ČVUT

ČESKÉ VYSOKÉ
UČENÍ TECHNICKÉ
V PRAZE

Czech Technical University in Prague

Curricula 2023—2024

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).

ANNUAL ACADEMIC CALENDAR 2023 – 2024

ACADEMIC YEAR	Sep 25 2023 – Sep 22 2024

ENROLLMENT

Sep 15 2023	1st year of bachelor's program
Aug 1 – Sep 24 2022	higher years
Sep 18 – 20 2023	preparatory week for new bachelor students

WINTER SEMESTER

Oct 6 2023	Commencement Ceremony for new students
Sep 25 2023 – Dec 22 2023	scheduled classes (13 weeks)
Dec 25 2023 – Jan 7 2024	winter holidays
Jan 8 2024 – Feb 11 2024	examination period
until Nov 30 2023	applications for February final examinations
until Jan 8 2024	theses submission for February final examinations
until Jan 19 2023	closure of study results for February final examinations
Jan 29 – Feb 9 2023	February final examinations

SUMMER SEMESTER

Jan 15 – Feb 9 2024	enrollment to summer semester
Feb 12 – May 12 2024	scheduled classes (13 weeks)
May 13 – 19 2024	additional classes
May 20 – Jun 30 2024	examination period
Jul 1 – Aug 31 2024	summer holidays
Sep 2 – Sep 22 2024	extended examination period
until Mar 31 2024	applications for June final examinations
until May 10 2024	theses submission for June final examinations
until May 24 2024	closure of study results for June final examinations
until May 31 2024	applications for September final examinations
until Aug 5 2024	theses submission for September final examinations
until Aug 16 2024	closure of study results for September final examinations
June 3 – June 14 2024	June final examinations
Aug 26 – Sep 6 2024	September final examinations
May 14 2024	Rector's Day

Approved by the management of the FNSPE CTU in Prague on March 8, 2023.

LIST OF DEPARTMENTS

DEPARTMENT	ABBREVIATION	CODE
Department of Mathematics	KM	01
Department of Physics	KF	02
Department of Human Sciences and Languages	KJ	04
Department of Solid State Engineering	KIPL	11
Department of Physical Electronics	KFE	12
Department of Materials	KMAT	14
Department of Nuclear Chemistry	KJCH	15
Department of Dosimetry and Application of Ionising Radiation	KDAIZ	16
Department of Nuclear Reactors	KJR	17
Department of Software Engineering	KSI	18

DEGREE PROGRAM STRUCTURE

ACCREDITED BACHELOR'S DEGREE PROGRAMS

PROGRAM	CODE	ABBREVIATION	TIME EXTENT
Mathematical Engineering	B0541A170022	P_ MIB	3
Applied Mathematical Stochastic Methods	B0541A170024	P_ AMSMB	3
Nuclear and Particle Physics	B0533A110015	P_JCF	3
Physical Engineering	B0533A110016	P_FIB	3
Nuclear Chemistry	B0531A130028	P_JCHB	3
Decommissioning of Nuclear Facilities	B0588A110002	P_VJZPB	3
Quantum Technologies	B0533A110024	P_QTB	3
Applied Analysis and Algebra	B0541A170025	P_AAAB	3

ACCREDITED MASTER'S DEGREE PROGRAMS

program	code	abbreviation	time extent
Mathematical Engineering	N0541A170028	P_MIN	2
Mathematical Informatics	N0541A170031	P_MINFN	2
Mathematical Physics	N0533A110032	P_MFN	2
Applied Mathematical Stochastic Methods	N0541A170029	P_AMSMN	2
Nuclear Engineering	N0533A110041	P_JIN	2
Nuclear and Particle Physics	N0533A110030	P_JCFN	2
Physical Electronics	N0533A110043	P_FEN	2
Solid State Engineering	N0533A110038	P_IPLN	2
Physical Engineering of Materials	N0533A110036	P_FIMN	2
Plasma Physics and Thermonuclear Fusion	N0533A110034	P_FPTFN	2
Nuclear Chemistry	N0531A130039	P_JCH	2
Decommissioning of Nuclear Facilities	N0788A110002	P_VJZPN	2
Quantum Technologies	N0533A110047	P_QTN	2
Applied Analysis and Algebra	N0541A170035	P_AAAN	2

MASTER'S DEGREE PROGRAMS

open in the academic year 2023 - 2024

NUCLEAR AND PARTICLE PHYSICS

Area of education: Physics 100 %

Program coordinator: doc. Dr. rer. nat. Mgr. Jaroslav Bielčík

Specializations of the study program:

- ***The program has no specialization***

Goals and Outcomes:

The master´s degree course is oriented towards nuclear and elementary particle physics, these are the fields of study that bring fundamental knowledge about the structure of matter and basic interactions that are happening in the microworld. Many discoveries and knowledge from physics are already in our daily life and are used in many fields that are not just physics. The study plan that this programme offers is mainly based on advanced modules, such as quantum field theory, particle physics and system of modern detectors together with data analysis and data processing. These modules were chosen due to the needs of modern research in the field of nuclear and elementary physics, students then may further specialize by choosing one of the compulsory elective courses. Students can choose to do theoretical or experimental or accelerators.

The fundamentals of the specialized study are the following common theoretical modules. Such as Quantum field theory 1 and 2, Introduction to Theory of Electroweak Interactions and Introduction to Quantum Chromodynamics. These subjects are then supplemented by subjects of profiling basis such as Modern Detectors, Detector Systems and Data Acquisition together with the Statistical Data Analysis 1 and 2, which will acquaint students with modern technology and the industry. Students will attend a series of seminars 1-4 where they will be presenting their research together with talks about the latest news in physics. Students can specialize by choosing one of the three groups of compulsory elective courses. In the experimentally focused group E they complete the subjects Extreme states of matter and Physics of Ultrarelativistic Nuclear Collisions, in the theoretically focused group T they complete the General Theory of Relativity and in the instrumentally focused group I where they complete Accelerators 1 and 2.

The program emphasizes on modern methods of obtaining experimental data and their processing using computer technology, machine learning, and physical interpretation of experimental results, which is then formulated into theoretical models and possible practical applications for acquired data. Teaching is represented by the form of choice of optional subjects, work in specialized laboratories. There are preferred individual forms of teachings under a supervisor together with seminars. Students are involved in ongoing researches projects where they can contribute to their problem-solving skills and are slowly being prepared for modern collective forms of scientific work in an international group. Teaching takes place in close cooperation with non-faculty workplaces such as (Academy of Sciences of the Czech Republic, CERN Geneva, Brookhaven National Laboratory, GSI Darmstadt, etc.). It is, therefore, a comprehensive study program with interdisciplinary content, the aim of which is to prepare graduates for work in academia and industry.

Graduate Profile:

Knowledge: Graduate will gain the most comprehensive possible knowledge of modern nuclear and particle physics, which will enable him to creatively participate in solving new interdisciplinary scientific and technical problems. The acquired knowledge covers all areas of nuclear, particle and quantum physics, detection methods, ionizing radiation detectors and accelerators. The graduate may directly continue in a follow-up doctoral study in the same or a related field.

Skills: Graduate will gain skills in the application of methods of modern physics in solving problems. The acquired skills will consist of preparation and implementation of experiments

and subsequent processing of measurement results which then can be interpreted, this includes a comprehensive analysis of statistical and systematic errors. The graduate will also gain experience working in large international collaborations and the ability to present, communicate and defend the results obtained and, last but not least, will gain skills to participate in the preparation and construction of accelerators.

Competence: Graduates will find employment in industry, basic and applied research and the private sector thanks to the analytical way of work, the systematic approach given by the acquired knowledge and the ability to work with modern computer technology and machine learning methods. They can work in nuclear research institutions, healthcare or the automotive industry. They acquire the qualification of a physicist - researcher with a wide range of possible applications in research (basic, applied, strategic) and in development for technical practice. They will be prepared to solve physical problems using modern experimental techniques, process large-volume data and operate accelerators.

