škereň, Ph.D.
	Ing. Jan Šulc, Ph.D.
	Ing. Pavel Váchal, PhD.
	Ing. Josef Voltr, CSc.
	Ing. Michal Němec, PhD.
	Ing. Jaroslav Pavel
	RNDr. Jan Proška
	Bc. Radka Havlíková
Research and Development Staff	Ing. Jan Fiala
	Mgr. Libor Švéda, Ph.D.
Technical Staff	Josef Brzák
	Daniel Hausenblas
	Jan Stoklasa
	Zdeněk Škutina

Broad spectrum of specializations available at the Department allows students to acquire, in addition to a general foundation in applied physics, also deeper knowledge and experience from experiments in the field of physics and technology of lasers, classical and quantum electronics, in contemporary optics, optoelectronics, microelectronics, in nanostructures and associated advanced technologies, in technology and application of ion beams, etc. During their studies at the Department students can also broaden their knowledge in applied information technology, in particular connected to the modelling of physical processes.

The department is also participating in providing a basic education in the field of information technology, numerical mathematics and physics, and also covers the fundamentals of electronics and molecular physics.

Scientific activities carried out in the Department offer students a wide range of opportunities for direct involvement in research work in teams within the Department as well as in a considerable variety of cooperating research institutes, allowing their participation in projects both domestic as well as international. Whereby acquired skills become very useful for students' future prospects in fundamental as well as in applied research. The department possesses well-equipped specialized laboratories with contemporary experimental as well as computer technologies, and also features laboratories for the practical education of students (in electronics, optoelectronics and optics, and laser technology). The department also maintains several computer laboratories (PC and UNIX workstations) accessible to students on a 24/7 basis.

14114 DEPARTMENT OF MATERIALS - KMAT

Postcode 120 00 Praha 2, Trojanova 13	tel. 224 358 501 - 09 fax 224 358 523 e-mail: kmat@fjfi.cvut.cz URL: http://www.kmat.fjfi.cvut.cz
Head of Department	prof. Ing. Jiří Kunz, CSc.
Deputy Department Head	doc. Ing. Petr Kopřiva, CSc.
Department Manager	Ing. Aleš Materna, Ph.D.
Secretary	Helena Knoppová
Academic Staff	prof. Dr. Ing. Pavel Chráska, DrSc. prof. Dr. RNDr. Miroslav Karlík prof. Ing. Jiří Kunz, CSc. prof. Ing. Ivan Nedbal, CSc. doc. Dr. Ing. Petr Haušild doc. Ing. Petr Kopřiva, CSc. doc. Ing. Hynek Lauschmann, CSc. doc. Ing. Vladislav Oliva, CSc. doc. Ing. Jan Siegl, CSc. (vedoucí laboratoří) Ing. Petr Jaroš, CSc. Ing. Ondřej Kovářík, Ph.D. Ing. Aleš Materna, Ph.D. Ing. Radek Mušálek, Ph.D. Ing. Hanuš Seiner, Ph.D. Ing. Jan Adámek
Technical Staff	Ivana Bubalová Miloš Krása Jiří Rudolf Jiří Švácha

Students are provided with an education emphasising the fundamentals and principles of theoretical and experimental study of structure/property relationship. They are orientated towards the application of various research methods into the solution of problems dealing with the development of new materials and technologies, testing of material properties, mathematical modelling of crack growth, reliability of mechanical systems etc. Within the framework of individual projects, students participate in the research activities of the Department of materials. Wide cooperation with many institutions from both industry and academia is focused especially on the study of damage processes, failure analysis, material testing etc. Special attention is given to the fatigue of structural materials; this degradation process is studied by means of mathematical modelling of stress and strain fields on the crack tip, a probabilistic approach to the damage process, experimental testing methods and microfractography. The fractographic laboratory has a broad spectrum of activities; the results are applied in such areas as classical and nuclear power engineering, aerospace, transport industry, machinery, chemical engineering, etc. In the above-mentioned areas, graduates will find accessible very good possibilities of jobs and opportunities to put their knowledge into practice.

14115 DEPARTMENT OF NUCLEAR CHEMISTRY - KJCH

Postcode 115 19 Praha 1, Břehová 7	tel. 224 358 207 fax 222 317 626 e-mail: kjch@fjfi.cvut.cz URL: http://kjch.fjfi.cvut.cz
Head of Department	prof. Ing. Jan John, CSc.
Deputy Department Head	doc. Mgr. Dušan Vopálka, CSc.
Department Manager	Ing. Alois Motl, CSc.
Secretary	Marie Kotasová
Academic Staff	prof. Ing. Petr Beneš, DrSc. prof. Ing. Viliam Múčka, DrSc. prof. Ing. Milan Pospíšil, DrSc. prof. Ing. Jan John, CSc. doc. Ing. Václav Čuba, Ph.D. doc. Ing. Rostislav Silber, CSc. doc. Ing. Ferdinand Šebesta, CSc. doc. Ing. Karel Štamberg, CSc. doc. Mgr. Dušan Vopálka, CSc. Ing. Kateřina Čubová, Ph.D. Ing. Barbora Drtinová, Ph.D. Ing. Helena Filipská, Ph.D. RNDr. Ján Kozempel, Ph.D. Ing. Alois Motl, CSc. Ing. Mojmír Němec, Ph.D. Mgr. Aleš Vetešník, Ph.D. Ing. Alena Zavadilová, Ph.D. Ing. Jan Bárta
Scientific Staff	RNDr. Jana Šuľaková, Ph.D. Ing. Petr Distler Ing. Kamil Vavřinec Mareš Ing. Soběslav Neufuss Ing. Tereza Pavelková Ing. Lenka Procházková Ing. Aneta Sajdová Ing. Irena Špendlíková Mgr. Kamila Šťastná RNDr. Martin Vlk Bc. Petra Mičolová
Technical Staff	Ing. Šárka Hráčková Mgr. Štěpánka Maliňáková

Alena Matyášová
Olga Múčková
Jana Steinerová

The department provides education in nuclear chemistry at three different levels. The education of students at bachelor level puts emphasis on a good basis in maths, physics and a theoretical and practical training in all chemical fields including nuclear chemistry. In the master programme the department provides an education in basic and applied research in the field of nuclear chemistry, environmental chemistry and applied nuclear chemistry including nuclear chemistry in biology and medicine. Graduates have a good theoretical basis and practical training for the work in chemical and radiochemical laboratories. They are able to use chemical and radiochemical methods to solve analytical, ecological, physico-chemical, biomedical and technological problems. Graduates are employed in research institutes, nuclear power plants, hospitals and engineering companies. The Ph.D. course in nuclear chemistry is oriented towards the candidates' independent research. The main areas of research activity are focused on radioecology, the chemistry of the nuclear fuel cycle, radiation methods and radionuclide behaviour in the environment, separation of radionuclides and heavy metals, radiation methods, treatment of radioactive wastes, modelling of the migration and separation processes and the application of radionuclides and ionising radiation in research.

14116 DEPARTMENT OF DOSIMETRY AND APPLICATION OF IONISING RADIATION - KDAIZ

Postcode 115 19 Praha 1, Břehová 7	tel. 222 314 132, 224 358 255	fax 224 811 074
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	URL: http://kdaiz.fjfi.cvut.cz	

Head of Department	prof. Ing. Tomáš Čechák, CSc.
Deputy Department Head	doc. Ing. Jaroslav Klusoň, CSc. doc. Ing. Tomáš Trojek, Ph.D.
Department Manager	RNDr. Lenka Thinová
Secretary	Jana Pavlíková
Academic Staff	prof. Ing. Tomáš Čechák, CSc. prof. Ing. Ladislav Musílek, CSc. doc. Ing. Jaroslav Klusoň, CSc. doc. Ing. Tomáš Trojek, Ph.D. Ing. Petr Průša, Ph.D. RNDr. Jan Smolík, Ph.D. Ing. Václav Spěváček RNDr. Lenka Thinová Ing. Tomáš Vrba, Ph.D.
Scientific Staff	Ing. Kamil Augsten Mgr. Hana Bártová Ing. Marie Davídková, CSc. Mgr. Pavla Doškářová, Ph.D. Ing. Lenka Dragounová Ing. Jiří Martinčík, Ph.D. Ing. Martin Steiner Ing. Tomáš Urban Ing. Kateřina Vávrů
Technical Staff	Vladimír Němec Jindra Niederlová Petra Kohoutová Markéta Šmejkalová

Department of Dosimetry and Application of Ionising Radiation educates new experts in the specialization Dosimetry and Applications of Ionising Radiation in the programmes Radiological Physics, Radiological Technics and in the specialization Radiation Protection and Environment.

The master study specialization Dosimetry and Applications of Ionising Radiation offers the following fields of study: Experimental Nuclear Physics and Technology, Personal Dosimetry, Environmental Problems, Dosimetry of Nuclear Technology Devices, Metrology of Ionising

Radiation, Application of Ionising Radiation in Science, Technology and Medicine and in other branches using the ionising radiation and radioisotopes. The education also concentrates on Mathematical Modelling of the Radiation Transport and Biological Effectiveness of Ionising Radiation.

The Master study programme Radiological Physics and the Bachelor study programme Radiological Technics are the medical programmes according to the Act 96/2004 Coll. All students take general courses in Mathematics and Physics in their first year. These programmes include the core courses in Radiodiagnostics, Radiotherapy and Nuclear medicine plus the basic medical courses Anatomy, Physiology, Biology, Biochemistry etc. and the courses in Dosimetry, Detection techniques, Imaging methods and Mathematical Modelling in Radiological Physics.

The Bachelor study specialization Radiation Protection and Environment offers the following fields of study: Experimental Nuclear Physics and Technology, Personal Dosimetry, Dosimetry and Environmental Problems in Application of Ionising Radiation.

The Department is also engaged in research work in the field of Nuclear physics, Dosimetry and Radiological Physics. It cooperates with many Universities and research Institutes in the Czech Republic and abroad.

14117 DEPARTMENT OF NUCLEAR REACTORS - KJR

Postcode 180 00 Praha 8, V Holešovičkách 2

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e-mail: kjr@fjfi.cvut.cz
URL: http://www.fjfi.cvut.cz
URL: http://www.reaktorvr1.eu

Head of Department	Ing. Ľubomír Sklenka, Ph.D.
Deputy Department Head	Ing. Jan Rataj, Ph.D.
Department Manager	Ing. Tomáš Bílý
Secretaries	Zdeňka Chaberová, Milada Janková
Academic Staff	prof. Ing. Bedřich Heřmanský, CSc. doc. Ing. Martin Kropík, CSc. doc. Ing. Jaroslav Zeman, CSc. Ing. Dušan Kobylka, Ph.D. Ing. Ľubomír Sklenka, Ph.D. Ing. Jan Rataj, Ph.D. Ing. Jan Frýbort Ing. Ondřej Huml Mgr. Jaroslav Bouda
Research Staff	Ing. Tomáš Bílý Ing. Filip Fejt Ing. Lenka Heraltová Ing. Evžen Losa Ing. Radovan Starý Ing. Milan Štefánik Ing. Miroslav Vinš
Technical Staff	Vojtěch Fornůsek Vladimír Konůpka Marek Šedlbauer

The Department of Nuclear Reactors provides education in the field of Nuclear Engineering. Within the Bachelor's degree programme the education is specialized in „Theory and Technology of Nuclear-Reactors". Within the successive Master degree programme education is specialized in „Theory and Technology of Nuclear-Reactors" and „Nuclear Energy and Environment". In the parallel Bachelor's degree programme education is specialized in „Nuclear facilities". Within the doctoral programme students can specialize in reactor physics, safety of nuclear installations, applied nuclear physics, and in nuclear energy and the environment. At the department theoretical education is supported by experimental education in laboratories and at VR-1 training reactor. Scientific activity of the department is focused on issues of theoretical and experimental reactor physics, digital control systems of research reactors, modelling of NPP operational states,

preparation of educational materials, NPP safe and reliable operation of nuclear facilities, including ecological aspects, alternative sources of energy, calculation of parameters of burned-up nuclear fuel, on gen. IV. reactors and on the economic assessment of various nuclear facilities.

The department operates and organizes the utilisation the VR-1 training reactor. Besides departmental students, the reactor serves for education of another ca. 15 Czech faculties and also, to a lesser extent, secondary school students. The reactor workplace is well equipped, with measuring and computation equipment to provide a high standard of education and successive research projects. Because of the reactor, the department cooperates with several foreign universities equipped with similar nuclear facilities (STU Bratislava, TU Wien, TU Budapest, TU Aachen, KTH Stockholm and others).

14118 DEPARTMENT OF SOFTWARE ENGINEERING - KSI

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Workplace Děčín:

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URL: http://kse.fjfi.cvut.cz

Head of Department	doc. Ing. Miroslav Virius, CSc.
Deputy Department Head	doc. Ing. Jaromír Kukal, Ph.D.
Secretary (Prague)	Barbora Ambrosová
Secretary (Děčín)	Dana Landovská
Academic Staff	doc. Ing. Miroslav Virius, CSc. doc. Ing. Jaromír Kukal, Ph.D. prof. RNDr. Ing. Petr Fiala, CSc., MBA prof. Ing. Josef Jablonský, CSc. doc. Ing. Vojtěch Merunka, Ph.D. Mgr. Jiří Fišer, Ph.D. Mgr. Dana Majerová, Ph.D. Mgr. Jana Kalčevová, Ph.D. Ing. Ivo Koubek Ing. Kateřina Horaisová, Ph.D. Ing. Tomáš Liška, Ph.D. Mgr. Zuzana Reitermannová RNDr. Petr Kubera, Ph.D. Ing. Tran Quang Van, CSc. Ph.D.
Research Staff	Ing. Michal Moc
Technical Staff	Bc. Josef Drobný Přemysl Šumpela
Library (Děčín)	Helena Řeháková

Department of Software Engineering in Economics provides education for students of two specializations. For the bachelor's degree, this department offers education in Prague, as well as in the branch of the faculty in Děčín. The continuing master degree study is available in Prague. The education is oriented towards mathematics, information technology and the fundamentals of economics. Students will obtain an in-depth and wide-ranging knowledge of the branches of mathematics common in technical universities. Applications, mainly in software development, are given priority.

DOPPLER INSTITUT - DI

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Director	prof. Ing. Jiří Tolar, DrSc. (KF)
Members	prof. RNDr. Čestmír Burdík, DrSc. (KM) RNDr. Jaroslav Dittrich, CSc. (ÚJF) prof. RNDr. Pavel Exner, DrSc. (KF + ÚJF) prof. Ing. Miloslav Havlíček, DrSc. (KM) prof. RNDr. Ladislav Hlavatý, DrSc. (KF) doc. Ing. Goce Chadzitaskos, CSc. (KF) prof. RNDr. Petr Šeba, DrSc. (UHK) prof. Ing. Pavel Šťovíček, DrSc. (KM) RNDr. Miloš Znojil, DrSc. (ÚJF)

The Doppler Institute was founded 1993 as a centre of research and advanced studies of the FNSPE. The character of FNSPE gives the DI the status of an autonomous part whose activities are financed from external sources. Its members are employees of FNSPE (departments of mathematics and physics), Czech Academy of Sciences (Institute of Nuclear Science) and the University of Hradec Králové.