State final examination:

- defence of the diploma project
- oral examination in the general subject
  Particle Physics
- oral examination in the profile subject
  Experimental Methods
- oral examination in the profile subject with optional choice:
  General Theory of Relativity
  Heavy Ion Physics
  Accelerators

PHYSICAL ELECTRONICS

Area of education: Physics 100 %

Program coordinator: prof. Dr. Ing. Ivan Richter, Dr.

Specializations of the study program:

- ***Laser Physics and Technology***
- ***Photonics***
- ***Computational Physics***

Goals and Outcomes:

The master´s degree multidisciplinary program of *Physical Electronics* is oriented towards classical and modern areas of physics, mathematics, and informatics. Specifically, these includes the fields that bring fundamental knowledge about, following the three specializations, laser physics and technique, photonics, and computer physics. The program leads graduates to applications of physical methods in natural-science and engineering practice, often with the help of modern computer technique. The program enables deeper focus in one of the following three specializations of modern applied physics. In the specialization *Laser physics and technology*, students are prepared in the areas and technical applications of coherent laser and charged particle beams and plasma physics. In the specialization *Photonics*, students are prepared in the modern areas of optics, photonics, and photonic nanostructures, including theoretical design, analysis, realization, characterization, and applications. In the specialization *Computational Physics*, students are equally acquired with knowledge of physical backgrounds of high-tech state-of-the-art technologies and modern informatics and computer systems. Deeper interconnection of modern physics, mathematics, and informatics, enables the program graduates to further increase their qualification to higher study degrees, and thus acting in the physical, natural-science, and technical practice, or application in science, research, and technical practice. Many discoveries and knowledge from these areas of applied physics are already applied in our daily life and are used in many surrounding fields. The study plans this program are based on advanced modules, either general or specific to each specialization, such as classical electrodynamic, physical optics, quantum electronics, quantum optics, nonlinear and statistical optics, laser technique, etc. These modules were chosen due to the needs of modern research in the fields of laser physics and technique, photonics, and computer physics.

The program emphasizes on modern methods of obtaining both theoretical and experimental data and their processing using current computer technology, and physical interpretation of experimental results, which is then formulated into theoretical models and possible practical applications. Mandatory courses in each specialization are amended by the form of choice of optional subjects, and work in specialized practical laboratories. Students are involved in ongoing researches projects where they can contribute to their problem-solving skills and are slowly being prepared for modern forms of scientific work. Teaching takes place in close cooperation with non-faculty workplaces such as the Academy of Sciences of the Czech Republic. It is, therefore, a comprehensive study program with interdisciplinary content, the aim of which is to prepare graduates for work in academia and industry.

Graduate Profile:

Knowledge: A graduate will gain the most comprehensive knowledge of fundamental physical, mathematical, and informatics fields which are, in dependence on the particular specialization, deepened in the areas of most important experimental methods and theoretical models of current laser physics and technique, photonics, and computer physics. This will enable the graduates to creatively participate in solving new interdisciplinary scientific and technical problems in the related areas. The graduates may directly continue in

a follow-up doctoral study in the same or a related field (Physical Engineering, Quantum Technologies, and others).

Skills: A graduate will gain skills in the application of methods of modern physics and engineering in solving realistic problems, with the help of modern computer technique. The acquired skills, using the methods and techniques of mathematics and physics, will enable solving realistic research and engineering problems in the areas of laser physics and technique, photonics, and computer physics. The graduate will also gain experience and skills to follow new trends in given areas, and quickly orient in multidisciplinary problems, analyze them and synthesize the results, together with the ability to present, communicate, and defend the results obtained.

Competence: Master graduates will find employment in industry, basic and applied research, and the private sector thanks to the analytical way of work, the systematic approach given by the acquired knowledge and the ability to work with modern computer technology and machine learning methods. They will be prepared to solve physical problems using modern theoretical and experimental techniques. They acquire the qualification of a physicist - researcher with a wide range of possible applications in research (basic, applied, strategic) and in development for technical practice. They can either continue in their studies in doctoral programs, or work in research laboratories, in the development, and test and / or product certificate centers, in metrology, and in various applications of laser and photonic techniques and technologies.

State final examination:

- defence of the diploma project
- oral examination in the general subject
  Electrodynamics
- oral examination in the profile subject with optional choice:
  Optics and Quantum Electronics
  Computational Physics
- oral examination in the profile subject with optional choice:
  Laser Physics and Technology
  Photonics
  Numerical Methods in Applied Physics
  Physics of Laser Plasma and Inertial Fusion

MATHEMATICAL PHYSICS

Area of education: Physics 100 %

Program coordinator: doc. Ing. Libor Šnobl, Ph.D.

Specializations of the study program:

- ***The program has no specialization***

Goals and Outcomes:

The study of Mathematical Physics is focused on advanced areas of modern mathematical physics and applied mathematics. It leads its graduates to apply the acquired knowledge in the development of theoretical physics, with a particular focus on mathematically rigorous procedures and methods, as well as in theoretical analysis and description of physical models for more experimentally focused physics disciplines, in scientific and engineering practice, also involving modern computer technology.

The subjects of the study are focused on deepening the knowledge of the needed fields of physics and mathematics and provide sufficient overview of the current state of theoretical and mathematical physics. The programme also involves compulsory student projects designed to work on an individually assigned research topic. These projects allow each student a better orientation in the field of his specialization and usually lead to original research results publishable in international professional journals.

Students gain deeper insight especially in quantum mechanics and field theory, classical and quantum

theories of gravity, statistical physics, quantum information theory, and related modern fields of mathematics, e.g. in differential geometry and topology, theory of Lie groups, algebras and their representations, functional analysis and in the spectral theory of operators.

The programme is designed for particularly gifted students, with great motivation to study and with an inclination towards academic career.

Graduate Profile:

Knowledge: The graduates will gain a broad knowledge of the above mentioned advanced mathematical and physical disciplines, which depending on their particular specialization can be deepened in the fields of particle physics, applied mathematics or scientific and technical calculations.

Skills: Application of methods and procedures from various areas of mathematics and physics towards the solution of theoretical and application-oriented scientific, research and engineering problems. In addition to the special knowledge gained from the study, they also include typical sfot skills of students of the Mathematical Physics programme: adaptability, quick orientation in new interdisciplinary issues, analysis of problems and their computer processing, synthesis of results and good written expression.

Competence: Graduates will find employment in the academic sphere, applied research and industry thanks to their analytic and systematic approach to problems and their ability to work with modern computing technology. The primary focus of the study programme is to prepare its graduates to work at universities, in

institutes of the Academy of Sciences and other research organizations. However, given the skills acquired, in particular analytical way of thinking, it is possible to successfully apply them in research, development and analytical departments of companies across the economy, including banks, insurance companies and

consulting firms.

State final examination:

- defence of the diploma project
- oral examination in the general subject

  Quantum Physics
- oral examination in the profile subject

  Advanced Geometric Methods in Physics
- oral examination in the profile subject with optional choice:

  Quantum Field Theory

  Lie Algebras, Lie Groups and Their Applications

  Statistical Physics

SOLID STATE ENGINEERING

Area of education: Physics 100 %

Program coordinator: doc. Ing. Ladislav Kalvoda, CSc.

Specializations of the study program:

- ***The program has no specialization***

Goals and Outcomes:

Study in *Solid State Enginering* is oriented towards advanced parts of solid state physics and their practical applications in engineering and scientific practice. The aim of the study is to pass a graduate knowledge of the physical nature, theoretical description and interpretation of a variety of special phenomena and properties resulting from the diversity of the internal order of solids, explain and demonstrate the main methods of their experimental studies and computer modeling and give an overview of current and potential applications, which these phenomena and properties use, including interdisciplinary context. The study includes specialized laboratory courses and separate student projects for work on an individually assigned research topic. These projects allow students to asquire a deeper understanding the scientific nature of the given problem and to exercise the already acquired theoretical knowledge, and generally lead to the original results publishable in scientific journals or applicable in the development of new engineering technologies.

Graduate Profile:

Knowledge: The graduate will asquire a broad knowledge in physics, theory and properties of solids, become familiar with theoretical basics and practical implementation of the main experimental methods applied in the study of solids and the basics of computer modeling of their structure and properties, and get sufficient relevant orientation in technical multi-discilinary applications of solid state structures.

Skills: The graduate is able to understand and analyze the physical and technical problems in the field of *Solid State Engineering*, formulate and solve new problems, and the achieved solutions transform to practically applicable results instrumental in solving real engineering, research and scientific problems. In addition to special knowledge acquired by studies, the typical skills of *Solid State Engineering* program graduates involve adaptability, fast orientation in new interdisciplinary issues, analysis of problems and their computer processing, synthesis of final knowledge and good written expression. The acquired features also include personal responsibility for the work done and decisions taken.

Competence: Graduates will find very good applications in industry, research and private sphere due to their working skills combining analytical and synthetic methods, a systematic approach to problems' solution based on the acquired knowledge and the ability to work with modern computing and experimental techniques and technologies. Engineer - Graduated in the Program – finds, due to the acquired widespread knowledge, good application in all academic and industrial workplaces dealing with research and development in one of the fields that use solid state physics, such as microelectronics, surface physics, thin films and low-dimensional systems, sensors, imaging techniques, photovoltaics, low temperature and superconductivity physics, applied photonics and telecommunications, and further in specialized analytical and development laboratories that utilize spectroscopic techniques, X-ray and neutron diffraction, electrical and magnetic measurements or advanced procedures of computer simulations and properties of solids / condensed matter. Due to the analytical and mathematical knowledge, the graduates also apply in the field of management and finance and succeed in leading functions.

State final examination:

- defence of the diploma project
- oral examination in the general subject
  Theory of Solids
- oral examination in the profile subject
  Physics of Solids
- oral examination in the profile subject with optional choice:
  Properties of Solids

QUANTUM TECHNOLOGIES

Area of education: Physics 100 %

Program coordinator: doc. Ing. Martin Štefaňák, PhD.

Specializations of the study program:

- ***The program has no specialization***

Goals and Outcomes:

Continuation master's study programme Quantum Technologies is a multidisciplinary study programme aimed at the education of the next generation of experts in the fields of quantum information, quantum communication, quantum optics, lasers physics and technology, condensed matter physics and nanomaterials, who will engage in research and development of modern technologies. The main part of the study is focused on advanced topics of quantum physics and its applications in solid state, light-matter interactions and quantum information. Studies foster independent analytical thinking skills of students and their ability to employ learned methods in various branches of physics and technology. Great emphasis is placed on preparation of students to conduct independent research. Part of the study is the individual student's research project culminating in the master's thesis. Results obtained in the master's thesis will be targeted for publication in a scientific journal.

Graduate Profile:

Knowledge: Graduates acquire a broad knowledge of modern parts of physics, especially of quantum theory, solid state physics and laser theory. Depending on the scientific focus of the graduate the education is further intensified in the fields of quantum optics, quantum information, lasers or nanomaterials. Graduates can proceed with their studies in the follow-up doctoral study programme in the same or related field.

Skills: Application of methods and techniques from various fields of mathematics and physics to solve both theoretical and real-world engineering, research and scientific problems in the areas of quantum theory, classical and quantum optics, quantum information, condensed matter, physics and technology of lasers. Employment of modern computational and laboratory equipment. Ability to pursue modern trends in the respective field of the graduate. Rapid orientation in multidisciplinary issues, analysis of problems and synthesis of results. Responsibility at work and the ability to present the obtained results in a comprehensible way.

Competence: Graduates find application in higher education, research and industry thanks to the acquired knowledge, analytical skills, systematic approach and the ability to work with modern computational technologies. Graduates can work at universities, academic institutes and research and development centers in industry. Competence of graduates lies in the development of modern technologies e.g. in nanomaterials, metrology, informatics or secure communication. Apart from professional expertise the graduates have the ability to succeed in management.

State final examination:

- defence of the diploma project
- oral examination in the general subject
  Methods of Quantum Technologies
- oral examination in two profile subjects with optional choice:
  - Quantum Field Theory
  - Quantum Optics
  - Theory of Solid States

- Quantum Generators of Optical Radiation
- Quantum Information and Communication

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

ACADEMIC YEAR 2023-2024

The Policies and Procedures of the FNSPE of the CTU in Prague complement and specify the rules and regulations introduced by the Higher Education Act and the Academic and Examination Statute of the CTU in Prague. This document is binding on all academics and students of FNSPE.

The term **Study Programme** (studijní program in Czech) - as used in this text - refers to the complete programme of academic training duly accredited by FNSPE. The Study Programmes offered by FNSPE are structured and are comprised of Bachelor and Continuation Master Studies. Compliant with the valid accreditation, some Study Programmes are subdivided into **Specializations** (specializace in Czech). If the programme in question does not offer any Specializations, the term **Field of Study** (studijní směr in Czech) refers to the Study Programme. In other cases, it refers to every single Specialization of the Study Programme.

Curriculum (studijní plán in Czech) refers to the set of academic responsibilities to be assumed by students of a specific Field of Study as set by the present White Book of Study Programmes. **Individual Curriculum** (individuální studijní plán in Czech) is a term used to express a unique full-time curriculum which suits a single student, thus, e. g, typically extending a standard curriculum to a longer period of time or adding to it several required prerequisites student did not cope with in the past period of study. **Personal Curriculum** (osobní studijní plán in Czech) then includes the set of personal academic responsibilities (courses to be taken) of a particular student.

Curricula of every single Field of Study of the Bachelor and Continuation Master Programmes, compliant with the CTU Academic and Examination Statute, Sec.4, list both the compulsory and core-elective courses as well as optional courses recommended for the respective Field of Study.

Section 1

Bachelor Programme (BP)

1. Curricula in the Bachelor´s Degree Programme contain compulsory, optional, and core-elective bachelor courses.
2. In the Bachelor Programme, it is not permitted to register for courses of the Continuation Master Programme, the exception being given by Sec. 2, Par. 4 a.

Section 2

Continuation Master Programme (MCP)

1. Curricula in the Field of Study of the Continuation Master´s Degree Programme (CMP) list compulsory, core-elective, and optional master courses. In the Continuation Master Programme, it is not permitted to enrol into courses of the Bachelor´s Degree Programme.
2. To be eligible for the CMP, (in terms of conditions set by law and rules of the admission procedure), all applicants are required to have completed a Bachelor Programme in a related or identical field of study as well as to have successfully passed the entrance examination. However, student may be exempt from the examination on the Dean´s recommendation.
3. If necessary, for the first two years, student on the CMP will have an individual curriculum, so as to attain the competences required for the completed Bachelor´s Degree Course and develop them. The individual curriculum follows from consultations with the respective programme guarantor, and its final version will be available before start of first semester classes.
4. For transfer from the Bachelor Programme to the respective CMP, the following rules are imposed:
   a. In the Bachelor´s Degree Programme, it is possible to register for courses in the recommended 1st year CMP programme provided the credits obtained do not exceed the total number of 30. Such credits must be grated beyond the limit of 180 credits obtained in the Bachelor´s Degree Course.
   b. Provided student has graduated from a Bachelor Course at FNSP and transfers to the CMP, on application, courses listed in the recommended 1st year CMP curriculum can be counted for up to 30 credits if obtained beyond the mandatory minimum of 180 credits as set for the Bachelor Programme by the CTU Academic and Examination Statute.
   c. The CMP will not recognize courses taken within the Bachelor Programme beyond those recommended by the programme of a given field.

Section 3

Registration

1. Bachelor and Continuation 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. Students on higher courses of Bachelor and Continuation Master Programmes will register for the following academic year courses prior to their beginning on having fulfilled passage requirements for 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 end-of-unit assessments (“zápočet” in Czech, i.e. recognition of the current semester coursework responsibilities) and passed all examinations in the re-registered (i.e. registered for a second time) obligatory courses.