The prime aim of the Doppler institute is research and advanced studies. In particular research and education in mathematical physics, with an emphasis on modern trends in quantum theory, is cultivated there. The research of the DI benefits considerably from close collaboration with other important centres (Academy of Science, MFF UK, foreign centres). The DI offers opportunities to young talented MSc. and PhD graduates at the start of their scientific carreer. The DI offers Bsc, MSc. and PhD. thesis supervision on modern and up-to-the-minute topics of research and offers the use of a wealth of scientific contacts. The programme of the DI includes a regular Seminar from the DI, The quantum circle and other forms of lectures and seminars. The DI co organizes international colloquia „Integrable systems“, a regular international winter school of mathematical physics and other conferences.

For the year 2006-2001 the activities of the DI were financed by a grant of the Czech Ministry of Education LC06 - Doppler Institute for mathematical physics and applied mathematics lead by prof. RNDr. Pavel Exner. The primarily aim of the project is the support of young researchers and the extension of international collaboration.

DEGREE PROGRAM STRUCTURE

FIELDS OF STUDY AND GRADUATE PROFILES

BACHELOR DEGREE PROGRAM

APPLICATION OF NATURAL SCIENCES

The program is taught in Czech only

degree	code	abbreviation	time extent
Mathematical Engineering	3901R021	MI	3
Mathematical Informatics	3901R058	MINF	3
Computational Physics	3901R065	IF	3
Applied Software Engineering	3901R056	ASI	3
Applied Informatics	3901R057	APIN	3
Nuclear Engineering	3901R016	JI	3
Dosimetry and Applications of Ionising Radiation	3901R060	DAIZ	3
Experimental Nuclear and Particle Physics	3901R061	EJCF	3
Radiological Technology	3901R033	RT	3
Solid State Engineering	3901R066	IPL	3
Diagnostics of Materials	3901R059	DM	3
Physics and Technology of Thermonuclear Fusion	3901R062	FTTF	3
Physical Electronics	3901R063	FE	3
Laser and Instrument Technology	3901R067	LPT	3
Physical Technology	3901R064	FYT	3
Nuclear Chemical Engineering	3901R015	JCHI	3

MASTER DEGREE PROGRAM

APPLICATION OF NATURAL SCIENCES

The program is taught in Czech and English

degree	code	abbreviation	time extent
Mathematical Engineering	3901T021	MI	2
Mathematical Physics	3901T069	MF	2
Applied Mathematical Stochastic Methods	3901T068	AMSM	2
Mathematical Informatics	3901T058	MINF	2
Computational Physics	3901T065	IF	2
Applied Software Engineering	3901T056	ASI	2
Nuclear Engineering	3901T016	JI	2
Dosimetry and Applications of Ionising Radiation	3901T060	DAIZ	2
Experimental Nuclear and Particle Physics	3901T061	EJCF	2
Radiological Physics	3901T034	RF	3
Solid State Engineering	3901T066	IPL	2
Diagnostics of Materials	3901T059	DM	2
Physics and Technology of Thermonuclear Fusion	3901T062	FTTF	2
Laser Technology and Electronics	3901T070	LTE	2
Optics and Nanostructures	3901T071	ON	2
Nuclear Chemistry	3901T072	JCH	2

MATHEMATICAL ENGINEERING

Garant oboru: prof. Dr. Ing. Michal Beneš

Students of Mathematical Modelling deepen their knowledge in the disciplines needed to create mathematical models in various fields of science and technology. They are educated in effective use of top-field computer technology. The thesis is prepared during the last three years, and is mostly directly linked to distinct tasks, specified by teachers of the Department or cooperating experts from other scientific institutions or the industry.

Graduates in the field find themselves employed at universities, research institutions, and those practical fields where the problems being solved require advanced mathematical and computational methods.

MATHEMATICAL PHYSICS

Garant oboru: prof. RNDr Ladislav Hlavatý, DrSc.

The studies allow the student to gain a wide-ranging and in-depth knowledge of physics, in particular theoretical physics and in mathematical methods of physics including modern algebra, differential geometry and algebraic topology. Apart from analytic methods the students develop practical tools of mathematical modelling, the use of modern computers, symbolic computations and simulations of processes of different kinds.

The studies include a significant part of individual work by the students. The high quality of the graduates is guaranteed by international collaboration carried out in cooperation with the Doppler Institute (Czech Academy of Sciences, MFF UK, SÚJV Dubna, Université de Montréal, Université de Paris VII etc.)

The extensive theoretical foundation in modern mathematics and physics, in particular quantum theory allows the graduate to pursue a career in emerging interdisciplinary trends of natural sciences or technology and contribute to their further development during the remainder of the graduate's career.

APPLIED MATHEMATICAL STOCHASTIC METHODS

Garant oboru: doc. Mrg. Milan Krbálek, Ph.D.

Aimed at those students of Mathematics B level who want to continue in their studies of mathematical disciplines which have direct applications. Besides theoretical subjects (advanced calculus, mathematical statistics, probability theory, information theory, numerical mathematics), a large part of the study is dedicated to specific applications (models of transportation, mathematical predictions in biology, statistical methods, decision processes, deterministic chaos, systems of interacting agents, neural networks, image processing, etc).

Graduates benefit from this foremost by getting both a good theoretical background in mathematical-statistical disciplines reflecting current scientific trends and also practical experience in selected fields of applied research.

Graduates get employed in positions involving directing and optimising transportation flows, in technical fields of the transportation, engineering or energy industry, in analytical departments of companies, in statistical research institutions, in research teams of scientific

institutions, in financial institutions, and in many areas of processing engineering, transport, social and reliability data.

MATHEMATICAL INFORMATICS

Garant oboru: prof.Ing. Edita Pelantová, CSc.

Graduates in the specialization Software Engineering and Mathematical Informatics get a good mathematical background and a well-grounded education in computer science. They go through both theoretical parts (mathematics with emphasis on discrete and stochastic areas, algebra, information and coding theory, numerical methods, computability theory, image processing) and practical subjects (programming languages, computer architecture, software team projects, programming techniques, object-oriented programming, operating systems, databases, computer networks, system administration, mainframe administration).

Graduates get employed in design, analysis and management of advanced software projects, in research institutions, in consulting companies and in solving problems requiring difficult mathematical knowledge and computer experience.

APPLIED SOFTWARE ENGINEERING

Garant oboru: doc. Ing. Miroslav Virius, CSc.

With respect to their mathematical and theoretical foundation, a good knowledge of the modern information technologies, economy and international languages, the graduate of this master degree specialization can successfully work in nearly any area of human endeavour. They will be able to offer their talents on the market where people with a technical education and an understanding of computers are in demand. Additionally they will be able to fill posts that require people that have the communication skills and understand the economy, and not only the basic fields of economics, but also in econometrics. Graduates will be experts in all branches of IT – software project managers, analysts, developers, network administrators etc. The study is based on 3 groups of lectures: informatics (software engineering, programming a descriptive languages, databases, heuristics, security), economy (econometrics, economical decision, production systems, business applications) mathematical (statistics, numerical mathematics, graph theory, number theory). Graduates of this type are in demand mainly as employees of software companies, telecommunication and other IT companies, banks, etc., but many of them are successful as independent IT entrepreneurs, because they will display a notable flair for the development of the software for economics. Students of this kind are in demand far more than „pure IT scientists“ or „pure economists“.

NUCLEAR ENGINEERING

Garant oboru: doc. Ing. Martin Kropík, CSc.

Students of this specialization are prepared for both theoretical and experimental work in the field of reactor physics and nuclear power engineering. The programme builds upon the fundamentals of nuclear engineering from the bachelor degree programme. This knowledge is extended by specialization courses focused on nuclear reactor physics (both theoretical and experimental), design and construction of nuclear facilities, hydromechanics and thermomechanics, reactor dynamics, operational nuclear reactor physics, nuclear safety and reliability of nuclear power plant, and alternative sources of energy. The lectures are complemented by practical courses of the student’s choice, such as control of nuclear power plant, applied nuclear physics, advanced reactor physics, diagnostics, radioactive waste, etc.

The education is supported by necessary computer technology, available both at the Department of Nuclear Reactor premises and in FJFI computer laboratories. An important issue is the integration of a number of experimental tasks at the VR-1 training reactor operated by the Faculty. As a result, the right balance between theoretical and experimental aspects is achieved in the education. The education also reflects the achievements of research programme, in which students actively participate by means of their semester and year research projects, and master theses.

In the case of an individual interest, the department can organized a combined education, enhanced in mathematics, informatics, and microprocessor technology, electronics and nuclear dosimetry.

Graduates develop their careers mainly in the field of calculations and their experimental verification, in operation nuclear power plants (eg, control physicist, supervisory functions, etc.), in research and development laboratories and institutes dealing with specific issues of nuclear energy, its impact on the environment and in centres focusing on the area of nuclear energy.

The aim of this specialization is to prepare graduates not only professionally, but also give them a necessary sense of responsibility for their work and decisions.

Education takes place with an appropriate use of computer technology.

DOSIMETRY AND APPLICATIONS OF IONISING RADIATION

Garant oboru: Prof. Ing. Ladislav Musílek, CSc.

For all specializations in the programme Nuclear Engineering, students attend a common core of physics and mathematics courses for three years. This accounts for around 75% of the courses with the remaining 25% comprised of courses drawn from within the department. The programme incorporates courses in Experimental Nuclear Physics and Technology, Personal Dosimetry, Environmental Problems, Dosimetry of Nuclear Technology Device, Metrology of Ionising Radiation, Application of Ionising Radiation in the Science, Technology and Medicine and in other branches using the ionising radiation and radioisotopes. The education also concentrates on Mathematical Modelling of the Radiation Transport and Biological Effectiveness of Ionising Radiation.

EXPERIMENTAL NUCLEAR AND PARTICLE PHYSICS

Garant oboru: doc. RNDr. Vojtěch Petráček, CSc.

Studies are focused on nuclear and subnuclear physics, i.e. sciences searching for fundamental results concerning the structure of matter, and a fundamental understanding of the interactions between elementary particles. Much of the knowledge and methods developed has already left the confines of physics and found application in various other fields of human endeavour.. The curriculum is based on common studies of physics, mathematics and chemistry. The fundamentals of the specialized studies are courses in atomic and subatomic physics which exploit the courses in theoretical and quantum physics. The basic course is followed by courses in the theory of atomic nuclei, neutron physics, atomic and nuclear spectroscopy, electronics for physicists, experimental methods of nuclear and subnuclear physics. The studies also include a two semester practicum in atomic and nuclear physics. Emphasis is put on experimental data acquisition methods, their processing using computer methods and the physical interpretation of the results obtained and possible practical aspects of the methods obtained. The education puts emphasis on individual work in laboratories. Students are closely linked to scientific research programmes and are integrated into modern research teams. The work is carried out in collaboration with institutions

outside the technical university (Academy of sciences, MFF UK, CERN, BNL Brookhaven, FNAL Chicago, GSI Darmstadt etc,).

Graduates in the specialization acquire the qualification of a physicist-researcher with a broad range of possible positions in research (fundamental, applied, strategic) and development. Graduates can solve physics problems using the latest methods in experimental physics. The study offers a complete education in physics chemistry and mathematics which allows graduates to solve new interdisciplinary problems of natural science.

RADIOLOGICAL PHYSICS

Garant oboru: prof.Ing. Tomáš Čechák, CSc.

The programme is primary focused on Radiotherapy, Radiodiagnostics and Nuclear Medicine. The master study programme Radiological Physics deals with the application of ionising radiation in Radiotherapy, Radiodiagnostics and Nuclear Medicine. Upon attaining their bachelor degree graduates will have gained the competency to practise in the medical services in the function radiological physicist. The curriculum takes courses in Nuclear Physics, Physics of Ionising Radiation, Detection and Dosimetry of Ionising Radiation specialised on radiological technics. The education also concentrates on the medical courses Anatomy, Physiology, Biology Biochemistry, Pharmacology, Imaging Methods and Mathematical Modelling in the Radiological Physics. All students undertake a basic practical training in special laboratories. Practical exercises and working experience in hospitals are a part of the study.

SOLID STATE ENGINEERING

Garant oboru: doc. Ing. Ladislav Kalvoda, CSc.

To the graduate student, the courses included in the specialization plan provide knowledge of the physical essence of condensed matter, the theoretical description and interpretation of a considerable variety of special phenomena and properties arising from the diversity of the internal order of solid materials, principals of common experimental techniques and an overview of technical applications used to explore the phenomena and properties mentioned.

Basic mathematical and physical courses are followed by special lectures and practical training familiarizing students with the practical usage of condensed matter physics, such as details and instrumentation of various method of experimental investigation of structure of solid materials, application of optical spectroscopy methods, exploitation of special properties of surfaces and thin layers, metals, semiconductors, superconductors, polymers, dielectrics and magnetic materials and their employment in the recent electronic and photonic technologies, and the application of techniques of computer simulations of structure and properties of condensed systems by methods of quantum and molecular mechanics. The skills obtained by the graduate include analysis of physical and technical problems, creative formulation of new problems to be solved and application of the solutions found in practice.

The graduate of the specialization will find occupation in all academic and industrial facilities dealing with research and development in some of the fields which creatively utilize the findings of condensed matter physics, such as microelectronics, physics of thin films and low-dimensional systems, sensorics, video-technique, photovoltaic, low temperature physics, superconductivity, applied photonics and telecommunications, in specialized analytic and development laboratories working with techniques of optical spectroscopy, X-ray diffraction, electric measurements and computer simulations of materials and, of course, in laboratories of basic research. Because of the analytical and mathematical skills obtained, some of our graduates also find jobs in the sectors of corporate management and finances.

DIAGNOSTICS OF MATERIALS

Garant oboru: prof. Dr. RNDr. Miroslav Karlík

Multi-disciplinary studies are based on the synthesis of knowledge on mechanics of continuum, material sciences and applied mathematics. Study in this specialization is based on a solid grounding in mathematics and physics, and is completed by a knowledge of the physics of solid states, elastomechanics, theory of plasticity, fracture mechanics, computer mechanics, applied theory of probability and mathematical statistics. Graduates, highly qualified, are able to solve demanding problems dealing with the influence of mechanical loading, temperature, aggressive environments and other external effects on materials, development of new materials and technologies, durability and safety of systems etc. In order to study said problems, a wide spectrum of experimental methods, theoretical procedures and mathematical modelling is applied. A substantial part of the education consists of cooperation of students in various research projects carried out at the department of materials or at external institutes and companies. Graduates have very good prospects of jobs in nuclear and classical energy industries, automotive and aircraft engineering, material processing and many other areas. Due to the complex character of knowledge and notable adaptability, graduates are ready for immediate integration into both engineering and research practice.

PHYSICS AND TECHNOLOGY OF THERMONUCLEAR FUSION

Garant oboru: prof. Ing. Igor Jex, DrSc.

The MSc. Studies of this specialization have three strands: theory, experimental physics and fusion technology. Students are required to master a certain minimal amount of knowledge in all three parts. However, students have the possibility to choose which of the directions they prefer and adjust their courses and topic of their MSc. thesis accordingly. The education also requires the study of English as most of the terminology and communication is in English.

Graduates of the specialization have a broad education in mathematics and physics, which can be applied to a number of technological, research and development challenges linked to project of thermonuclear fusion.

The specialization is designed in such a way as to allow a smooth integration into international collaborations in thermonuclear fusion and also participate in decision-making processes involving safety issues of thermonuclear fusion. The graduate can choose a career in research as well as in technology companies or the public sector.

OPTICS AND NANOSTRUCTURES

Garant oboru: doc. Ing. Ivan Richter, Dr.

Students of the specialization will deepen their knowledge in geometrical, physical, diffractive and non-linear optics, holography, optical processing of information, in quantum optics, electrodynamics, quantum physics, and electronics, solid state physics, optoelectronics and x-ray optics. Thereby acquiring more in-depth knowledge in the fields representing the dominant source of information for mankind. According to how optional courses and theses are slelceted students can get involved not only in purely optical topics, but also in closely related problems, e.g., optical aspects of lasers, problems of radiation from plasmas, optical and x-ray measurements, optics of nanstructures, etc.

Besides general theoretical studies in a given field students can also get specific experience and practical skills in experimentally oriented education (from advanced optical practicals,

excursions to various specialized laboratories, and possibly during their own experimental research). In parallel, students are familiarizing themselves with modern trends in a given field.

Graduates – engineers – are able to assert themselves as theoretical and experimental explorers in a wide range of research and development activities (the need for optical methods of measurement is on the rise), besides this graduates can also find a use for their skills in the field of applications – in institutions specialized in measurement control, in industry, communications, public health, and entrepreneurial circles. Internal adaptability is an obvious quality towards which a project oriented educational system of recherché, research and diploma work is aimed.

The master's degree specialization of *Optical Physics* is a direct continuation of the bachelor specialization of Physical Electronics. This specialization is also open to interested graduates of bachelor studies from other departments and faculties. Further information concerning the specialization of *Optical Physics*, requirements, links-up and study plans can be found at *http://kfe.fjfi.cvut.cz*

LASER TECHNOLOGY AND ELECTRONICS

Garant oboru: prof. Ing. Helena Jelínková, DrSc.

Students of the specialization *Laser Technology and Electronics* deepen their knowledge in quantum physics, electronics, electrodynamics, laser technology, optics, solid state physics, modern application of lasers, communications, including advanced applications in biomedicine. Similarly to other specializations students can also broaden their knowledge in related subjects, in this particular case ranging from optics and x-ray lasers, to plasma technologies and applications in medicine.

Graduates – engineers – are finding a range of opportunities available to them everywhere where lasers are used.

This field is gradually broadening; it concerns not only the field of research and development, but also industry, public health, entrepreneurial circles etc. Internal adaptability is an obvious quality towards which a project oriented educational system of recherché, research and diploma work is aimed.

The master's degree specialization of Laser Physics is a direct continuation of bachelor specialization of *Physical Electronics* as well as *Laser Technology and Electronics*. This specialization is also open to interested graduates of bachelor studies from other departments and faculties. Further information concerning specialization of *Laser Technology and Electronics*, requirements, links-up and study plans can be found at *http://kfe.fjfi.cvut.cz*

COMPUTATIONAL PHYSICS

Garant oboru: doc. Ing. Richard Liska, CSc.

Graduates in the specialization Information Physics will represent a specialist with a balanced education in the field of physical principles of top technologies and in the field of informatics with an emphasis on the capability to effectively apply its modern creations in physical and engineering research, in technology transfer, in expertises aimed at physical and technical fields, in knowledge engineering, etc. As a foundation for this activity a high level of computational systems mastering as well as practical experience with programming tools for advanced application of informatics is expected.

These requirements will be ensured by graduation from the basic group of courses in the field of Engineering Informatics on one side and by a wide range of offered optional courses in the field of mathematics, applied physics, computer technology, medical engineering etc., realized directly at the Faculty or offered by external institutions. The education of students in higher grades

is based on individual supervision and their participation in scientific research, in accordance with long term tradition and proven by positive prior experience.

NUCLEAR CHEMISTRY

Garant oboru: prof. Ing. Jan John, CSc.

Nuclear Chemical Engineering educates specialists for basic and applied research and practice in the field of nuclear chemistry, environmental chemistry and applied nuclear chemistry including applications in biology and medicine. The curriculum provides graduates with a good basis in maths and physics and theoretical and practical training in basic chemical fields such as physical, analytical, organic and inorganic chemistry and biochemistry. On this basis the study of all disciplines of nuclear and radiochemistry is developed. Emphasis is put on the practical application of skills in research and engineering. Students may choose from two specializations - Applied Nuclear Chemistry and Nuclear Chemistry in Biology and Medicine.

Graduates have a good theoretical knowledge and are trained for work in radiochemical and chemical laboratories. They know the methods of ionising radiation detection, separation methods, radioanalytical and methods of radiation chemistry. They are familiar with technology of nuclear materials, radiation protection and environmental chemistry. They have skills required to use radiochemical and chemical methods to solve analytical, ecological, physico-chemical, chemico – biomedicinal and technological problems. They are employed in research institutes, medical facilities, nuclear energy industries and chemical industries, designated institutes and the engineering of research and operation.

MASTER DEGREE PROGRAM

Master Degree Program

Mathematical Engineering

Year 1

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Variational Methods	01VAM	Beneš	2 zk	-	3	-
Functional Analysis 3	01FA3	Havlíček	2+1 z, zk	-	3	-
Introduction to Graph Theory A	01ZTGA	Ambrož	4+0 zk	-	4	-
Advanced Methods of Numerical Linear Algebra	01PNLA	Mikyška	2+0 zk	-	3	-
Matrix Theory	01TEMA	Pelantová	-	2+0 z	-	3
Theory of Random Processes	01NAH	Michálek, Veverka	3+0 zk	-	3	-
Finite Element Method	01MKP	Beneš	-	2 zk	-	3
Methods for Sparse Matrices	01MRM	Mikyška	-	2+0 zk	-	2
Research Project 1, 2	01VUMM12	Hobza	0+6 z	0+8 kz	6	8
Optional courses:						
Asymptotical Methods	01ASY	Mikyška	2+1 z, zk	-	3	-
Monte Carlo Method	18MOCA	Virius	2+1 z	-	3	-
Image Processing and Pattern Recognition 1	01ROZ1	Flusser, Zitová	-	2+2 zk	-	4
Signal Analysis	01ASIG	Převorovský	-	3 zk	-	4
Quantum Physics	01KF	Havlíček	-	4+2 z, zk	-	6
Differential Equations on Computer	12DRP	Liska	2+2 z, zk	-	5	-
Information Theory	01TIN	Hobza	2+0 zk	-	2	-
Regression Data Analysis	01REGA	Víšek	2+0 zk	-	2	-
Probabilistic Models of Artificial Intelligence	01UMIN	Vejnarová	2+0 kz	-	2	-
Complexity Theory	01TSLO	Majerech	3+0 zk	-	3	-
Parallel Algorithms and Architectures	01PAA	Oberhuber	-	3 kz	-	4
Applications of Statistical Methods	01ASM	Hobza	-	2+0 kz	-	2
Calculus Revisited	01MADR	Klika	-	0+2 z	-	2
Mathematical Methods in Fluid Dynamics 1, 2	01MMDT12	Fořt, Neustupa	2+0 z	2+0 zk	2	2
Relational Databases	01REDA	Loupal	3+0 zk	-	3	-
Computability and Mathematical Logic	01VYML	Mareš	4+0 zk	-	4	-
Languages and Automata	01JAA	Mareš	-	2+0 zk	-	2
Number Theory	01TC	Masáková, Pelantová	-	4+0 zk	-	4
Introduction to Cryptology	01UKRY	Balková	-	2+0 z	-	2
Aperiodic Structures	01APST	Masáková	2+0 z	-	2	-
Differential Calculus on Manifolds	01DPV	Tušek	-	2+0 zk	-	2
Basic of Representation Theory	01TRLA	Burdík	-	2+0 zk	-	2

Master Degree Program

Mathematical Engineering

Year 2

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Nonlinear Programming	01NELI	Burdík	3+0 zk	-	4	-
Mathematical Modelling of Non-linear Systems	01MMNS	Beneš	2 zk	-	3	-
Diploma Seminar	01DSEM	Ambrož	-	0+2 z	-	3
Master Thesis 1, 2	01DPMM12	Ambrož	0+10 z	0+20 z	10	20
Optional courses:						
Numerical Software	01NUSO	Fürst	2+0 z	-	3	-
Dynamic Decision Making	01DYR	Kárný	3+0 zk	-	3	-
Foundations of Fuzzy Logic (1)	01ZFL	Cintula	2+0 zk	-	2	-
Application of Nonclassical Logic (1)	01ANL	Cintula	2+0 zk	-	2	-
Neural Computers and Their Applications	01NSAP	Hakl, Holeňa	3+0 zk	-	4	-
Probabilistic Learning Models	01PMU	Hakl	2+0 zk	-	2	-
Stochastic Systems	01STOS	Janžura	2+0 zk	-	2	-
Image Processing and Pattern Recognition 2	01ROZ2	Flusser	2+1 zk	-	3	-
Method of Finite Volumes	01MKO	Kozel	1+1 kz	-	2	-
Numerical simulations of Convection problems	01NSPP	Kozel	-	1+1 zk	-	2
Special Functions and Transformations in Image Analysis	01SFTO	Flusser	-	2+0 zk	-	2

(1) These courses are altrernatively open according to the announcement of the department.

Master Degree Program

Mathematical Physics

Year 1

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Quantum Field Theory 1	02KTP1	Hořejší	4+2 z, zk	-	9	-
Groups and Representations	02GR	Chadzitaskos	2+1 z, zk	-	3	-
Quantum Physics	01KF	Havlíček	-	4+2 z, zk	-	6
Geometric Methods in Physics 2	02GMF2	Tolar	-	2+2 z, zk	-	5
Lie Algebras and Lie Groups	02LIAG	Šnobl	-	3+2 z, zk	-	6
Winter School of Mathematical Physics (1)	02ZS	Tolar	1 týden z	-	1	-
Research Project 1, 2	02VUMF12	Hlavatý, Tolar	0+6 z	0+8 kz	6	8
Optional courses:						
Quantum Field Theory 2	02KTP2	Hořejší	-	4+2 z, zk	-	6
Quantum Information and Communication	02KIK	Jex	2+0 z	-	2	-
Nonequilibrium Systems	02NSY	Jex	-	2+0 z	-	2
Functional Analysis 3	01FA3	Havlíček	2+1 z, zk	-	3	-
Asymptotical Methods	01ASY	Mikyška	2+1 z, zk	-	3	-
Theory of Random Processes	01NAH	Michálek, Veverka	3+0 zk	-	3	-
Variational Methods	01VAM	Beneš	2 zk	-	3	-
Advanced Topics of Quantum Theory	02PPKT	Exner	-	2+0 zk	-	2
Relativistic Physics 1	02REL1	Bičák, Semerák	4+2 z, zk	-	6	-
Relativistic Physics 2	02REL2	Bičák, Semerák	-	4+2 z, zk	-	6
Introduction to Graph Theory A	01ZTGA	Ambrož	4+0 zk	-	4	-
Quantum Circle 1, 2	02KVK12	Exner	0+2 z	0+2 z	2	2
Solvable Models of Mathematical Physics (2)	02RMMF	Hlavatý	-	2+0 z	-	2
Introduction to Strings 1, 2 (2)	02UST12	Hlavatý	2+1 z	2+1 z	3	3
Open Quantum Systems	02OKS	Novotný	-	2+0 z	-	2

(1) (1) The course is devoted for the students of this field only.
(2) These courses are altrernatively open according to the announcement of the department.

Master Degree Program

Mathematical Physics

Year 2

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Cohomological Methods in Theoretical Physics	02KOHOM	Tolar	2 zk	-	5	-
Selected Topics in Statistical Physics and Thermodynamics	02VPSF	Jex	2+2 z, zk	-	7	-
Master Thesis 1, 2	02DPMF12	Hlavatý, Tolar	0+10 z	0+20 z	10	20
Optional courses:						
Relativistic Physics 1	02REL1	Bičák, Semerák	4+2 z, zk	-	6	-
Relativistic Physics 2	02REL2	Bičák, Semerák	-	4+2 z, zk	-	6
Quantum Information and Communication	02KIK	Jex	2+0 z	-	2	-
Quantum Groups 1	01KVGR1	Burdík	2+0 z	-	2	-
Mathematical Modelling of Non-linear Systems	01MMNS	Beneš	2 zk	-	3	-
Quantum Circle 1, 2	02KVK12	Exner	0+2 z	0+2 z	2	2
Introduction to Graph Theory A	01ZTGA	Ambrož	4+0 zk	-	4	-
Solvable Models of Mathematical Physics (1)	02RMMF	Hlavatý	-	2+0 z	-	2
Introduction to Strings 1, 2 (1)	02UST12	Hlavatý	2+1 z	2+1 z	3	3
Gemoetrical Aspects of Spectral Theory	02SPEC	Krejčiřík	-	2+0 zk	-	2

(1) These courses are altrernatively open according to the announcement of the department.

Master Degree Program

Applied Mathematical Stochastic Methods

Year 1

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Applied Information Theory	01ATI	Hobza	-	2+0 zk	-	3
Chaotic Systems and Their Analysis	01CHAOS	Krbálek	2+0 zk	-	2	-
Generalized Linear Models and Applications	01ZLIM	Hobza, Víšek	-	2+1 zk	-	3
Monte Carlo Method	18MOCA	Virius	2+1 z	-	3	-
Selected Topics in Functional Analysis	01VPFA	Havlíček, Tušek	-	2+1 z, zk	-	3
System Reliability and Clinical Experiments	01SKE	Kůs	2+0 kz	-	3	-
Modelling of Extreme Events	01MEX	Fabian, Veverka	-	2+0 zk	-	2
Introduction to Graph Theory B	01ZTGB	Ambrož	2+2 z, zk	-	4	-
Regression Data Analysis	01REGA	Víšek	2+0 zk	-	2	-
Image Processing and Pattern Recognition 1	01ROZ1	Flusser, Zitová	-	2+2 zk	-	4
Conference Research Week, Excursion	01KTVE	Krbálek	-	5 dní z	-	1
Research Project 1, 2	01VUAM12	Hobza	0+6 z	0+8 kz	6	8
Optional courses:						
Asymptotical Methods	01ASY	Mikyška	2+1 z, zk	-	3	-
Introduction to Bioinformatics	01UBIO	Oberhuber	2 kz	-	2	-
Diagnostic Signal Processing	01ZSIG	Převorovský	-	3+0 zk	-	3
Calculus Revisited	01MADR	Klika	-	0+2 z	-	2
Mathematical Methods in Biology and Medicine	01MBI	Klika	2+1 kz	-	3	-
Theory of Random Processes	01NAH	Michálek, Veverka	3+0 zk	-	3	-
Probabilistic Models of Artificial Intelligence	01UMIN	Vejnarová	2+0 kz	-	2	-
Special Functions and Transformations in Image Analysis	01SFTO	Flusser	-	2+0 zk	-	2
Matlab Applications	18AMTL	Kukal	-	2+2 kz	-	4
Applied Econometrics and Time Series Theory	18AEK	Sekničková	2+2 z, zk	-	4	-
Introduction to Cryptology	01UKRY	Balková	-	2+0 z	-	2

(1) Grading in 01TKO requires grading in 01ALG.