4. Student will register for each course in the electronic information system of the CTU in order that they may function as their personal semester/year study curriculum according to Par.1 and 2, respectively, in agreement with these procedures and the CTU Academic and Examination Statute. To register, the following rules are to be observed:
   a. All students of respective fields of study will register for compulsory courses (see Sec. 4 and 5).
   b. Student will register for optional and core-elective courses according to their choice, taking into account the rules of the curriculum, in particular the sequence of courses, sometimes subject to and required by the curriculum of the field of study.
   c. Bachelor students of a given study programme may register for optional courses of their programme (recommended optional courses or any other courses of other bachelor programmes offered at FNSPE). Upon this, these courses are regarded as an optional part of student´s respective curriculum.
   d. Master students of a given continuation study programme may register for optional courses in the same programme (recommended optional courses) or any courses in the continuation master study programmes of FNSPE. Upon this, these courses are regarded as an optional part of student´s respective field of study curriculum.
   e. Registration to an optional course offered by another institution of higher education is possible on student´s application to the Department of Student Affairs. If successful, student can list the course as optional in their curriculum.
5. Student must not re-register for the same course if they have passed the examination or obtained the "zápočet", as the case may be.
6. If student has discontinued their study in the immediately preceding semester, requirements to be fulfilled are postponed towards the next registration.
7. Details on registration are gradually specified by notices of the Department of Student Affairs.

Section 4

Compulsory Courses under Changes in Curricula

1. If in the course of their programme, a compulsory course is removed from the list, 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), student is obliged to take the new course (unless they have completed its previous version).
2. When included into student´s curriculum, the new course must be completed only by students studying no longer than the year of the recommended curriculum to which the new course is transferred. If required, the decision to take the course is made by the head of the respective department guaranteeing the corresponding field of study.

Section 5

Measuring and Assessing Student´s Academic Attainment

1. The main instruments for assessing and measuring student´s academic attainment include the end-of-unit-assessment ("zápočet"), graded assessment ("klasifikovaný zápočet"), and examinations. The term "end-of-unit assessment only" ("samostatný

zápočet“) is used if the course is not concluded by an examination. Obtaining a “zápočet“ is a prerequisite for being admitted to take an examination preceded by such “zápočet“.

2. Examinations are usually administered during the respective semester examination period. An 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.
3. End-of-unit assessments and examinations may not be administered before student has completed the respective course. If registered for the course a second time, student may take the end-of-unit assessment or examination any time in the course of the academic year provided they have fulfilled all academic obligations to finish the course and obtained the tutor´s agreement.
4. Winter semester examinations and end-of-unit assessments may be administered during the summer semester or summer semester examination period. No examinations and tests for the end-of-unit assessment for the past academic year will be administered after commencement of the next academic year.
5. To take an examination, student will have registered for it and gained the end-of-term assessment (if required by the curriculum). If student has registered for an examination date and cannot be present for the examination on the chosen date, an advance apology must be made. A belated apology is accepted for serious reasons of absence (mainly on health), but no later than 5 days after the examination date they have been registered for. The examiner will judge the legitimacy of the apology. If student failed to be present for the examination and no apology was made in advance or was not accepted, the examination term expires and the examination is graded as “failure”.
6. If student has not registered for any examination in the respective course within the examination period and has not made any arrangements with the examiner as to the examination term, the examination is graded as “failure.”
7. The tutor´s/examiner´s obligation is to enter immediately the result/grade into the CTU electronic information system, within 5 days at the latest, and the department´s non-electronic registers independent of the CTU´s electronic system. If student requests recognition of a course on the list of some other degree course or in cases given by notices concerning student on Bachelor or Continuation Master Courses, such entries may be the responsibility of the Study Office.
8. The succession of courses is stated in the recommended time schedule of the programme and student will adhere to it for course registrations. Provided the courses run for more semesters or in succession, student cannot obtain an end-of-unit assessment only (“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.
9. Courses marked A or B are understood to comprise one course, as given by the Academic and Examination Statute of 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 curriculum. Foreign students – with the exception

of Slovak students and those who passed an examination in Czech as part of their school-leaving examination - 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 students of Applied Information Technology. The time schedule of these courses is part of the curriculum.
3. According to Par. 2, each semester is a self-contained unit concluded by a "zápočet". If student is re-admitted to the Bachelor Course (i.e. registers for it a second time), they do not have to re-register for the parts of cycle they had already passed. Semesters of the cycle follow the course sequence stated in Section 5, Par.8. Each semester of the cycle is concluded by a "zápočet" only if student has obtained a "zápočet" for the previous semester course. The language programme cycle is concluded by an examination.
4. Language courses can be offered in several groups according to student´s language competence. The level of course to be chosen rests with the student and takes into account their previous language 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. Applied Information Technology programme 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 this study programme curriculum. The bachelor project in this study programme is submitted and defended in English. Supposing they have satisfied criteria defined by the Department of Humanities and Languages, and having completed 5 semesters of the Applied Informatics programme, student can register for a State Language Examination.
6. Exceptions to compulsory training in more than two foreign languages are judged by the Department of Humanities and Languages on individual basis. Student can choose and register for a third language only if they had concluded the cycle of two languages as stated in Par.1 of this Section.
7. Details for language training are given in the binding regulations for language courses issued by the Department of Humanities and Languages.

Section 7

Bachelor Project, Research Project, and Master Thesis

1. A compulsory part of the Bachelor´s Degree Course is the Bachelor Project defended by student as part of the State Final Examination. A compulsory part of the Continuation Master Course is a Research Project and Master Thesis. Student may not register for them while still registered for the Bachelor Course. The Research Project is defended before the board nominated by the respective department. Defence of the Master Thesis is part of the State Final Examination. The Research Project can be assigned only after student has defended their Bachelor Project. The degree thesis can be assigned only after student has completed and successfully defended Research Project 2.
2. The administrators (guarantors) will announce the 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 students by the Dean; Research Projects are assigned to students by the Head of Department.

3. The Bachelor Project, Research Project, as well as Master Thesis will be written in Czech, Slovak, or English.
4. The Bachelor Project, Research Project as well as Master Thesis can be assigned in Czech or in English. The Czech version of these assignments will include the title (both in Czech and English). The outline, recommended literature, supervisor´s name and affiliation, date of assignment, and date of submission will be written in Czech. If the Bachelor Project, Research Project, or Master Thesis is assigned in English, a Czech version of the assignment must be also prepared. The topic of the assignment must be in agreement with the domain of education to which the study programme belongs. The assignment is valid for two years.
5. The Bachelor Project, Research Project, and Master Thesis are assigned to student at the beginning of the winter and/or summer semester. It is the student‘s obligation to receive the work assignment within 40 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 research project at an extraordinary term is a prerogative of the Head of Department.
6. The Bachelor Project and Master Thesis will include items required for bibliography (in Czech: the title, author’s name, study programme (or its specialization), type of work, supervisor, consulting tutor (if assigned), abstract, and key words; in English: the title, 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 standard.
7. Student will submit the Bachelor Project or Master Thesis to the respective department electronically via the KOS component. If a proposal is presented to postpone public access to the Bachelor Project or Master Thesis (pursuant to Sec. 47b, par. 4 of Act N.111 1998 Coll. on Higher Education as altered and amended), student will also submit one bound hard copy.
8. If justified, on the supervisor´s suggestion public access to the project or thesis may be postponed for 1, 2, or 3 years. An application to do so justifying postponement (and signed by the Head of Department) must be submitted along with the Bachelor Project and Master Thesis, but no later than 30 days prior to submission.
9. The Bachelor Project and Master Thesis are evaluated by the supervisor and reviewed by at least one reviewer. In their reviews they also suggest the final grade.
10. Bachelor Projects and Master Theses are submitted by the date given in the time schedule of the academic year, taking also into account the dates of the State Final Examination, i.e. at least three weeks prior to the first day of the State Final Examination of the given field of study or specialization.
11. If student fails to submit the Bachelor Project or the Master Thesis at the time agreed, the assignment can still be used for the time period it is valid. If, however, student fails to observe the scheduled deadline and the Bachelor Project or Master Thesis is submitted after the assignment validity has come to an end, a new assignment has to be given.

12. Supervisor´s and reviewer´s reports must be made available to student at least 5 working days prior to the date of the State Final Examination.
13. Academic degree status of the person supervising the Bachelor Project or Master Thesis is expected to be at least a level above the level of the degree programme to be achieved by student. Exceptions are subject to decision of the Scientific Board of FNSPE.
14. In case the supervisor is a professional not affiliated with the university, a requisite for nominating a consulting co-supervisor is employment relationship with CTU.
15. Reviewer of the Master Thesis may not be nominated from the same place of work (e.g. the department, division) as the supervisor, which, however, does not refer to the Bachelor Project. An exception may be made on application submitted to the Department of Student Affairs and assessed by the Dean.
16. The peer-review must include

    - Type of review (written by the supervisor / the reviewer).
    - Title of the reviewed work.
    - Author´s name, surname and titles/degrees, as applicable.
    - Final grade, written in full and in letter form.
    - Details on the reviewer´s place of work.
    - Review date.

17. Technicalities of submitting the Research Project and defending it, as well as conditions for administering the "zápočet" are within responsibility of the Head of Department and so is the defence of the Research Project, usually held at two ordinary dates - namely after end of the winter/summer semester courses of the academic year. In case student fails to defend their Research Project at an ordinary date, they can defend it (within the same registration) at an extraordinary date during the prolonged examination period of the academic year.

18. Bachelor Project ~~1~~, Research Project ~~1~~ and Master Thesis ~~1~~ courses run for two semesters. Thus, student cannot register for Bachelor Project 1 and Bachelor Project 2, Research Project 1 and Research Project 2 courses in the same semester, and, likewise, for Master Thesis 1 and Master Thesis 2 courses. These courses can be passed provided student meets the requirements given in the valid work assignment. The students obtains the assignment in the semester first registering for the first part of the course. Student may not register for the Master Thesis 1 course before the semester following their successful defence of Research project 2.

Section 8

Study Visits Abroad

1. As part of their Bachelor and Continuation Master Programme, student may spend some time on a study visit or bilateral agreement exchange programme abroad. These activities, as e.g. ERASMUS+ programme or ATHENS, are organized by the International Office at the CTU Rector´s Office.

2. All study visits of Bachelor and Continuation Master Programme students follow the rules and regulations of CTU and are recorded by the Department of Student Affairs of FNSPE CTU in Prague. These rules also include the following conditions for study visits of CTU students:
    a. student on any type of degree course is eligible for 2 long-term visits abroad not exceeding 2 semesters
    b. under extraordinary conditions the visit may be extended on application addressed to the Department of Student Affairs
    c. MCP student´s intention to work on some part of the Master Thesis or complete it abroad within their visit is to be confirmed by the consent given in writing by the respective Head of Department and also including the name of the assigned deputy supervisor of the thesis from the respective host institution. The statement confirms that both parties agreed on details concerning thesis supervision, and the supervisor gave a written consent to the procedures agreed. The same refers to a research project.
    d. student staying abroad can be signed in for the semester without being registered for a specific course; in well-founded cases they may apply for exception on a standard application addressed to the Department of Student Affairs.

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

Section 9

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 curriculum and passed the State Final Examination including defence of the Master Thesis or Bachelor Project.
2. To complete the Bachelor Degree Programme curriculum, student must have passed examinations in all compulsory courses of their respective curriculum (see Sections 4 and 5), having gained at least 180 credits.
3. To complete the Continuation Master Programme (MCP), student must have passed examinations in all compulsory and core-elective courses as stated in the respective curriculum (see Sec. 4 and 5 with respect to Sec. 2, Par. 1) and gained at least 120 credits.

Section 10

State Final Examination

1. Student is eligible to take the State Final Examination only if they have completed their curriculum, gained the required number of credits, and submitted by the given date their Bachelor Project or Master Thesis.
2. State Final Examinations of the Bachelor´s Degree Programme may be held at two terms: usually in September or in February, which is in accordance with the time schedule of the Academic Year or at an extraordinary date subject to the respective department´s request.
3. State Final Examinations of the Continuation Master Programme are held at two terms (usually in June or February) according to the time schedule of the Academic Year, or on an extraordinary term subject to the respective department´s request.
4. Student's application for admission to the State Final Examination will include the optional subjects chosen for the examination. Applications for the February term are accepted by the end of November of the previous calendar year, for June term by the end of March, and for the September term by the end of May, or no later than two months prior to the extraordinary term of State Final 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. If student did not take the State Final Examination in the Academic Year they had submitted the Bachelor Project or Master Thesis, the respective review reports are no longer valid.
6. The examination follows the Rules of Procedure of the State Final Examination issued by the Dean.
7. The oral part of the State Final Examination in the Bachelor Programme or Continuation Master Programme consists of a core subject or subjects out of the package of specialization courses (with a possible option) and a subject or subjects of more detailed specialization (with a possible option). The number of subjects in a respective category (common core, specialization), as well as option are defined according to the definition of the State Final Examination included in the accreditation materials of the respective field of study.
8. In accordance with the CTU Academic and Examination Statute, student must take the State Final Examination, and, if such is the case, retake it, within one year and a half 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 registered for courses of their personal curriculum. Afterwards, this student still remains enrolled as a student until they have passed the last part of the State Final Examination; however, this period must not exceed one and a half year.

Section 11

Termination of Studies

1. By virtue of Sec. 56, Par. 1, Letter b) of Act No. 111/19898 of Coll., as amended, and Sec. 34, Par. 7, 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 CTU:
   - failure to fulfil academic responsibilities and gain 15 credits after the first semester on the Bachelor Programme and 20 credits after the first semester on the Master Programme
   - failure to gain "zápočet" after second registration for a compulsory course
   - failure to pass examination on last retake after second registration for a compulsory course
   - failure to pass examination by the end of Academic Year after second registration for a compulsory course
   - failure to satisfy eligibility conditions to register for the next Academic Year (semester)
   - failure to pass the State Final Examination within one and a half year of completing studies
   - failure to pass the State Final Examination within the maximum study period
   - failure to pass the retaken State Final Examination
2. Other reasons for terminating studies:
   - failure to register for academic year within a given period without accepted apology or failure to perform electronic registration within the given period of time
   - failure to register after the end-date of discontinued studies
   - failure to register for courses after period of deferral
   - transfer to other faculty
   - withdrawal from studies
   - expulsion from the CTU

Dean of the Faculty

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.

LANGUAGE COURSES IN THE ENGLISH BACHELOR PROGRAMME IN PRAGUE:

It is obligatory for a student to attain a pass in the Czech language course as well as in a second foreign language course of his/her choice, i.e. German, French, Russian, or Spanish. The student qualifies for the examination only after he/she has been awarded all the required assessments ("zápočet" in Czech) in the respective language course. Students may also register for the third foreign language, but only after they have completed the obligatory language programme (consisting of Czech and second foreign language). Beginners courses of German are not offered.

Czech language course – duration: **beginners courses:** 3 semesters - 2 classes per week, opening in the 1st semester of the Bachelor Programme

German language course - duration: **intermediate and advanced course:** 3 semesters – 2 classes per week, opening in the 3rd semester of the Bachelor Programme

Other language courses (French, Russian, Spanish) - duration: **beginners course:** 5 semesters - 4 classes per week, opening in the 2nd semester of the Bachelor Programme

intermediate and advanced course: 3 semesters - 2 classes per week, opening in the 3rd semester of the Bachelor Programme

1st year				
Semester	winter	summer	credits	
Czech language for foreigners - beginners	0+2 z	0+2 z	2	2
Second foreign language - beginners	-	0+4 z	-	2
2nd year				
Semester	winter	summer	credits	
Czech language for foreigners - beginners	0+2 z, zk	-	2/4	-
Second foreign language - beginners	0+4 z	0+4 z	2	2
Second foreign language - intermediate	0+2 z	0+2 z	2	2
Second foreign language - advanced	0+2 z	0+2 z	2	2
3rd year				
Semester	winter	summer	credits	
Second foreign language - beginners	0+4 z	0+4 z, zk	2	2/3
Second foreign language - intermediate	0+2 z, zk	-	2/4	-
Second foreign language - advanced	0+2 z, zk	-	2/4	-