Master Degree Program

Applied Mathematical Stochastic Methods

Year 2

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Dynamic Decision Making	01DYR	Kárný	3+0 zk	-	3	-
Social Systems and Their Simulation	01SSS	Hrabák, Krbálek	2+1 zk	-	4	-
Design of Experiments	01NEX	Franc, Hobza	2+1 kz	-	4	-
Heuristic Algorithms	18HEUR	Kukal	-	2+2 kz	-	4
Neural Computers and Their Applications	01NSAP	Hakl, Holeňa	3+0 zk	-	4	-
Image Processing and Pattern Recognition 2	01ROZ2	Flusser	2+1 zk	-	3	-
Diploma Seminar	01DSEM	Ambrož	-	0+2 z	-	3
Master Thesis 1, 2	01DPAM12	Ambrož	0+10 z	0+20 z	10	20
Optional courses:						
Stochastic Systems	01STOS	Janžura	2+0 zk	-	2	-
Foundations of Fuzzy Logic (1)	01ZFL	Cintula	2+0 zk	-	2	-
Application of Nonclassical Logic (1)	01ANL	Cintula	2+0 zk	-	2	-
Mathematical Modelling of Non-linear Systems	01MMNS	Beneš	2 zk	-	3	-
Signal and Data Processing	12ZSD	Klimo, Klír, Procházka	2+1 kz	-	4	-

(1) These courses are altrernatively open according to the announcement of the department.

Master Degree Program

Mathematical Informatics

Year 1

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Languages and Automata	01JAA	Mareš	-	2+0 zk	-	2
Computability and Mathematical Logic	01VYML	Mareš	4+0 zk	-	4	-
Information Theory	01TIN	Hobza	2+0 zk	-	2	-
Parallel Algorithms and Architectures	01PAA	Oberhuber	-	3 kz	-	4
Image Processing and Pattern Recognition 1	01ROZ1	Flusser, Zitová	-	2+2 zk	-	4
Complexity Theory	01TSLO	Majerech	3+0 zk	-	3	-
Number Theory	01TC	Masáková, Pelantová	-	4+0 zk	-	4
Matrix Theory	01TEMA	Pelantová	-	2+0 z	-	3
Introduction to Graph Theory A	01ZTGA	Ambrož	4+0 zk	-	4	-
Object Oriented Programming	18OOP	Virius	0+2 z	-	2	-
Research Project 1, 2	01VUSI12	Hobza	0+6 z	0+8 kz	6	8
Optional courses:						
Software Project 1, 2	01SWP12	Minárik	0+2 z	0+2 z	4	4
Introduction to Mainframe (1)	01UMF	Oberhuber	2 z	-	2	-
Mainframe Maintenance (2)	01SMF	Oberhuber	-	2 z	-	2
Mainframe Programming (2)	01PMF	Oberhuber	-	2 z	-	2
Introduction to Bioinformatics	01UBIO	Oberhuber	2 kz	-	2	-
Software Testing and Verification (4)	01TVS	Mařík	2+2 z, zk	-	6	-
Signal Analysis	01ASIG	Převorovský	-	3 zk	-	4
Monte Carlo Method	18MOCA	Virius	2+1 z	-	3	-
Regression Data Analysis	01REGA	Víšek	2+0 zk	-	2	-
Methods for Sparse Matrices	01MRM	Mikyška	-	2+0 zk	-	2
Probabilistic Models of Artificial Intelligence	01UMIN	Vejnarová	2+0 kz	-	2	-
Applications of Statistical Methods	01ASM	Hobza	-	2+0 kz	-	2
Advanced Methods of Numerical Linear Algebra	01PNLA	Mikyška	2+0 zk	-	3	-
Relational Databases	01REDA	Loupal	3+0 zk	-	3	-
Aperiodic Structures	01APST	Masáková	2+0 z	-	2	-
Introduction to Cryptology	01UKRY	Balková	-	2+0 z	-	2
Financial and Insurance Mathematics	01FIMA	Hora	2+0 zk	-	2	-
Assistive Technology	01ASTE	Seifert	0+1 z	-	2	-
CAD Systems in Electronics	12CAD	Pavel	-	4+0 z, zk	-	4

(1) Taught in cooperation with Computer Associates, ČR.
(2) Taught in cooperation with IBM, ČR.
(3) Another optional courses ca be A4M33AU Automated Decision, A4M33BIA Biologically Inspired Algorithms, A4B33FLP Functional and Logical Programming, A4M33SAD Machine Learning and Data Analysis, A3B33KUI Cybernetics and Artificial Intelligence, A4M33MAS Multi-Agent Systems taught at the FEL ČVUT v Praze.
(4) Taught at the FEL ČVUT v Praze.

Master Degree Program

Mathematical Informatics

Year 2

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Numerical Software	01NUSO	Fürst	2+0 z	-	3	-
Image Processing and Pattern Recognition 2	01ROZ2	Flusser	2+1 zk	-	3	-
Neural Computers and Their Applications	01NSAP	Hakl, Holeňa	3+0 zk	-	4	-
Diploma Seminar	01DSEM	Ambrož	-	0+2 z	-	3
Master Thesis 1, 2	01DPSI12	Ambrož	0+10 z	0+20 z	10	20
Předměty volitelné:						
Nonlinear Programming	01NELI	Burdík	3+0 zk	-	4	-
Dynamic Decision Making	01DYR	Kárný	3+0 zk	-	3	-
Foundations of Fuzzy Logic (1)	01ZFL	Cintula	2+0 zk	-	2	-
Application of Nonclassical Logic (1)	01ANL	Cintula	2+0 zk	-	2	-
Probabilistic Learning Models	01PMU	Hakl	2+0 zk	-	2	-
Stochastic Systems	01STOS	Janžura	2+0 zk	-	2	-
Special Functions and Transformations in Image Analysis	01SFTO	Flusser	-	2+0 zk	-	2
Mathematical Modelling of Non-linear Systems	01MMNS	Beneš	2 zk	-	3	-

(1) These courses are altrernatively open according to the announcement of the department.

Master Degree Program

Computational Physics

Year 1

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Concepts of Information Physics 1, 2	12KOF12	Drška, Kuchařík, Šiňor	2+0 z	2+0 zk	3	3
Differential Equations on Computer	12DRP	Liska	2+2 z, zk	-	5	-
Advanced Numerical Methods	01PNM	Beneš	-	2+0 kz	-	2
Electrodynamics 1	12ELDY1	Čtyroký	2+0 z, zk	-	3	-
Basics of Artificial Intelligence	12ZUMI	Kléma, Štěpánková	-	2+2 z, zk	-	5
Image Processing and Pattern Recognition 1	01ROZ1	Flusser, Zitová	-	2+2 zk	-	4
Research Project 1, 2	12VUIF12	Liska	0+6 z	0+8 kz	6	8
Optional courses:						
Electrodynamics 2	12ELDY2	Čtyroký	-	4+0 z, zk	-	5
Variational Methods	01VAM	Beneš	2 zk	-	3	-
Finite Element Method	01MKP	Beneš	-	2 zk	-	3
Solid State Physics	11FYPL	Jelínek, Zajac	4+0 z, zk	-	4	-
Physics of High Energy Density	12FVHE	Drška	2+0 zk	-	2	-
Object Oriented Programming	18OOP	Virius	0+2 z	-	2	-
Computer Simulations in Physics of Many Particles 1, 2	12PEMC12	Kotrla, Předota	2+0 zk	2+0 zk	2	2
Parallel Algorithms and Architectures	01PAA	Oberhuber	-	3 kz	-	4
Inertial Fusion Physics	12FIF	Klimo, Limpouch	3+1 z, zk	-	4	-
Fundamentals of Laser-Plasma Physics	12ZFLP	Klimo, Pšikal	2+0 zk	-	2	-
Quantum Electronics	12KVEN	Richter	3+1 z, zk	-	5	-

Master Degree Program

Computational Physics

Year 2

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Atomic Physics	12AF	Šiňor	4+0 z, zk	-	4	-
Robust Numerical Algorithms	12RNA	Váchal	-	1+1 z	-	2
Diploma Seminar 1, 2	12DSEIF12	Limpouch	0+2 z	0+2 z	2	3
Master Thesis 1, 2	12DPIF12	Limpouch	0+10 z	0+20 z	10	20
Optional courses:						
Physics and Human Cognition	12FLP	Langer	-	2+0 z	-	2
Introduction to Management	12UM	Malát	2+0 zk	-	2	-
Monte Carlo Method	18MOCA	Virius	2+1 z	-	3	-
Mathematical Modelling of Non-linear Systems	01MMNS	Beneš	2 zk	-	3	-
Astrophysics	12ASF	Kulhánek	-	2+2 zk	-	4
X-ray Photonics	12RFO	Pína	2 zk	-	2	-
Neural Computers and Their Applications	01NSAP	Hakl, Holeňa	3+0 zk	-	4	-
Foundations of Fuzzy Logic	01ZFL	Cintula	2+0 zk	-	2	-

Master Degree Program

Applied Mathematical Stochastic Methods

Year 1

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Probability and Applied Statistics	18AST	Fabian	1+1 z, zk	-	3	-
Models and Methods for Economic Decisions	18MEK	Fiala	2+2 z, zk	-	5	-
Monte Carlo Method	18MOCA	Virius	2+1 z	-	3	-
Object Oriented Programming	18OOP	Virius	0+2 z	-	2	-
Soft Computing	18SOFC	Kukal	2+2 kz	-	4	-
Applied Econometrics and Time Series Theory	18AEK	Sekničková	2+2 z, zk	-	4	-
Software Engineering	18SWI	Merunka	2+2 kz	-	4	-
Modeling in UML	18MUML	Merunka	-	2+2 z, zk	-	4
Project Management of Economic Systems	18REK	Fiala	-	2+2 z, zk	-	4
Advanced Numerical Methods	01PNM	Beneš	-	2+0 kz	-	2
Fulltext Systems	18FULS	Liška	-	2+2 kz	-	4
Research Project 1, 2	18VUSE12	Kukal	0+6 z	0+8 kz	6	8
Optional courses:						
Programming for the .NET Framework	18NET	Virius	1+1 z, zk	-	2	-
Advanced Methods of Numerical Linear Algebra	01PNLA	Mikyška	2+0 zk	-	3	-
Matlab Applications	18AMTL	Kukal	-	2+2 kz	-	4
Database System Decomposition	18DATS	Kukal	-	2+2 kz	-	4
Resolution of Physical Issues	18RFP	Novotný	-	1+2 kz	-	3
Parallel Algorithms and Architectures	01PAA	Oberhuber	-	3 kz	-	4
Languages and Automata	01JAA	Mareš	-	2+0 zk	-	2
Bussiness Intelligence	18BI	Kukal	1+1 kz	-	2	-
Introduction to Advanced Algorithms 1	18UIA1	Jarý	1+1 z	-	2	-
Advanced Algorithms 2	18UIA2	Jarý	-	1+1 z	-	2
Introduction to Mainframe (1)	01UMF	Oberhuber	2 z	-	2	-
Mainframe Programming (1)	01PMF	Oberhuber	-	2 z	-	2
Mainframe Maintenance (1)	01SMF	Oberhuber	-	2 z	-	2

(1) Taught in cooperation with Computer Associates, ČR.

Master Degree Program

Applied Mathematical Stochastic Methods

Year 2

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Modeling of Production Systems in Economy	18MOPR	Sekničková	2+2 z, zk	-	5	-
Statistical Pattern Recognition and Decision Making Methods	18SROZ	Flusser	2+0 zk	-	3	-
Variational Methods B	01VAMB	Beneš	2 kz	-	2	-
Heuristic Algorithms	18HEUR	Kukal	-	2+2 kz	-	4
Background of Information Theory	18ZTI	Fabian	-	2+0 kz	-	2
Diploma Seminar 1, 2	18SDP12	Virius	0+2 z	0+2 z	2	3
Master thesis 1, 2	18DPSE12	Kukal	0+10 z	0+20 z	10	20
Optional courses:						
SQL Applications	18SQL	Kukal	0+2 z	-	2	-
Introduction to Graph Theory B	01ZTGB	Ambrož	2+2 z, zk	-	4	-
Complexity Theory	01TSLO	Majerech	3+0 zk	-	3	-
Financial and Insurance Mathematics	01FIMA	Hora	2+0 zk	-	2	-
Nonlinear Programming	01NELI	Burdík	3+0 zk	-	4	-
Probabilistic Learning Models	01PMU	Hakl	2+0 zk	-	2	-
Dynamic Decision Making	01DYR	Kárný	3+0 zk	-	3	-
Introduction to Management	12UM	Malát	2+0 zk	-	2	-
Theory of Random Processes	01NAH	Michálek, Veverka	3+0 zk	-	3	-
Methods for Sparse Matrices	01MRM	Mikyška	-	2+0 zk	-	2
Number Theory	01TC	Masáková, Pelantová	-	4+0 zk	-	4
Image Processing and Pattern Recognition 1	01ROZ1	Flusser, Zitová	-	2+2 zk	-	4
Industrial Software Development	18PVS	Virius	1+1 z	-	2	-

Master Degree Program

Nuclear Engineering

Year 1

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Nuclear Reactor Physics	17FAR	Heraltová, Zeman	2+2 z, zk	-	5	-
Core Physics and Fuel Management	17PRF	Kropík, Sklenka	-	2+0 z, zk	-	3
Reactor Dynamics	17DYR	Heřmanský, Huml	-	2+2 z, zk	-	4
Reactor Thermomechanics	17TERR	Bílý, Heřmanský	2+2 z, zk	-	4	-
Experimental Reactor Physics	17ERF	Rataj, Sklenka	-	4 kz	-	4
Nuclear Fuel Cycle	17JPC	Sklenka, Zeman	-	2+0 kz	-	2
Thermohydraulic Design of Nuclear Devices 4	17THNJ4	Kobylka	3+0 z, zk	-	4	-
Machines and Equipment of Nuclear Power Plants	17SAZ	Kobylka	-	2+1 z, zk	-	3
Foreign Short-Term Intership (1)	17PEX	Frýbort	-	2 týdny z	-	3
Research Project 1, 2	17VUJR12	Frýbort	0+6 z	0+8 kz	6	8
Optional courses:						
Nuclear Technology Devices	17PRJT	Kropík	2+0 zk	-	2	-
Computer Control of Experiments	17PRE	Kropík	2+1 z, zk	-	3	-
New Nuclear Sources	17NJZ	Bílý	3+0 zk	-	3	-
Computer Modelling in Nuclear Reactor Physics	17MORF1	Frýbort	-	2+2 kz	-	4
Digital Safety Systems of Nuclear Reactors	17CIBS	Kropík	2+0 z, zk	-	2	-
Exploration of Research Reactors (2)	17VYRR	Sklenka	-	2+0 zk	-	2
Energy Sector and Energy Sources (3)	17EEZ	Kobylka	-	2+1 z, zk	-	3
Selected Parts of Legislation (4)	17VPL	Bílková, Fuchsová	-	2+0 z	-	2
Economic Evaluation of Nuclear Power Plants (5)	17EHJE	Starý	2+0 zk	-	2	-
Materials Science for Reactors	14NMR	Haušild	-	2+0 zk	-	2

(1) For students of this field only.
(2) To be subsribed if not graded in 17VYR.
(3) To be subsribed if not graded in 17EZE.
(4) To be subsribed if not graded in 17ALE.
(5) To be subsribed if not graded in 17ZEH.

Master Degree Program

Nuclear Engineering

Year 2

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Spent Nuclear Fuel and Radioactive Waste (1)	17VPO	Konopásková	-	2 zk	-	2
Operator Course at VR-1 Reactor (2)	17OPK	Kropík, Rataj	4 z, zk	-	4	-
Nuclear Safety	17JBEZ	Heřmanský, Kříž	4+0 zk	-	4	-
Electrical Equipment of Nuclear Power Plants	17ELZ	Bouček, Kropík	2+1 z, zk	-	3	-
Pre-diploma Practice (3)	17DPRAX	Kropík	2 týdny z	-	2	-
Pre-diploma Seminar	17DSEM	Kropík	-	0+2 z	-	2
Master Thesis 1, 2	17DPJR12	Kropík	0+10 z	0+20 z	10	20
Optional courses:						
Computer Modelling in Nuclear Reactor Physics 2	17MORF2	Huml	2+2 kz	-	4	-
Reliability of Nuclear Power Plants (4)	17SPJE	Dušek, Matějka	2+0 zk	-	2	-
Simulation of NPP Operational States	17SIPS	Kobylka	0+3 kz	-	3	-
Control of Nuclear Power Plants (4)	17RJE	Kobylka	2+0 zk	-	2	-
Thermomechanics of Nuclear Fuel (5)	17TMP	Kobylka, Valach	-	2+1 z, zk	-	3
Radiation Protection of Nuclear Facilities	17ROJ	Starý	-	2+0 zk	-	2
Advanced Methods in Spent Fuel Reprocessing and Salt Reactor Technologies (4)	17PPSR	Uhlíř	-	2+1 zk	-	3

(1) To be subsribed if not graded in 17RAO.
(2) To be subsribed if graded in 17DYR a 17 ERF and not graded in 17OPKB.
(3) For students of this field only..
(4) Open for at least 3 students. It is mandatory to subscribe the course at least 3 days prior the semester beginning.
(5) To be subsribed if graded in 17TERR.

Master Degree Program

Dosimetry and Applications of Ionising Radiation

Year 1

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Monte Carlo Method	18MOCA	Virius	2+1 z	-	3	-
Nuclear Technology Devices	16ZJT	Čechák	2+0 zk	-	2	-
Practicum in Detection and Dosimetry of Ionizing Radiation	16PDZ	Průša	0+4 kz	-	5	-
Radiation Protection	16RAO	Vrba	4+0 zk	-	4	-
Instrumentation for Radiation Measurements	16MER	Voltr	2+0 zk	-	2	-
Introduction to Environment	16ZIVO	Čechák, Thinová	2+0 kz	-	2	-
Principles of Ionizing Radiation Application	16UAZ	Musílek	2+0 zk	-	2	-
Integral Dosimetry Methods	16IDOZ	Ambrožová, Musílek	-	2+0 zk	-	2
Applications of Ionizing Radiation in Science and Industry	16APLV	Čechák	-	4+0 zk	-	5
Monte Carlo Method in Radiation Physics	16MCRF	Klusoň	-	2+2 z, zk	-	4
Methods of Analytical Measurement	16AMM	Spěváček	-	2+0 zk	-	2
Dosimetry and Radioactivity of the Environment	16DRZP	Čechák, Thinová	-	2+0 zk	-	2
Excursion	16EX	Thinová	-	1 týden z	-	3
Seminar	16SEMA	Vávrů	-	0+2 z	-	2
Research Project 1, 2	16VUDZ12	Trojek	0+6 z	0+8 kz	6	8
Optional courses:						
Radiation Effects in Matter	16REL	Spěváček	2+0 zk	-	2	-
Treatment of Experimental Data	16ZED	Spěváček	2+0 zk	-	2	-
Experimental Methods of Nuclear Physics	02EMJF	Vrba	2+0 zk	-	3	-
Practicum in Dosimetry of Ionizing Radiation	16PDIZ	Thinová	-	0+4 kz	-	4

Master Degree Program

Dosimetry and Applications of Ionising Radiation

Year 2

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Medical Application of Ionizing Radiation	16AIZM	Novák	2+1 z, zk	-	3	-
Metrology of Ionizing Radiation	16MEIZ	Čechák	2+1 z, zk	-	4	-
Spectrometry in Dosimetry	16SPDO	Čechák	2+0 zk	-	3	-
Mathematical Methods and Modelling	16MMM	Klusoň	0+2 z	-	2	-
Microdosimetry	16MDOZ	Davídková	2+0 zk	-	2	-
Physics and Technic of the Nonionizing Radiation	16FNEI	Klusoň, Thinová	2+0 zk	-	2	-
Introduction to Particle Physics	16UCF	Smolík	2+0 zk	-	2	-
Seminar 1, 2	16SEM12	Vávrů	0+2 z	0+2 z	2	2
Master Thesis 1, 2	16DPDZ12	Vávrů	0+10 z	0+20 z	10	20
Optional courses:						
Neutron Dosimetry	16DNEU	Ploc	2+0 zk	-	2	-
Clinical Dosimetry	16KLD	Novotný	-	2+0 zk	-	2
Dosimetry of Internal Radiation Sources	16DZAR	Musílek	-	2+0 zk	-	2
Radiobiology	16RBIO	Davídková	-	2+0 zk	-	2
Practicum in Dosimetry of Ionizing Radiation	16PDIZ	Thinová	-	0+4 kz	-	4
Experimental Methods of Nuclear Physics	02EMJF	Vrba	2+0 zk	-	3	-
Radionuclides in the Environment	16RZP	Matolín, Thinová	-	2+0 zk	-	2
Introduction into Physics of Scintillators and Phosphors	16FSC	Nikl	-	2+0 zk	-	2

Master Degree Program

Experimental Nuclear and Particle Physics

Year 1

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Quantum Field Theory 1, 2	02KTPE12	Adam, Tolar	3+1 z	3+1 z, zk	5	5
Experimental Methods of Nuclear Physics	02EMJF	Vrba	2+0 zk	-	3	-
Experimental Methods of Subnuclear Physics	02EMSF	Adamová, Petráček	-	2+0 zk	-	2
Project Practicum 1, 2	02PPRA12	Čepila	0+2 z	0+4 kz	2	4
Physics of Atomic Nuclei	02FAJ	Adam, Mareš, Petráček	-	4+0 zk	-	4
Neutron Physics	02NF	Šaroun, Vacík	-	2+2 z, zk	-	4
Excursion	02EXK	Petráček	-	1 týden z	-	1
Research Project 1, 2	02VUEF12	Petráček	0+6 z	0+8 kz	6	8
Optional courses:						
Workshop on Experimental Nuclear Physics 2 (1)	02EJFS2	Petráček	5 dní z	-	1	-
Physics of Ultra-Relativistic Nuclear Collisions	02RFTI	Contreras	2+1 z, zk	-	3	-
Nuclear Technology Devices	16ZJT	Čechák	2+0 zk	-	2	-
Groups and Representations	02GR	Chadzitaskos	2+1 z, zk	-	3	-
Nuclear Technology Devices	17PRJT	Kropík	2+0 zk	-	2	-
Numerical Calculations in Quantum Mechanics 1, 2	02NVKM12	Adam	0+3 z	0+3 z	3	3
Embedded Systems in Nuclear Experiments	02EMBS	Kushpil	2+2 z	-	2	-
Extreme States of Matter	02ESH	Šumbera	-	2+0 z	-	2
Seminar on Quark-Gluon Plasma 3, 4	02RQGP34	Bielčík, Bielčíková, Tomášik	2+0 z	2+0 z	1	1
Statistical Physics in Nucleus-Nucleus Collisions	02SFHIC	Bielčík, Jex	2+1 z, zk	-	2	-
Statistical Data Processing	02SSD	Hájková	2+2 z, zk	-	4	-
Particle Accelerators	02UC	Doležal	2+0 zk	-	2	-
Materials in Experimental Nuclear Physics	02MAT	Škoda	2+0 zk	-	2	-
Space Radiation	02KZ	Nosek	-	2+0 zk	-	2
Lie Algebras and Lie Groups	02LIAG	Šnobl	-	3+2 z, zk	-	6
Programmable Logic Arrays	17PLP	Kropík	-	2+0 zk	-	2
Nuclear Astrophysics	02JAS	Nosek	2+0 zk	-	2	-
Path Integral	02DRI	Jizba	2+1 z, zk	-	3	-
Monte Carlo Method	18MOCA	Virius	2+1 z	-	3	-

(1) For students of this field only.

Master Degree Program

Experimental Nuclear and Particle Physics

Year 2

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Quantum Chromodynamics	02ZQCD	Bielčíková, Němčík, Tomášik	3+2 z, zk	-	6	-
Nuclear Spectroscopy	02JSP	Wagner	-	2+2 z, zk	-	5
Seminar 1, 2	02SEMI12	Petráček	0+2 z	0+2 z	2	3
Master Thesis 1, 2	02DPEF12	Petráček	0+10 z	0+20 z	10	20
Optional courses:						
Workshop on Experimental Nuclear Physics 3 (1)	02EJFS3	Petráček	5 dní z	-	1	-
Fundamentals of Electroweak Theory	02ZESI	Bielčíková, Tomášik	-	2+2 z, zk	-	4
Seminar on Quark-Gluon Plasma 5, 6	02RQGP56	Bielčík, Bielčíková, Tomášik	2+0 z	2+0 z	1	1
Computer Control of Experiments	17PRE	Kropík	2+1 z, zk	-	3	-
Experimental Tests of the Standard Model	02ETSM	Leitner	2+0 zk	-	2	-
Functional Integral 1, 2	02FCI12	Jizba	2+0 z	2+0 z	2	2
Instrumentation for Radiation Measurements	16MER	Voltr	2+0 zk	-	2	-

(1) For students of this field only.

Master Degree Program

Radiological Physics

Year 1

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
The Equations of Mathematical Physics [(1)]	01RMF	Krbálek	2+4 z, zk	-	6	-
Probability and Statistics	01PRST	Hobza	3+1 z, zk	-	4	-
Numerical Methods 2	01NME2	Beneš	-	2+0 kz	-	2
Quantum Physics	02KF	Jizba, Šnobl	2+1 z, zk	-	3	-
Nuclear and Radiation Physics 1, 2	16JRF12	Musílek, Urban	4+2 z, zk	2+2 z, zk	6	4
Fundamentals of Human Biology, Anatomy and Physiology 1, 2	16ZBAF12	Doubková	2+2 z, zk	2+2 z, zk	4	4
Fundamentals of Radiation Dosimetry 1, 2	16ZDOZ12	Trojek	2+2 z, zk	2+0 zk	4	2
Detectors of Ionizing Radiation	16DETE	Průša	-	4+0 zk	-	4
Clinical Propaedeutic	16KPR	Votrubová	2+0 zk	-	2	-
Elementary Labs	16ZPRA	Průša	-	0+2 kz	-	2
Search Project 1, 2	16RPRF12	Vávrů	0+5 z	0+10 z	5	10
Optional courses:						
Basic to Solid State Physics	11ZFPL	Kraus	2+0 kz	-	2	-
Quantum Mechanics [(2)]	02KVAN	Hlavatý, Štefaňák	4+2 z, zk	-	6	-

(1) Grading in 01RMF only when graded in Calculus and Linear Algebra.
(2) Alternative to 02KF.

Master Degree Program

Radiological Physics

Year 2

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Nuclear Technology Devices	16ZJT	Čechák	2+0 zk	-	2	-
Integral Dosimetry Methods	16IDOZ	Ambrožová, Musílek	-	2+0 zk	-	2
Instrumentation for Radiation Measurements	16MER	Voltr	2+0 zk	-	2	-
Monte Carlo Method in Radiation Physics	16MCRF	Klusoň	-	2+2 z, zk	-	4
Image Processing and Pattern Recognition 1	01ROZ1	Flusser, Zitová	-	2+2 zk	-	4
Introduction to Quality Management in Health Care	16USRJ	Pešek	1+1 z	-	2	-
Ethics in Health Care	16EZ	Příhoda	1+0 z	-	1	-
Hygiene a Epidemiology	16HE	Lohynská	1+0 z	-	1	-
Biochemistry and Pharmacology	16BAF	Kovář	2+0 zk	-	2	-
Radiation Protection	16RAO	Vrba	4+0 zk	-	4	-
Medical Informatics	16INZ	Klusoň	1+1 kz	-	2	-
Basics of First Aid	16ZPP	Málek	0+2 z	-	2	-
Treatment of Experimental Data	16ZED	Spěváček	2+0 zk	-	2	-
Radiological Physics - Diagnostic Radiology	16RFRD	Novák	2+1 z, zk	-	3	-
Radiological Physics - Nuclear Medicine	16RFNM	Trnka	-	2+1 z, zk	-	3
Radiobiology	16RBIO	Davídková	-	2+0 zk	-	2
Radiological Physics - Radiotherapy 1	16RFRT1	Koniarová	-	2+1 z, zk	-	3
Pathology, Anatomy, and Physiology in Imaging Techniques 1	16PAFZ1	Válek	-	2+0 zk	-	2
Seminar	16SEMA	Vávrů	-	0+2 z	-	2
Excursion	16EX	Thinová	-	1 týden z	-	3
Research Project 1, 2	16VURF12	Trojek	0+6 z	0+8 kz	6	8
Optional courses:						
Principles of Ionizing Radiation Application	16UAZ	Musílek	2+0 zk	-	2	-
Methods of Analytical Measurement	16AMM	Spěváček	-	2+0 zk	-	2
Applications of Ionizing Radiation in Science and Industry	16APLV	Čechák	-	4+0 zk	-	5

Master Degree Program

Radiological Physics

Year 3

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Radiological Physics - Radiotherapy 2	16RFRT2	Koniarová	2+1 z, zk	-	3	-
Pathology, Anatomy, and Physiology in Imaging Techniques 2	16PAFZ2	Válek	2+0 zk	-	2	-
Clinical Dosimetry	16KLD	Novotný	-	2+0 zk	-	2
Nuclear Medicine - Clinical Training	16NMKP	Čechák	2 týd z	-	4	-
X-Ray Diagnostics - Clinical Training	16RDKP	Čechák	2 týd z	-	4	-
Radiotherapy- Clinical Training	16RTKP	Čechák	-	2 týd z	-	4
Practicum in Detection and Dosimetry of Ionizing Radiation	16PDZ	Průša	0+4 kz	-	5	-
Metrology of Ionizing Radiation	16MEIZ	Čechák	2+1 z, zk	-	4	-
Technical and Health-Care Regulations	16TZP	Závoda	-	2+0 z	-	2
Seminar 1, 2	16SEM12	Vávrů	0+2 z	0+2 z	2	2
Master Thesis 1, 2	16DPRF12	Vávrů	0+10 z	0+20 z	10	20
Optional courses:						
Image Processing and Pattern Recognition 2	01ROZ2	Flusser	2+1 zk	-	3	-
Spectrometry in Dosimetry	16SPDO	Čechák	2+0 zk	-	3	-
Dosimetry of Internal Radiation Sources	16DZAR	Musílek	-	2+0 zk	-	2
Microdosimetry	16MDOZ	Davídková	2+0 zk	-	2	-
Radiation Effects in Matter	16REL	Spěváček	2+0 zk	-	2	-
Neutron Dosimetry	16DNEU	Ploc	2+0 zk	-	2	-
Monte Carlo Method	18MOCA	Virius	2+1 z	-	3	-