HOW TO REGISTER FOR FOREIGN LANGUAGE COURSES - DETAILS FOR EVERY YEAR OF THE BACHELOR PROGRAMME

Czech:		
beginners (Z)		
04XCESZ1	0+2 z	WS
04XCESZ2	0+2 z	SS
04XCESZ3	0+2 z	WS
04XCESZZK	zk	
z (zápočet) - assessment – 2 credits		
zk (zkouška) - examination – 4 credits		

Second foreign language:

German:				
intermediate (M)			*advanced (P)*	
04XNM1	0+2 z	WS	04XNP1	0+2 z
04XNM2	0+2 z	SS	04XNP2	0+2 z
04XNM3	0+2 z	WS	04XNP3	0+2 z
04XNMZK	zk		04XNPZK	zk
z (zápočet) - assessment – 2 credits			z (zápočet) - assessment – 2 credits	
zk (zkouška) - examination – 4 credits			zk (zkouška) - examination – 4 credits	

French:		
beginners (Z)		
04XFZ1	0+4 z	SS
04XFZ2	0+4 z	WS
04XFZ3	0+4 z	SS
04XFZ4	0+4 z	WS
04XFZ5	0+4 z	SS
04XFZZK	zk	
z (zápočet) - assessment – 2 credits		
zk (zkouška) - examination - 3 credits		

French:					
intermediate (M)			*advanced (P)*		
04XFM1	0+2 z	WS	04XFP1	0+2 z	
04XFM2	0+2 z	SS	04XFP2	0+2 z	
04XFM3	0+2 z	WS	04XFP3	0+2 z	
04XFMZK	zk		04XFPZK	zk	
z (zápočet) - assessment – 2 credits			z (zápočet) - assessment – 2 credits		
zk (zkouška) - examination – 4 credits			zk (zkouška) - examination – 4 credits		

Spanish:					
beginners (Z)					
04XSZ1	0+4 z	SS			
04XSZ2	0+4 z	WS			
04XSZ3	0+4 z	SS			
04XSZ4	0+4 z	WS			
04XSZ5	0+4 z	SS			
04XSZZK	zk				
z (zápočet) - assessment – 2 credits					
zk (zkouška) - examination – 3 credits					
intermediate (M)			*advanced (P)*		
04XSM1	0+2 z	WS	04XSP1	0+2 z	
04XSM2	0+2 z	SS	04XSP2	0+2 z	
04XSM3	0+2 z	WS	04XSP3	0+2 z	
04XSMZK	zk		04XSPZK	zk	
z (zápočet) - assessment – 2 credits			z (zápočet) - assessment – 2 credits		
zk (zkouška) - examination – 4 credits			zk (zkouška) - examination – 4 credits		

Russian:		
beginners (Z)		
04XRZ1	0+4 z	SS
04XRZ2	0+4 z	WS
04XRZ3	0+4 z	SS
04XRZ4	0+4 z	WS
04XRZ5	0+4 z	SS
04XRZZK	zk	
z (zápočet) - assessment – 2 credits		
zk (zkouška) - examination – 3 credits		

intermediate (M)			*advanced (P)*	
04XRM1	0+2 z	WS	04XRP1	0+2 z
04XRM2	0+2 z	SS	04XRP2	0+2 z
04XRM3	0+2 z	WS	04XRP3	0+2 z
04XRMZK	zk		04XRPZK	zk
z (zápočet) - assessment – 2 credits			z (zápočet) - assessment – 2 credits	
zk (zkouška) - examination – 4 credits			zk (zkouška) - examination – 4 credits	

For detailed information on language courses see Art. 6 of the Policies and Regulations for Bachelor´s and Master´s Degree Programmes at FNSPE and also Rules for Language Study available on the web pages of the Department of Humanities and Languages.

Bachelor´s Degree Programme

Physical Engineering

Specialization Physical Engineering of Materials 1st year

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Calculus	01MAN	Strachota, Pelantová	4+4 z	-	4	-
Calculus 1, examination (1)	01MANZ	Strachota, Pelantová	- zk	-	4	-
Linear Algebra 1	01LAL	Ambrož, Dvořáková	2+2 z	-	2	-
Linear Algebra 1, examination (2)	01LALZ	Ambrož, Dvořáková	- zk	-	2	-
Mechanics	02MECH	Břeň, Novotný P.	4+2 z	-	4	-
Mechanics, examination	02MECHZ	Břeň	- zk	-	2	-
History of Physics 1	02DEF1	Jex	2+0 z	-	2	-
Fundamentals of Programming	18ZPRO	Virius, Klinkovský	4 z	-	4	-
Preparatory week	00PT	FJFI	1 týden z	-	2	-
Calculus 2	01MAN2	Pelantová, Pošta	-	4+4 z, zk	-	8
Linear Algebra 2	01LAL2	Dvořáková, Ambrož	-	2+2 z, zk	-	4
Electricity and Magnetism	02ELMA	Hrivnák, Chadzitaskos	-	4+2 z, zk	-	6
Heat and Molecular Physics	02TER	Jizba, Zatloukal	-	2+2 z, zk	-	4
Introduction to Engineering	17UING	Frýbort, Haušild, Mušálek	2+1 kz	-	3	-
Language Courses (3)	04.	KHVJ	-	-	-	-
Optional courses:						
Minimum in Mathematics 1	00MAM1	Břeň	0+1 z	-	1	-
Minimum in Mathematics 2	00MAM2	Pošta	0+1 z	-	1	-
History of Physics 2	02DEF2	Jex, Myška	-	2+0 z	-	2
Fundamentals of Physical Measurements 1, 2	02ZM12	Chaloupka, Škoda	2+0 zk	0+4 kz	2	4
Creation of Electronic Documents	14TED	Materna	0+2 z	-	2	-
Introduction to UNIX	12UNXAP	Kuchařík	-	1+1 z	-	2
General Chemistry 1, 2 (4)	15CH12	Čuba, Distler	2+1 z	2+1 z, zk	3	3

(1) Examination in 01MANZ can be taken provided the assessment in 01MAN is obtained.
(2) Examination in 01LALZ can be taken provided the assessment in 01LAL is obtained.
(3) Enrollment in language courses follows the rules given separately.
(4) Enrollment in 15CH2 is possible only after passing 15CH1.

Bachelor´s Degree Programme

Physical Engineering

Specialization Physical Engineering of Materials 2nd year

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Calculus B 3, 4	01ANB34	Krbálek, Strachota	4+4 z, zk	2+4 z, zk	8	6
Numerical Methods 1	12NME1	Váchal	-	2+2 z, zk	-	4
Waves, Optics and Atomic Physics	02VOAF	Novotný P., Schmidt	4+2 z, zk	-	6	-
Thermodynamics and Statistical Physics	02TSFA	Jex, Novotný J.	-	2+2 z, zk	-	4
Teoretická fyzika 1(1)	02TEF1	Hrivnák, Novotný P.	2+2 z, zk	-	4	-
Engineering Mechanics	14TEM	Kunz	2+2 z, zk	-	4	-
Dynamics of Linear Systems	14DYLS	Kunz	-	1+1 z, zk	-	2
Electron Microscopy	14ELM	Karlík	-	2+0 kz	-	2
Language Courses (2)	04..	KHVJ	-	-	-	-
Required optional courses (3)						
Materials Characterization	14CHMA	Haušild, Tesař	2+1 kz	-	4	-
Experimental Laboratory 1, 2	02PRA12	Bielčík	0+4 kz	0+4 kz	6	6
Practicum in Materials	14PMA	Karlík, Tesař	-	0+2 kz	-	3
Social Sciences						
Rhetoric	00RET	Kovářová, Vadillo	-	0+2 z	-	1
Optional courses:						
Experimental Physics	02EXF	Křížková-Gajdošová	2+0 zk	-	2	-
Introduction to Probability 1, 2	01UP12	Krbálek, Vybíral	1+1 z, zk	1+1 z, zk	3	3
Seminar on Mathematical Physics	02SMF	Hlavatý	0+2 z	-	2	-
Basic Electronics 1, 2	12ZEL12	Pavel	2+1 z, zk	2+1 z, zk	3	3
Computer Algebra Systems	12PAS	Šiňor	1+1 z	-	2	-
Introduction to Scientific Computing	12UVP	Šiňor	-	1+1 z	-	2
Seminar on Solid State Physics	11SFIPL	Kalvoda	1+1 kz	-	2	-
Physical Training 1, 2	TV-12	ČVUT	- z	- z	1	1

(1) Examination in 02TEF1 can be taken only if 02MECHZ in passed.
(2) Enrollment in language courses follows the rules given separately.
(3) To obtain 6 credits at least is obligatory.