Master Degree Program

Solid State Engineering

Year 1

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Semiconductor Physics 1	11POL1	Potůček	4+0 zk	-	6	-
Physics of Magnetic Materials	11MAGN	Zajac	-	2+0 zk	-	3
Physics of Metals	11KOV	Lejček	2+0 zk	-	3	-
Physics of Dielectrics	11DIEL	Bryknar	-	2+0 zk	-	3
Diploma Seminar 1, 2	11SMI12	Kraus, Vratislav	0+2 z	0+2 z	3	3
Solid State Theory 1	11TPL1	Zajac	4+0 zk	-	6	-
Solid State Theory 2	11TPL2	Zajac	-	2+0 zk	-	3
Research Project 1, 2	11VUIP12	Vratislav	0+6 z	0+8 kz	6	8
Optional courses:						
Real Time Software	11RTSW	Jiroušek	-	2+0 z	-	3
Practical Exercises from Solid State Structure Analysis	11PSPL	Ganev, Vratislav	0+4 kz	-	4	-
Semiconductor Physics 2	11POL2	Aubrecht	-	2+0 zk	-	2
Practical Training of Semiconductors	11PPOL	Aubrecht, Klepáček, Potůček	-	0+4 kz	-	4
Superconductivity and Low Temperature	11SUPR	Janů, Středa	4+0 zk	-	4	-
Measuring Methods of Semiconductors	11MMPV	Aubrecht, Klepáček	2+0 z	-	2	-
Construction of Semiconductor Devices	11KPS	Sopko	-	2+0 zk	-	2
Chemical Aspects of Solids	11CHA	Hejtmánek	-	2+0 zk	-	2
Technology of Microwave and Optoelectronic Devices	11TVOS	Sopko	-	2+0 zk	-	2
Practical Training in Electronics	11EP	Jiroušek	0+4 kz	-	4	-
Metallic Oxides	11KO	Hejtmánek	2+0 zk	-	2	-
Physics of Solid State Phase Transitions	11FPPL	Hlinka	-	2+0 zk	-	2
Applied Neutron Diffractometry	11AND	Vratislav	2+0 zk	-	2	-
Diffraction Methods of Structural Biology	11DMSB	Dohnálek	-	3 z, zk	-	3
Quantum Computation	11KVAP	Andrey	-	2+0 zk	-	2
Molecular Nanosystems	11MONA	Kratochvílová	2+0 zk	-	2	-
Optical Spectroscopy of Inorganic Solids	11OSAL	Potůček	-	2+0 zk	-	2
Languages and Automata	01JAA	Mareš	-	2+0 zk	-	2
Computability and Mathematical Logic	01VYML	Mareš	4+0 zk	-	4	-

Master Degree Program

Solid State Engineering

Year 2

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Optical Properties of Solids	11OPT	Bryknar	2+0 zk	-	3	-
Professional Practice	11PRAK	Vratislav	2 týdny z	-	5	-
Diploma Seminar 3, 4	11SMI34	Kraus, Vratislav	0+2 z	0+2 z	2	3
Master Thesis 1, 2	11DPIP12	Vratislav	0+10 z	0+20 z	10	20
Optional courses:						
Special Semiconductor Materials and Devices	11SMAT	Sopko	2+0 zk	-	2	-
Modern Measuring Methods in Physics	11MMM	Vratislav	4+0 z	-	4	-
Surface Physics 1, 2	11FYPO12	Kalvoda	2+0 zk	2+0 zk	2	2
Semicoductor Detectors	11DETE	Sopko	-	2+0 zk	-	2
Theory and Construction of Photovoltaic Cells	11PCPC	Pfleger	2+0 zk	-	2	-
Neutronography in Material Research	11NMV	Vratislav	-	2+0 zk	-	2
Diffraction Analysis of Mechanical Stress	11DAN	Ganev, Kraus	2+0 zk	-	2	-
Introduction into the Chemistry and Physics of Polymer Materials	11CFPL	Lukáš	-	2+0 zk	-	2
Smart Materials and Their Applications	11SMAM	Potůček, Sedlák	2+0 zk	-	2	-
Computer Simulation of Condensed Matter	11SIKL	Kalvoda, Sedlák	-	2+2 z, zk	-	4
Principles and Applications of Optical Sensors with Practical Trainings	11PAO	Aubrecht, Klepáček	2+0 zk	-	2	-
Seminar in Solid State Theory	11STPL	Štěpánková	-	0+2 kz	-	2
Intrinsic Dynamics of Materials	11VDYM	Seiner	2+0 z	-	3	-

Master Degree Program

Diagnostics of Materials

Year 1

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Dynamics of Continuum	14DYKO	Horáček	2+0 z, zk	-	3	-
Fracture Mechanics 1, 2	14LME12	Kunz	2+0 z, zk	2+0 z, zk	3	3
Analysis of Experimental Data 1, 2	14AED12	Kopřiva	2 z, zk	2 z, zk	3	3
Experimental Methods 1, 2	14EXM12	Jaroš, Kovářík, Nedbal, Siegl	4 kz	4 kz	4	4
Physical Metallurgy 1, 2	14FYM12	Chráska, Karlík	4 z, zk	2+0 z, zk	6	3
Plasticity 1	14PLAS1	Oliva	-	2+0 z, zk	-	3
Fatigue of Materials	14UNMA	Lauschmann	-	2+0 kz	-	3
Research Project 1, 2	14VUSM12	Kopřiva	0+6 z	0+8 kz	6	8
Optional courses:						
Elasticity 2	14EME2	Materna, Oliva	4 z, zk	-	6	-
Computational Mechanics	14PME	Okrouhlík	-	3 kz	-	4
Variational Methods B	01VAMB	Beneš	2 kz	-	2	-

Master Degree Program

Diagnostics of Materials

Year 2

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Non-Metallic Materials	14NEKO	Haušild, Karlík	2+0 z, zk	-	3	-
Plasticity 2	14PLAS2	Oliva	2+0 z, zk	-	4	-
Theory of Reliability	14TSPO	Kopřiva	2+0 z, zk	-	3	-
Practicum in Finite Elements Methods	14PMKP	Materna	0+2 kz	-	3	-
Nondestructive Diagnostics	14NEDI	Převorovský	2 z	-	3	-
Intrinsic Dynamics of Materials	11VDYM	Seiner	2+0 z	-	3	-
Pre-diploma Practice	14PRAXE	Oliva	2 týdny z	-	4	-
Master Thesis 1, 2	14DPSM12	Oliva	0+10 z	0+20 z	10	20
Optional courses:						
Wave Phenomena in Solids	14VLN	Červ	2+0 z	-	3	-
Seminar	14SEM	Siegl	-	0+4 z	-	8
Fractography and Failure Analysis	14FAP	Siegl	-	2+0 z	-	3

Master Degree Program

Laser Technology and Electronics

Year 1

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Electrodynamics 1, 2	12ELDY12	Čtyroký	2+0 z, zk	4+0 z, zk	3	5
Optical Physics 1	12FOPT1	Fiala	3+0 z, zk	-	3	-
Nonlinear Optics (2)	12NLOP	Fiala, Richter	-	3+1 z, zk	-	5
Quantum Electronics (1)	12KVEN	Richter	3+1 z, zk	-	5	-
Solid State Physics	11FYPL	Jelínek, Zajac	4+0 z, zk	-	4	-
Laser Physics	12FLA	Šulc	-	4 z, zk	-	4
Open Resonators	12ORE	Kubeček	2+1 z, zk	-	3	-
Solid-state, Diode and Dye lasers	12PDBL	Jelínková, Kubeček	-	2+0 z, zk	-	2
Measurements Methods in Electronics and Optics	12MMEO	Pína	-	2+0 zk	-	2
Electronics 3	12EL3	Pavel	2+0 zk	-	2	-
Electronics Practicum 1, 2	12EP12	Pavel	0+2 kz	0+2 kz	3	3
Research Project 1, 2	12VULT12	Jelínková	0+6 z	0+8 kz	6	8
Optional courses:						
Statistical Optics	12SOP	Richter	2+0 z, zk	-	2	-
Optical Physics 2	12FOPT2	Škereň	-	2+0 z, zk	-	2
Geometrical Optics	12GEOP	Fiala	-	3+1 z, zk	-	4
Optical Spectroscopy	12OPS	Michl	-	2+0 zk	-	2
Physics of Detection and Detectors of Optical Radiation	12FDD	Pína	2+0 zk	-	2	-
X-ray Photonics	12RFO	Pína	2 zk	-	2	-
Differential Equations on Computer	12DRP	Liska	2+2 z, zk	-	5	-
Fundamentals of Laser-Plasma Physics	12ZFLP	Klimo, Pšikal	2+0 zk	-	2	-

(1) Grading in 12KVEN possible after grading in 02KVAN.
(2) Grading in 12NLOP possible after grading in 12FOPT1.

Master Degree Program

Laser Technology and Electronics

Year 2

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Fiber Lasers and Amplifiers	12VLA	Kubeček, Peterka	3 zk	-	3	-
Ultra-short Pulse Generation	12UKP	Kubeček	2+0 zk	-	2	-
Advanced Laser Technique Laboratory	12PPLT	Kubeček, Němec	0+4 kz	-	6	-
Optical Sensors	12OSE	Homola	-	2+0 zk	-	2
Gas and X-ray Lasers	12RTGL	Jančárek, Jelínková	-	2+0 z, zk	-	2
Laser, Plasma and Beam Technologies	12LPST	Jančárek, Jelínková, Král	-	2+2 zk	-	4
Diploma Seminar 1, 2	12DSELT12	Jelínková	0+2 z	0+2 z	2	3
Master Thesis 1, 2	12DPLT12	Jelínková	0+10 z	0+20 z	10	20
Optional courses:						
Electronics for Lasers	12ELA	Čech, Pavel	2+0 zk	-	2	-
Computer Control of Experiments	12POEX	Čech	-	2+0 z	-	2
Advanced Laser Spectroscopy (1)	12PLS	Michl	2+0 zk	-	2	-
Fourier Optics and Optical Signal Processing	12OZS	Škereň	3+0 z, zk	-	3	-
Selected Chapters of Modern Optics	12MODO	Květoň	2+0 z	-	2	-
Advanced Optical Laboratory (2)	12PPOP	Škereň	0+4 kz	-	4	-

(1) Grading in 12PLS possible after grading in 12OPS.
(2) Subscription of 12PPOP possible after grading in 12FOPT1 and 12FOPT2.

Master Degree Program

Optics and Nanostructures

Year 1

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Electrodynamics 1, 2	12ELDY12	Čtyroký	2+0 z, zk	4+0 z, zk	3	5
Solid State Physics	11FYPL	Jelínek, Zajac	4+0 z, zk	-	4	-
Optical Physics 1, 2	12FOPT12	Fiala, Škereň	3+0 z, zk	2+0 z, zk	3	2
Quantum Electronics (1)	12KVEN	Richter	3+1 z, zk	-	5	-
Nonlinear Optics (2)	12NLOP	Fiala, Richter	-	3+1 z, zk	-	5
Statistical Optics	12SOP	Richter	2+0 z, zk	-	2	-
Optical Spectroscopy	12OPS	Michl	-	2+0 zk	-	2
Nanoscopy and Nanocharacterization	12NAN	Fejfar	2+0 zk	-	2	-
Surfaces and Boundaries	11POR	Kalvoda	-	2+0 zk	-	2
Research Project 1, 2	12VUOF12	Škereň	0+6 z	0+8 kz	6	8
Optional courses:						
Geometrical Optics	12GEOP	Fiala	-	3+1 z, zk	-	4
Quantum Optics (3)	12KVO	Richter	-	3+1 z, zk	-	4
Measurements Methods in Electronics and Optics	12MMEO	Pína	-	2+0 zk	-	2
Physics of Detection and Detectors of Optical Radiation	12FDD	Pína	2+0 zk	-	2	-
Laser Physics	12FLA	Šulc	-	4 z, zk	-	4
Open Resonators	12ORE	Kubeček	2+1 z, zk	-	3	-
Solid-state, Diode and Dye lasers	12PDBL	Jelínková, Kubeček	-	2+0 z, zk	-	2
Electronics 3	12EL3	Pavel	2+0 zk	-	2	-
Electronics Practicum 1, 2	12EP12	Pavel	0+2 kz	0+2 kz	3	3
Fiber Lasers and Amplifiers	12VLA	Kubeček, Peterka	3 zk	-	3	-
Nanochemistry	12NCH	Proška	2+0 zk	-	2	-
Optical Semiconductors Properties	12OVP	Oswald	2+0 zk	-	2	-
Preparation of Semiconductor Nanostructures	12PN	Hulicius	-	2+0 zk	-	2
Selected Nanostructures Chapters	12VKN	Hulicius	-	2 kz	-	2
Fundamentals of Laser-Plasma Physics	12ZFLP	Klimo, Pšikal	2+0 zk	-	2	-
Atomic Physics	12AF	Šiňor	4+0 z, zk	-	4	-
Concepts of Information Physics 1, 2	12KOF12	Drška, Kuchařík, Šiňor	2+0 z	2+0 zk	3	3
Differential Equations on Computer	12DRP	Liska	2+2 z, zk	-	5	-

(1) Grading in 12KVEN possible after grading in 02KVAN.
(2) Grading in 12NLOP possible after grading in 12FOPT1.
(3) Grading in 12KVO possible after grading in 12KVEN.

Master Degree Program

Optics and Nanostructures

Year 2

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Integrated Optics	12INTO	Čtyroký	2+0 z, zk	-	2	-
Fourier Optics and Optical Signal Processing	12OZS	Škereň	3+0 z, zk	-	3	-
X-ray Photonics	12RFO	Pína	2 zk	-	2	-
Nanophysics	12NF	Richter, Šiňor	2+0 zk	-	2	-
Optical Sensors	12OSE	Homola	-	2+0 zk	-	2
Advanced Optical Laboratory (2)	12PPOP	Škereň	0+4 kz	-	4	-
Diploma Seminar 1, 2	12DSEOF12	Jelínková	0+2 z	0+2 z	2	3
Master Thesis 1, 2	12DPOF12	Škereň	0+10 z	0+20 z	10	20
Optional courses:						
Selected Chapters of Modern Optics	12MODO	Květoň	2+0 z	-	2	-
Excursions to Optical Workplaces	12EOP	Bodnár	0+4 z	-	4	-
Advanced Laser Spectroscopy (1)	12PLS	Michl	2+0 zk	-	2	-
Computer Control of Experiments	12POEX	Čech	-	2+0 z	-	2
Ultra-short Pulse Generation	12UKP	Kubeček	2+0 zk	-	2	-
Laser, Plasma and Beam Technologies	12LPST	Jančárek, Jelínková, Král	-	2+2 zk	-	4
Gas and X-ray Lasers	12RTGL	Jančárek, Jelínková	-	2+0 z, zk	-	2
Electronics for Lasers	12ELA	Čech, Pavel	2+0 zk	-	2	-
Advanced Laser Technique Laboratory	12PPLT	Kubeček, Němec	0+4 kz	-	6	-
Nanoelectronics	12NAE	Voves	2+0 zk	-	2	-
Spontaneously-grown Structures of Selected Nanomaterials	12SRS	Bouda	2+0 kz	-	2	-
Physics of Magnetic Materials	11MAGN	Zajac	-	2+0 zk	-	3
Computer Simulation of Condensed Matter	11SIKL	Kalvoda, Sedlák	-	2+2 z, zk	-	4
Introduction into the Chemistry and Physics of Polymer Materials	11CFPL	Lukáš	-	2+0 zk	-	2
Physics and Human Cognition	12FLP	Langer	-	2+0 z	-	2
Introduction to Management	12UM	Malát	2+0 zk	-	2	-
Inertial Fusion Physics	12FIF	Klimo, Limpouch	3+1 z, zk	-	4	-

(1) Grading in 12PLS possible after grading in 12OPS.
(2) Grading in 12PPOP possible after grading in 12FOPT1 and 12FOPT2.

Master Degree Program

Physics and Technology of Thermonuclear Fusion

Year 1

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Plasma Theory 1, 2	02TPLA12	Kulhánek	2+2 z, zk	3+1 z, zk	5	5
Plasma Diagnostics	02DPLA	Kubeš	-	2+1 z, zk	-	3
Computer Modelling of Plasma	02PMPL	Plašil	-	2+1 z, zk	-	3
Technology of Thermonuclear Facilities	02TTJZ	Ďuran, Žáček	-	3+0 zk	-	3
Inertial Fusion Physics (1)	12FIF	Klimo, Limpouch	3+1 z, zk	-	4	-
Physics of Tokamaks (1)	02FT	Mlynář	3+1 z, zk	-	4	-
Atomic and Molecular Physics	02AMF	Břeň	2+2 z, zk	-	4	-
Materials Science for Reactors	14NMR	Haušild	-	2+0 zk	-	2
Laboratory Work in Plasma Physics 1, 2	02PRPL12	Svoboda	0+2 z	0+2 kz	2	2
Research Project 1, 2	02VUTF12	Svoboda	0+6 z	0+8 kz	6	8
Optional courses:						
Topics in Magnetic Confinement Fusion	02PMCF	Mlynář	-	0+2 kz	-	2
Inertial Confinement Fusion	12PICF	Klír, Limpouch	-	2+0 kz	-	2
Superconductivity and Low Temperature	11SUPR	Janů, Středa	4+0 zk	-	4	-
Low Temperature Plasmas and Discharges	12NIPL	Král	4+0 z, zk	-	4	-
Differential Equations on Computer	12DRP	Liska	2+2 z, zk	-	5	-
Computer Control of Experiments	12POEX	Čech	-	2+0 z	-	2
Neutron Physics	02NF	Šaroun, Vacík	-	2+2 z, zk	-	4
Optical Spectroscopy	12OPS	Michl	-	2+0 zk	-	2
Nuclear Technology Devices	16ZJT	Čechák	2+0 zk	-	2	-
Nuclear Technology Devices	17PRJT	Kropík	2+0 zk	-	2	-
Winter (Summer) School of Plasma Physics and Fusion Physics 1, 2 (2)	02ZLSTF12	Svoboda	1 týden z	1 týden z	1	1

(1) At least one must be selected.
(2) For students of this field only.

Master Degree Program

Physics and Technology of Thermonuclear Fusion

Year 2

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Seminar 1, 2	02STF12	Limpouch, Mlynář	0+2 z	0+2 z	2	3
ITER and the Accompanying Programme (1)	02ITER	Mlynář	2+0 zk	-	3	-
Pinches (1)	02PINC	Kubeš	2+0 zk	-	3	-
Physics and Human Cognition	12FLP	Langer	-	2+0 z	-	2
Master Thesis 1, 2	02DPTF12	Svoboda	0+10 z	0+20 z	10	20
Optional courses:						
Mathematical Modelling of Non-linear Systems (1)	01MMNS	Beneš	2 zk	-	3	-
History, Social and Economical Aspects of Fusion	02HSEF	Řípa	1+0 kz	-	2	-
Computer Simulations in Physics of Many Particles 1, 2	12PEMC12	Kotrla, Předota	2+0 zk	2+0 zk	2	2
Neutron Dosimetry	16DNEU	Ploc	2+0 zk	-	2	-
Introduction to Environment	16ZIVO	Čechák, Thinová	2+0 kz	-	2	-
Introduction to Management	12UM	Malát	2+0 zk	-	2	-
Radiation Effects in Matter	16REL	Spěváček	2+0 zk	-	2	-
Numerical simulations of Convection problems	01NSPP	Kozel	-	1+1 zk	-	2
Astrophysics	12ASF	Kulhánek	-	2+2 zk	-	4

(1) At least one must be selected.

Master Degree Program

Nuclear Chemistry

Year 1

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Separation Methods in Nuclear Chemistry 1	15SMJ1	John, Němec	3+0 zk	-	3	-
Radiation Chemistry	15RACH	Motl	-	3+0 zk	-	4
Radioanalytical Methods	15RAM	John	-	3+0 zk	-	3
Trace Radiochemistry	15STP	Beneš	-	3+0 zk	-	3
Physical Chemistry 3	15FCHN3	Čuba	1+1 z, zk	-	2	-
Physical Chemistry 4	15FCHN4	Múčka, Silber	-	3+2 z, zk	-	5
Practical Exercises in Separation Methods (1)	15SEPM	Čubová, John, Němec	0+3 kz	-	3	-
Practical Exercises in Radiation Chemistry (2)	15PRACH	Bárta, Čuba	-	0+3 kz	-	3
Practical Exercises in Nuclear Chemistry	15PJCH	Čubová, Němec	0+4 kz	-	4	-
Environment Chemistry and Radioecology	15RAEK	Beneš	2+0 zk	-	2	-
Internship	15PRAKN	Čuba	-	2 týdny z	-	4
Excursion 2	15EXK2	Čubová	-	5 dnů z	-	1
Research Project 1, 2	15VUCH12	Čuba	0+6 z	0+8 kz	6	8
Optional courses:						
Physical Chemistry 5	15FCH5	Silber	2+0 zk	-	2	-
Statistical Methods with Applications	01SM	Hobza	-	2+0 zk	-	2
Introduction to Photochemistry and Photobiology	15UFCB	Čubová, Juha	2+0 zk	-	2	-
Practical Exercises in Radioanalytical Methods (3)	15PRAM	Čubová, John, Němec	-	0+4 kz	-	4
The Chemistry of Operation of Nuclear Power Plants (4)	15CHJE	Silber, Štamberg	2+0 zk	-	2	-
Application of Radiation Methods (4)	15APRM	Múčka	-	2+0 zk	-	2
Protection of Environment (5)	15ZOCH	Filipská	2+0 zk	-	2	-
Modelling of Migration Processes in Environment (5)	15MMPR	Štamberg, Vopálka	-	2+0 zk	-	2
Radiation Methods in Biology and Medicine (6)	15RMBM	Čuba	-	2+0 zk	-	2
Radiopharmaceuticals 1 (6)	15RDFM	Lebeda	2+0 zk	-	2	-
Practical Exercises in Radiation Methods in Biology and Medicine (6,7)	15PRMB	Kozempel, Vlk	-	0+4 kz	-	4
Practical Exercises in Microbiology (6)	15LMB	Demnerová	0+6 kz	-	4	-
Structural Analysis (5)	15STA	Böhm	-	2+1 z, zk	-	3
Toxicology (5)	15TOX	Nesměrák	2+0 zk	-	2	-

(1) Subscription of 15SEPM requires grading in 15SMJ1.
(2) Subscription of 15PRACH requires simultaneous subsription of 15RACH.
(3) Subscription of 15PRAM requires grading in 15RAM.
(4) Subscription of these courses recommended when the master thesis is related to the applied nuclear chemistry.
(5) Subscription of these courses recommended when the master thesis is related to the environmental chemistry and radioecology.
(6) Subscription of these courses recommended when the master thesis is related to the nuclear chemistry in biology and medicine.
(7) Subscription of 15PRMB requires grading in 15RMBM.

Master Degree Program

Nuclear Chemistry

Year 2

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Radionuclide Production	15PRN	Lebeda	2+0 zk	-	2	-
Seminar 1, 2	15SEM12	Čubová	0+4 z	0+4 z	4	4
Master Thesis 1, 2 (1)	15DPCH12	Beneš	0+10 z	0+20 z	10	20
Optional courses:						
Chemistry of Radioactive Elements	15CHRP	John	2+0 zk	-	2	-
Separation Methods in Nuclear Chemistry 2 (2)	15SMJ2	John, Němec	-	2+0 zk	-	2
Instrumental Methods 2	15INS2	Pospíšil	2+0 zk	-	2	-
Application of Radionuclides 1 (3)	15NUK1	Mizera	2+0 zk	-	3	-
Application of Radionuclides 2 (3)	15NUK2	Mizera	-	2+0 zk	-	3
Technology of Fuel Cycles of Nuclear Power Stations (3)	15TPC	Drtinová, Štamberg	2+0 zk	-	2	-
The Chemistry of Operation of Nuclear Power Plants (3)	15CHJE	Silber, Štamberg	2+0 zk	-	2	-
Waste Management and Treatment (3)	15TZO	Kubal	2+0 zk	-	2	-
Nuclear Materials Technology (3)	15TJM	Drtinová, Štamberg	-	2+0 zk	-	2
Hydrochemistry (4)	15HCHE	Sýkora	2+0 zk	-	2	-
Waste Analysis (4)	15AODP	Janků	2+0 zk	-	2	-
Numerical Simulation of Complex Environmental Processes (4)	15VSBP	Vopálka	1+1 zk	-	2	-
Hydrology and Pedology (4)	15HYPE	Pokorná	2+0 zk	-	2	-
Determination of Radionuclides in Environment (4)	15SRZP	Němec	-	2+0 zk	-	2
Immunochemistry (5)	15IMCH	Pompach	-	2+0 zk	-	3
Chemistry of the Pharmaceuticals (5)	15CHL1	Smrček	2+0 zk	-	3	-
Radiobiology (5)	16RBIO	Davídková	-	2+0 zk	-	2
General Pharmacology (5)	15OFKL	Kršiak	2+0 zk	-	2	-
Immunopathology (5)	15IMPL	Kučera	2+0 zk	-	2	-
Biochemistry and Pharmacology (5)	16BAF	Kovář	2+0 zk	-	2	-
Radiation Protection (5)	16RAO	Vrba	4+0 zk	-	4	-
Radiopharmaceuticals 2 (5)	15RFM2	Kozempel, Moša, Vlk	2+0 zk	-	2	-
Theoretical Basics of Radiation Chemistry (3,5)	15TZRCH	Juha	2+0 zk	-	2	-

(1) Initiation of diploma project requires grading in 15VUCH2.
(2) Grading in 15SMJ2 requires grading in 15SMJ1.
(3) Subscription of these courses recommended when the master thesis is related to the applied nuclear chemistry.
(4) Subscription of these courses recommended when the master thesis is related to the environmental chemistry and radioecology.
(5) Subscription of these courses recommended when the master thesis is related to the nuclear chemistry in biology and medicine.

EXPLANATORY NOTES

for notations in the curriculum

The curriculum contains in each row

- course name
- shortcut used in the university database KOS
- name of the lecturer
- extent in the winter and summer semester
- credits in the winter and summer semester

In case the course spans over two semesters with different parts denoted by numbers, they can be contained in one row.

The extent of the course is indicated by number of teaching hours of the lecture + number of teaching hours of the lecture together with the indication of the grading (see later i nthis text). In case the teaching hours of the lecture and exercise are not distinguished, the course extent is indicated by one number.

POLICIES AND PROCEDURES FOR THE BACHELOR AND MASTER COURSES AT THE FACULTY OF NUCLEAR SCIENCES AND PHYSICAL ENGINEERING (FNSPE) OF THE CZECH TECHNICAL UNIVERSITY (CTU) IN PRAGUE

The Policies and Procedures of the FNSPE of the CTU in Prague represent the fundamental document for the study programmes offered by this institution, complementing and specifying the requirements of the CTU Academic and Examination Statute. This document is binding on all academics and students. Study programmes of FNSPE are structured, providing not only the established engineering (i.e. master) courses but also undergraduate (i.e., bachelor) training. The study programmes comprise various branches of study which may comprise various specializations.

Compliant with the CTU Academic and Examination Statute, Sec.7, Par.4, the undergraduate and master programmes study plans of branches and specialisations specify the required compulsory courses as well as optional courses recommended for the respective branch of study.

Section 1

Bachelor (undergraduate) Study Programme

1. Curricula in the bachelor degree program contain the bachelor compulsory and optional courses.
2. In the bachelor degree program, it is not allowed to subscribe into the courses of the master degree program with exception given by Sec. 2, Par. 4 a., b, d.

Section 2

Master Continuation Study Programme (MCSP)

1. Curricula in the master degree program contain the master compulsory and optional courses. In the master degree program, it is not allowed to subscribe into the courses of the bachelor degree program.
2. To be elgibile for the MCSP, (in terms of conditions set by law and the CTU Entrance Procedures), all applicants are required to have completed a bachelor programme in a related or identical branch of study as well as to have successfully passed the entrance examination. However, the student may be exempt from the examination on the Dean´s recommendation.
3. If necessary, for the first two years, the student on the MCSP will have and individual schedule, so as to attain the competences required for the completed bachelor specialisation.
4. To transfer from the Bachelor Programme to the MCSP, the following rules are imposed:
    a. In the bachelor degree program, it is possible to subscribe into the courses in the recommended 1st year MCSP study plan (except of the degree Radiological Physics) provided the credits obtained do not excceed the total amount of 30. Such credits must be obtained beyond the limit of 180 credits obtained in the bachelor study.
    b. Provided the student has graduated from a bachelor course at FNSP and transfers to the MCSP (except of the degree Radiological Physics), on application courses listed in the recommended 1st year MCSP study plan can be counted for up to 30 credits if obtained beyond the mandatory minimum of 180 credits as required for the bachelor programme by the CTU Academic and Examination Statute
    c. The MCSP will not recognize courses taken within the bachelor programme beyond those recommended by the plan of a given field/specialisation.

d. In the bachelor degree program, it is possible to subscribe into the courses in the recommended 2nd year MCSP study plan of the degree Radiological Physics provided the credits obtained do not excceed the total amount of 30. Such credits must be obtained beyond the limit of 180 credits obtained in the bachelor study. Provided the student subscribes into the field of Radiological Physics after graduating at the FNSPE CTU bachelor course, on application courses listed in the recommended 1st year MCSP study plan can be counted for up to 60 local credits if included in the 3-rd year recommended bachelor programme study plan, and courses listed in the recommended 2nd year MCSP study plan can be counted for up to 30 credits if obtained beyond the mandatory minimum of 180 credits as required for the bachelor programme by the CTU Academic and Examination Statute.

Section 3

Registration

1. Bachelor and Master Degree student will register for the winter semester prior to its beginning. The prerequisite for passage to summer semester is the fulfilment of conditions given by the CTU Academic and Examination Statute, and upon doing so, student can register for the summer semester, prior to its beginning.
2. Student of higher Bachelor and Master Programmes will register for the following academic year courses upon having fulfilled conditions for passage to the following academic year, given by the CTU Academic and Examination Statute.
3. To be eligible for registration to the following academic year, student will have obtained all the required "zápočets" (i.e. recognition of the current semester coursework and responsibilities, for explanation see footnote below) and passed all examinations in the re-registered (i.e. registered a second time) obligatory courses.
4. Student will enter each course into their course record book (in Czech "index"), in order that it may function as their semesetr/year study plan according to Par.1 and 2, respectively, in agreement with these Policies and Procedures and the CTU Academic and Examination Statute. To register, the following rules are to be observed:
    a. all students of respective branches, specialisations, or years of study will register for compulsory courses (See Sec. 4 and 5)
    b. student will register for optional courses according to their choice, taking into account the rules of the study plan, in particular the sequence of courses, sometimes subject to and required by the field/specialisation study plans. Student will not enter into the course record book courses not concluded by a "zápočet" or examination.
5. Student must not register for the same course a second time if they have concluded it by examination or obtained a "zápočet", as the case may be.
6. The number of years at university will be counted from the first registration for a given programme, including any deferrals.

Section 4

Compulsory Courses

1. If in the course of their programme, a compulsory course is removed from the list, the student is not required to complete it; if, however, the respective course is replaced by another compulsory course (and its title or extent is changed, its contents remaining unaltered), the student is obliged to take the new course (unless they have completed its previous version).