Bachelor´s Degree Programme

Physical Engineering

Specialization Physical Engineering of Materials 3rd year

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Equations of Mathematical Physics (1)	01RMAF	Klika, Tušek	4+2 z, zk	-	7	-
Fundamentals of Solid State Physics	11ZFPLA	Kalvoda, Mihóková	2+0 zk	-	2	-
Bachelor Project 1, 2	14BPFI12	Kalvoda, Kunz	0+5 z	0+10 z	5	10
Bachelor Seminar	11BSEM	Kalvoda, Havlíková	-	0+2 z	-	1
Quantum Physics	02KF	Jizba	2+1 z, zk	-	3	-
Probability and Statistics	01PRST	Hobza	3+1 z, zk	-	4	-
Elasticity 1	14EM1	Materna, Oliva	2+2 z, zk	-	5	-
Numerical Methods 2	01NME2	Beneš	-	2+0 kz	-	2
Metal Physics	14FKO	Čech, Karlík	-	4+2 z, zk	-	6
Practicum in Finite Elements Methods	14PMKOP	Materna	-	0+2 zk	-	3
Testing and Processing of Metals and Alloys	14ZZKOS	Lauschmann, Mušálek	-	2+2 z, zk	-	4
Language Courses (2)	04...	KHVJ	-	-	-	-
Optional courses:						
Instrumentation and Measurement	11ELEA	Jiroušek	-	2+0 z, zk	-	2
Physical Training 3, 4	TV-34	ČVUT	- z	- z	1	1
Structure of Solid State	11SPL	Kolenko, Kraus	2+2 z, zk	-	4	-
Applications of Group Theory in Solid State Physics	11APLG	Potůček	2+0 zk	-	2	-
Nanotechnology	12NT	Hulicius, Proška	2+0 zk	-	2	-
Programming in MATLAB	18PMTL	Kukal	0+4 kz	-	4	-
Fundamentals of Optics	12ZAOP	Kwiecien	2+0 z, zk	-	2	-

(1) Examination in 01RMAF can be taken only if all courses in Calculus and Linear Algebra are passed.
(2) Enrollment in language courses follows the rules given separately.

Bachelor´s Degree Programme

Physical Engineering

Specialization Plasma Physics and Thermonuclear Fusion 1st year

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Calculus	01MAN	Strachota, Pelantová	4+4 z	-	4	-
Calculus 1, examination (1)	01MANZ	Strachota, Pelantová	- zk	-	4	-
Linear Algebra 1	01LAL	Ambrož, Dvořáková	2+2 z	-	2	-
Linear Algebra 1, examination (2)	01LALZ	Ambrož, Dvořáková	- zk	-	2	-
Mechanics	02MECH	Břeň, Novotný P.	4+2 z	-	4	-
Mechanics, examination	02MECHZ	Břeň	- zk	-	2	-
Fundamentals of Programming	18ZPRO	Virius, Klinkovský	4 z	-	4	-
Preparatory week	00PT	FJFI	1 týden z	-	2	-
Calculus 2	01MAN2	Pelantová, Pošta	-	4+4 z, zk	-	8
Linear Algebra 2	01LAL2	Dvořáková, Ambrož	-	2+2 z, zk	-	4
Electricity and Magnetism	02ELMA	Hrivnák, Chadzitaskos	-	4+2 z, zk	-	6
Heat and Molecular Physics	02TER	Jizba, Petrásek	-	2+2 z, zk	-	4
Introduction to Laser Technology	12ULTB	Jelínková, Němec, Šulc	-	2+1 kz	-	3
Seminar on Plasma Physics	02SFP	Svoboda	-	0+2 z	-	2
Language Courses (3)	04..	KHVJ	-	-	-	-
Optional courses:						
Minimum in Mathematics 1	00MAM1	Břeň	0+1 z	-	1	-
Minimum in Mathematics 2	00MAM2	Pošta	0+1 z	-	1	-
History of Physics 1	02DEF1	Jex	2+0 z	-	2	-
Discrete Mathematics 1, 2 (4)	01DIM12	Masáková	2+0 z	2+0 z	2	2
History of Physics 2	02DEF2	Jex, Myška	-	2+0 z	-	2
Fundamentals of Physical Measurements 1, 2 (4)	02ZM12	Chaloupka, Škoda	2+0 zk	0+4 kz	2	4
Introduction to Solid State Physics	11UFPLN	Kolenko	-	2+0 zk	-	2
Physical Seminar 1	02FYS1	Svoboda	0+2 z	-	2	-
Fundamentals of Algorithmization	18ZALG	Virius	-	2+2 z, zk	-	4
General Chemistry 1, 2 (5)	15CH12	Čuba, Distler	2+1 z	2+1 z, zk	3	3
Introduction to Photonics and Nanostructures	12UFN	Kwiecien, Richter, Proška	-	2+1 kz	-	3

(1) Examination in 01MANZ can be taken provided the assessment in 01MAN is obtained.
(2) Examination in 01LALZ can be taken provided the assessment in 01LAL is obtained.
(3) Enrollment in language courses follows the rules given separately.
(4) The indicated courses can be scheduled simultaneously.
(5) Enrollment of 15CH2 is possible only after passing 15CH1.

Bachelor´s Degree Programme

Physical Engineering

Specialization Plasma Physics and Thermonuclear Fusion 2nd year

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Calculus B 3, 4	01ANB34	Krbálek, Strachota	4+4 z, zk	2+4 z, zk	8	6
Numerical Methods 1	12NME1	Váchal	-	2+2 z, zk	-	4
Waves, Optics and Atomic Physics	02VOAF	Novotný P., Schmidt	4+2 z, zk	-	6	-
Thermodynamics and Statistical Physics	02TSFA	Jex, Novotný J.	-	2+2 z, zk	-	4
Theoretical Physics 1(1)	02TEF1	Hrivnák, Novotný P.	2+2 z, zk	-	4	-
Experimental Laboratory 1, 2	02PRA12	Bielčík	0+4 kz	0+4 kz	6	6
Experimental Physics	02EXF	Óbertová, Adam	2+0 zk	-	2	-
Laboratory of Plasma Diagnostics	02UPP	Brotánková, Svoboda	-	0+2 kz	-	3
Language Courses (3)	04..	KHVJ	-	-	-	-
Social Sciences						
Rhetoric	00RET	Kovářová, Vadillo	-	0+2 z	-	1
Optional courses:						
Theoretical Physics 2 (2)	02TEF2	Hrivnák, Novotný P.	-	2+2 z, zk	-	4
Discrete Mathematics 3	01DIMA3	Dvořáková	2+0 zk	-	2	-
Introduction to Probability 1, 2	01UP12	Krbálek, Vybíral	1+1 z, zk	1+1 z, zk	3	3
Introduction to Elementary Particle Physics	02UFEC	Bielčík	2+0 z	-	2	-
Introduction to Curves and Surfaces 1	02UKP1	Hlavatý	-	1+1 z	-	2
Seminar on Mathematical Physics	02SMF	Hlavatý	0+2 z	-	2	-
Special Theory of Relativity	02STR	Břeň	-	2+0 zk	-	2
Basic Electronics 1, 2 (4)	12ZEL12	Pavel	2+1 z, zk	2+1 z, zk	3	3
Selected Topics in Modern Physics (4)	12VPMF	Pšikal	-	2+1 z	-	3
Programming in C++ 1, 2	18PRC12	Jarý, Virius	2+2 z	2+2 kz	4	4
Physical Training 1, 2	TV-12	ČVUT	- z	- z	1	1

(1) Examination in 02TEF1 can be taken only if 02MECHZ in passed.
(2) Examination in 02TEF2 can be taken only if 02ELMA and 02TEF1 are passed.
(3) Enrollment in language courses follows the rules given separately.
(4) The indicated courses can be scheduled simultaneously.