2. When included into the core courses study plan, the new course must be completed only by students stydying no longer than the year of the recommended study plan.
   In the package of bachelor specialisation courses and MCSP, the decision as to which course to take and pass is made by the head of the respective department guarranteeing the corresponding degree.

Section 5

Measuring and Assessing Student´s Academic Attainment

1. The main means for assessing and measuring the student´s academic attainment include: the "zápočet", "klasifikovaný zápočet" , and examinations. The term "samostatný zápočet" is used if the course is not concluded by an examination. Obtaining a "zápočet" is a prerequisite to be admitted to an examination preceded by such a "zápočet".
2. Examinations are usually administered during the respective semester examination period. Adequate number of evenly spread examination dates will be announced by the tutor in order that students may take the examination within the examination period. On agreement with the examiner, students can take examinations outside of the examination period, or even before the end of course (referred to as pre-term examination, in Czech "předtermín").
3. Winter semester examinations and "zápočty" may be administered during the summer semester or summer semester examination period. No examinations and tests for the "zápočet" for the past academic year will be administerd after commencement of the next academic year.
4. To take an examination, student will have registered for it and gained the"zápočet" (if required by the study plan). If student has registered for an examination date and cannot be present for the examination on the chosen date, an apology must be made in advance. A belated apology is accepted for serious reasons of absence (mainly on health), but no later than 2 days after the examination date. The examiner will judge whether the excuse is legitimate.
5. If student has not registered for any examination in the respective course within the examination period and has not made any arrangements as to the examination term with the examiner, the examination is graded as "failure".
6. The succession of courses is stated in the recommended time schedule of the study plan and student will adhere to it for course registrations. Provided the courses run for more semesters or in succession, student cannot obtain a "samostatný zápočet" or take an examination in a course scheduled for a later semester unless they have satisfied the requirements of the previous course. The eligibility requirements are specified by the head of the department responsible for the course.
7. Courses marked A or B are understood to comprise one course, as given by the Academic and Examination Statute of the CTU.

Section 6

Languages

1. As part of the bachelor programme, student will register for and pass examinations in two of the foreign languages offered in the study plan. Foreign students – with the exception of Slovak students – will register for Czech as their second foreign language.

2. Language courses, according to Par.1 are offered in three to five semester cycles, the exception being field Applied Informatics. The time schedule of these courses is part of the study plans.
3. According to Par.2, each semester is a self-contained unit concluded by a "zápočet". If student is admitted to the bachelor programme again (i.e. registers for it a second time), the "zápočet" is not recognized; however, the student does not have to register for the parts of cycle he had already passed successfully. Semesters of the cycle follow the course sequence stated in Section 5, Par.6. Each cycle is concluded by an examination.
4. Language courses can be offered in several groups according to language competence. The level of course to be chosen rests with the student and takes into account their previous langauge training and results achieved. Transfers between courses are possible solely on tutor´s recommendation or student´s application, within two weeks of language course commencement, but not later.
5. Field Applied Informatics follows an extended language programme targeted at professional oral and written communication and includes also a second foreign language course of student´s choice. The time schedule of these courses is part of the study plan of the specialisation. The Bachelor Project is submitted and defended in English. Upon choosing, and supposing they have satisfied criteria defined by the Department of Languages, after 5 semesters of the programme the student can register for a state language examination.
6. Exceptions to compulsory training in more than two foreign languages are judged on individual basis.
7. Details for language training are given in the Rules and Regulations for Langugae Courses issued by the Department of Languages.

Section 7

Courses in Calculus, Linear Algebra, and Mathematics

1. Fundamental courses in mathematics within the bachelor study programmes are offered at three levels of difficulty marked A, B, and C, their course structure being given by the bachelor programme study plans. Calculus plus/A and Linear Algebra plus/A are part of course group A; Calculus /Calculus B and Linear Algebra/Linear Algebra B are part of group B, while level C offers the course Mathematics.
2. Tranfers from course Calculus A to Calculus B, or from course Linear Algebra A to course Linear Algebra B will be possible according to the following rules:
    a. Within the first week of the course commencement; as from the second week, transfers are subject to agreement of both tutors in charge of the courses.
    b. Within the week the "zápočet" is administered on the basis of satisfactory test results in the practical sessions related to the course in question. Student who obtained a "zápočet" at level B is entitled to take a B-level examination only. Student who obtained a "zápočet" at level A has a choice whether to take an examination at level A or B, and will register for the examination according to this choice. If student having a "zápočet" at level A takes an examination at level B (either at the regular date or retake date), then they are not entitled to a retake in the same course at level A.
    c. On recommendation of the examiner after examination at level A. After the first or second retake the examiner can inform student that their attainment satisfies the knowledge required for course B examination only. In such case, on student´s

agreement with the offer, the examiner has the right to enter the grade for course level A instead of the grade for course level B into student´s course record (index).

3. On student´s application and the Dean´s consent, student can register for course A instead of course B.
4. If student attends courses Calculus and Linear Algebra, in the following semester they cannot take the examination at level A unless they have passed all examinations of the previous semester examinations of the course at level A.
5. Like for any other course, also for courses A or B student in allowed to register only two times. Student who has passed a course A examination may not register again for the same course at level B. After the first registration for and examination in course B, student may register for the same course at level A. If in such case student passes the examination at level A, both grades and both "zápočets" count towards measuring their academic attainment.
6. In year 2 of the core course package study plan, student will have to register either for the whole package of A level courses or the whole package of B level courses.
7. Transfers from level A or B to a C level course on student´s application are granted only with permission of the Dean.

Section 8

Bachelor Project, Search, Research Project, and Master Thesis

1. A compulsory part of the Bachelor Degree Programme is the bachelor project defended by student as part of the Final State Examination. A compulsory part of the Master Degree Programme is a Search (in Czech "rešerše"), Research Project, and Master Thesis. Student may not register for them while still registered for the Bachelor Degree Programme. The Research Project is defended before the board nominated by the respective department. Defence of the Master Thesis is part of the Final State Examination. Research Project can be assigned only after student has defended their Bachelor Project and/or obtained a "zápočet" for the Search. Master Thesis will be assigned only after the Research Project defence.
2. Departments will announce topics of bachelor projects, research projects, and master theses no later than end of the previous academic year. Bachelor projects and master theses are assigned to student by the Dean; search and research project are assigned to student by the head of the department.
3. The Bachelor Project, Search, Research Project as well as Master Thesis assignment will include the title (both in Czech and English), outline, recommended literature, the supervisor´s name and affiliation, date of assignment, and date of sumbission.
4. The Bachelor Project, Search, Research Project, and Master Thesis are assigned to student at the beginning of winter and/or summer semester. It is the student's obligation to accept the work assignment within 30 days from the beginning of semester. If student fails to do so, the assignment is postponed until the next semester. Assignment of the Bachelor Project and Master Thesis at an extraordinary term is a prerogative of the Dean, whereas assignment of the Search and Research Project at an extraordinary term is a prerogative of the head of the department.
5. The Bachelor Project and Master Thesis will include items required for bibliography (the title in Czech, author's, name, branch of study, type of work, supervisor, consulting tutor, abstract, and key words; the title in English, author's name, abstract, key words), as well as work

assignment in compliance with the principle of public access to Bachelor Projects and Master Theses according to the given model.

6. Student will submit the Bachelor Project or Master Thesis to the respective department in three hard copies as well as electronically. The language will be Czech or Slovak, the exception being specialisation Applied Information Technology (se Sec.6, Par.5). Exceptions are subject to decision by the head of the department.
7. Bachelor project and master thesis are assessed by their supervisor and at least one reviewer. The reviewers will also suggest a grade.
8. Bachelor projects and master theses are submitted by the date stated in the time schedule of the academic year, i.e. at least four weeks prior to the first day of final state examinations of the given branch or specialisation.
9. If student fails to submit their Bachelor Project or Master Thesis by the required date, validity of its assignment for the future is to be judged on the basis of their application by the student. The judgement is made by the department. The assignment can be extended for no more than one year.
10. Supervisor‘s and reviewers´ reports must be available to student at least 5 days prior to the date of final state examination.
11. Technicalities of submitting the Search and the Research Project and defending the Research Project as well as adminstering the “zápočet“ are within responsibility of the head of the department, as well as defence of the research project, usually held at two dates, namely after the end of the winter and/or summer semester of academic year.
12. Courses Research Project and Master Thesis run for two semesters. Thus, student cannot register for courses Research Project 1 and Research Project 2 in the same semester, and, likewise, for Master Thesis 1 and Master Thesis 2. These courses can be passed provided the requirements contained in the valid work assignment are fullfilled. The student obtains the work assignment in the semester when the first part of the course is subscribed for the first time.

Section 9

Study Visits Abroad

1. As part of their bachelor and master programme student may spend some time on a study visit or bilateral agreement exchange programme abroad. These activities are organized by the International Office at the CTU Rector´s Office , as e.g. the LLP/ERASMUS programme, ATHENS, etc.
2. All study visits of bachelor and master programme students follow the rules and regulations of the CTU and are recorded by the Study Department of the FNSPE CTU in Prague. Part of the rules are also conditions for study visits to be satisfied by students of the FNSPE CTU:
    a. weighted grade average as set by the CTU Academic and Examination Statute, but not below 2.3 (for bachelor student applicant taking into account all courses passed so far, for master student applicant taking into account the average of the completed bachelor course)
    b. English course completed by examination at the FNSPE CTU with grade not below “good“ (= C).
    c. student is eligible for 1 sojourn abroad not exceeding 2 semesters

d. the last semester spent abroad must not be the last semester of student´s standard length study programme (except for the visit given in Par. 2e. below)
e. MCSP student´s intention to work on some part of the master thesis or complete it abroad within their sojourn is to be confirmed by their department´s consent given in writing and including the name of the assigned deputy supervisor of the thesis from the respective host institution, a statement confirming that both parties agreed on details concerning thesis supervison, and a written consent of the supervisor to the procedures agreed

3. In compliance with the CTU‘s rules, arrangements for a study visit abroad comprise:
   a. student´s study plan approved of and recommended by the respective department and sumbitted to the Study Department of the FNSPE CTU prior to the stay
   b. assessment and evaluation of the study visit and programme taken abroad, credit and course transfer approved by the respective department and Study Department of the FNSPE CTU in Prague
   c. fulfilment of general requirements set by the CTU Academic and Examination Statute (i.e. gaining at least 20 credits transferred from the host university per semester).

Section 10

Completion of Study Programme

1. In compliance with the Academic and Examination Statute of the CTU in Prague, student will conclude their studies by having finished their study plan and passed the Final State Examination including defence of their master thesis or bachelor project.
2. To finish the bachelor degree study plan, student must have passed examinations in all compulsory courses of their respective plan (see Sections 4 and 5), having gained at least 180 credits.
3. To finish the master continuation study plan (MCSP), student must have passed examinations in all compulsory courses of the respective study plan (see Sec.4 and 5 and Sec.2, Par.1) and gained at least 120 credits (in the field Radiological Physics 180 credits).

Section 11

Final State examination

1. Student is elegible to take the Final State Examination only if they have completed their study plan, gained the required number of credits, and submitted by the given date their Bachelor Project or Master Thesis.
2. Final state examinations of the bachelor programme may be held at two terms (usually in February or September), which is in accordance with the time schedule of the academic year, or at an extraordinary date subject to the respective department´s request. Each department will announce the subjects set for the final state examination in the bachelor programme by September 30th for the February term, and by January 31st for the September term, or no later than four months prior to an extraordinary examination term.
3. Final state examinations of the master programme are held at two terms (usually in February or September) according to the time schedule of the academic year, or on an extraordinary term subject to the respective department´s request. Each department will announce the subjects set

for the final state examination in the master programme by September 30th for the February term, and by January 31st for the September term, or no later than four months prior to an extraordinary term.

4. Student's application for admission to the final state examination will include the optional subjects chosen. Applications for the February term are accepted by the end of November, and for the September term by the end of May, or no later than two months prior to the extraordinary term of final state examinations. The examination terms are given in the time schedule of the academic year. Applications submitted after the given date will not be considered.
5. The examination follows the Rules of the Final State Examination issued by the Dean.
6. The oral part of the final state examination in the bachelor degree programme will consist of one subject out of the package of field/specialisation courses (with a possible option), and a subject of even more detailed specialisation (with a possible option).
7. The oral part of the final state examination in the master degree programme will consist of two subjects out of the package of field/specialisation courses (with a possible option) and a subject of even more detailed specialisation (with a possible option).
8. In accordance with the Academic and Examination Statute of the CTU in Prague, student must take the final state examination, and, if such is the case, retake it, within one year of the date they have satisfied all the other requirements of the study programme. The date is understood to be the last day of examination period of the last semester student was registerd for courses other than master thesis course. Afterwards, this student still remains enrolled as a student until they have passed the last part of the final state examination; however, this period must not exceed one year.

Section 12

Termination of Studies

1. By virtue of Sec. 56, Par. 1, Letter 11 b) of Law Nr. 111/19898 of Collection of Laws, as ammended, and Sec.20, Par.5, Letter b) of the Academic and Examination Statute of CTU, these documents state the following conditions for terminating studies due to failure to satisfy the requirements and academic obligations following from the study programme and Academic and Examination Statute of the CTU in Prague:
   - failure to fulfill academic responsibilities and gain 15 credits after the first semester on bachelor programme and 20 credits after the first semester on master programme
   - failure to gain "zápočet" after second registration for a compulsory course
   - failure to pass examination on second retake after second registration for a compulsory course
   - failure to pass examination after second registration for a compulsory course by the end of academic year
   - failure to satisfy eligibility conditions to register for the next academic year (semester)
   - failure to pass final state examination within one year of completing studies
   - failure to pass final state examination within the maximum study period
   - failure to pass retaken final state examination
2. Other reasons for terminating studies:

- failure to register for academic year within given period without excuse
- failure to register for courses after period of deferral
- transfer to other faculty
- withdrawal from studies
- expulsion from the CTU

Článek 13
Temporary rules

1. Within the transfer to the newly accredited fields of study the 1st and 2nd years of the bachelor and master degree program is given by the new structure and higher years by the old structure in the academic year 2013-2014.
2. All special cases related to this transfer are handled by the decision of the dean.

doc. Ing.Miroslav Čech CSc.

Dean

Discussed by the Senate of the Faculty of Nuclear Sciences and Physical Engineering of the Czech Technical University in Prague on March 11th 2013 and approved by the Scientific Council of the Faculty of Nuclear Sciences and Physical Engineering of the Czech Technical University in Prague on March 28th 2013.

Grading system at the Czech Technical University in Prague

The following system of assessing and grading academic attainment is in effect:

Non-graded assessment (in Czech "zápočet") expressing recognition of satisfactory fulfilment of coursework, projects, assignments, tests, or research in the respective semester, often judging the student´s potential for registering for the succeeding semester course or for the respective examination

Graded assessment (in Czech „klasifikovaný zápočet"), as above, but a passing grade must be obtained for registration for a successive course

Self-contained non-graded assessment (in Czech "samostatný zápočet"), as above, awarded for attainment if the course is not scheduled to be concluded by an examination

Quality grades for "klasifikovaný zápočet" and examinations:

- passing grades: A (Excellent, výborně), B (Very Good, velmi dobře), C (Good, dobře), D (Satisfactory, uspokojivě), E (Sufficient, dostatečně)
- failing grade: F (Failed, nedostatečně) – this grade is not entered into the student´s course record book, giving them thus a chance to retake the examination or "klasifikovaný zápočet"