Bachelor´s Degree Programme

Physical Engineering

Specialization Plasma Physics and Thermonuclear Fusion 3rd year

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Equations of Mathematical Physics (1)	01RMAF	Klika, Tušek	4+2 z, zk	-	7	-
Fundamentals of Solid State Physics	11ZFPLA	Kalvoda, Mihóková	2+0 zk	-	2	-
Bachelor Project 1, 2	02BPTF12	Mlynář	0+5 z	0+10 z	5	10
Bachelor Seminar	11BSEM	Kalvoda, Havlíková	-	0+2 z	-	1
Probability and Statistics	01PRST	Hobza	3+1 z, zk	-	4	-
Quantum Physics	02KF	Jizba, Petrásek	2+1 z, zk	-	3	-
Vacuum Technology	12VKT	Petráček, Švejkar	2+2 kz	-	4	-
Fundamentals of Electrodynamics	12ZELD	Šiňor	1+1 z, zk	-	2	-
Fundamentals of Nuclear Physics	02ZJFY	Wagner	3+2 z, zk	-	5	-
Introduction to Computational Physics 1	12UPF1	Kuchařík, Liska	1+1 z, zk	-	2	-
Introduction to Nuclear Fusion	02UFU	Mlynář, Brotánková, Ficker	-	2+2 z, zk	-	4
Principles of Plasma Physics	12ZFP	Limpouch, Jirka	-	3+1 z, zk	-	4
Power Engineering	17ENER	Tichý	-	2+0 zk	-	2
Language Courses (2)	04...	KHVJ	-	-	-	-
Optional courses:						
Introduction to Curves and Surfaces 2	02UKP2	Hlavatý	1+1 z	-	2	-
Transport Phenomena/Nonequilibrium Systems	02TJNS	Jex	-	2+0 kz	-	2
Atomic and Molecular Spectroscopy	02AMS	Civiš	2+2 z, zk	-	4	-
Basic Optical Laboratory	12ZPOP	Jančárek	-	0+4 kz	-	6
Basic Laser Technology Laboratory (3)	12ZPLT	Blažej	-	0+4 kz	-	6
Measurement and Data Processing	12ZMDT	Blažej, Procházka	1+1 z, zk	-	2	-
Engineering Mechanics	14TEM	Kunz	2+2 z, zk	-	4	-
Fundamentals of Ionizing-Radiation Metrology	16MEZB	Čechák, Novotný P.	2+1 z, zk	-	4	-
Fundamentals of Radiation Dosimetry 1, 2	16ZDOZ12	Trojek	2+2 z, zk	2+0 zk	4	2
Fundamentals of Electronics	17ZEL	Kropík	2+2 kz	-	3	-
Molecular Physics	12MOF	Michl, Proška	-	2+0 zk	-	2
Physical Training 3, 4	TV-34	ČVUT	- z	- z	1	1

(1) Examination in 01RMAF can be taken only if all courses in Calculus and Linear Algebra are passed.
(2) Enrollment in language courses follows the rules given separately.
(3) Enrollment in 12ZPLT is possible only after passing 12ULTB.

Bachelor´s Degree Programme

Physical Engineering

Specialization Solid State Engineering 1st year

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Calculus	01MAN	Strachota, Pelantová	4+4 z	-	4	-
Calculus 1, examination (1)	01MANZ	Strachota, Pelantová	- zk	-	4	-
Linear Algebra 1	01LAL	Ambrož, Dvořáková	2+2 z	-	2	-
Linear Algebra 1, examination (2)	01LALZ	Ambrož, Dvořáková	- zk	-	2	-
Mechanics	02MECH	Břeň, Novotný P.	4+2 z	-	4	-
Mechanics, examination	02MECHZ	Břeň	- zk	-	2	-
History of Physics 1	02DEF1	Jex	2+0 z	-	2	-
Fundamentals of Programming	18ZPRO	Virius, Klinkovský	4 z	-	4	-
Preparatory week	00PT	FJFI	1 týden z	-	2	-
Calculus 2	01MAN2	Pelantová, Pošta	-	4+4 z, zk	-	8
Linear Algebra 2	01LAL2	Dvořáková, Ambrož	-	2+2 z, zk	-	4
Electricity and Magnetism	02ELMA	Hrivnák, Chadzitaskos	-	4+2 z, zk	-	6
Heat and Molecular Physics	02TER	Jizba, Zatloukal	-	2+2 z, zk	-	4
Introduction to Solid State Physics	11UFPLN	Kolenko	-	2+0 zk	-	2
Language Courses (3)	04.	KHVJ	-	-	-	-
Optional courses:						
Minimum in Mathematics 1	00MAM1	Břeň	0+1 z	-	1	-
Minimum in Mathematics 2	00MAM2	Pošta	0+1 z	-	1	-
History of Physics 2	02DEF2	Jex, Myška	-	2+0 z	-	2
Fundamentals of Physical Measurements 1, 2	02ZM12	Chaloupka, Škoda	2+0 zk	0+4 kz	2	4
Introduction to UNIX	12UNXAP	Kuchařík	-	1+1 z	-	2
General Chemistry 1, 2 (4)	15CH12	Čuba, Distler	2+1 z	2+1 z, zk	3	3
Introduction to Photonics and Nanostructures	12UFN	Kwiecien, Richter, Proška	-	2+1 kz	-	3
Creation of Electronic Documents	14TED	Materna	0+2 z	-	2	-
Fundamentals of GNU Plot	11GPL	Dráb	0+2 z	-	2	-
Basics of Algorithmization	18ZALG	Virius		2+2 z, zk		4
Programming in Python 1	18PPY1	Mojzeš		2 z		2

(1) Examination in 01MANZ can be taken provided the assessment in 01MAN is obtained.
(2) Examination in 01LALZ can be taken provided the assessment in 01LAL is obtained.
(3) Enrollment in language courses follows the rules given separately.
(4) Enrollment in 15CH2 is possible only after passing 15CH1.

Bachelor´s Degree Programme

Physical Engineering

Specialization Solid State Engineering 2nd year

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Calculus B 3, 4	01ANB34	Krbálek, Strachota	4+4 z, zk	2+4 z, zk	8	6
Numerical Methods 1	12NME1	Váchal	-	2+2 z, zk	-	4
Waves, Optics and Atomic Physics	02VOAF	Novotný P., Schmidt	4+2 z, zk	-	6	-
Thermodynamics and Statistical Physics	02TSFA	Jex, Novotný J.	-	2+2 z, zk	-	4
Structure of Solid State	11SPLA	Kolenko, Kraus	2+2 z, zk	-	4	-
Seminar on Solid State Physics	11SFIPL	Kalvoda	1+1 kz	-	2	-
Theoretical Physics 1(1), 2 (2)	02TEF12	Hrivnák, Novotný P.	2+2 z, zk	2+2 z, zk	4	4
GNU Programming	11GNU	Dráb	-	2+2 kz	-	4
Language Courses (3)	04..	KHVJ	-	-	-	-
Social Sciences						
Rhetoric	00RET	Kovářová, Vadillo	-	0+2 z	-	1
Optional courses:						
Experimental Physics	02EXF	Óbertová, Adam	2+0 zk	-	2	-
Introduction to Probability 1, 2	01UP12	Krbálek, Vybíral	1+1 z, zk	1+1 z, zk	3	3
Experimental Laboratory 1, 2	02PRA12	Bielčík	0+4 kz	0+4 kz	6	6
Seminar on Mathematical Physics	02SMF	Hlavatý	0+2 z	-	2	-
Basic Electronics 1	12ZEL1	Pavel	2+1 z, zk	-	3	-
Seminar on Computer Simulations	11SPS	Drahokoupil	-	0+2 z	-	2
Computer Algebra Systems	12PAS	Šiňor	1+1 z	-	2	-
Introduction to Scientific Computing	12UVP	Šiňor	-	1+1 z	-	2
Electron Microscopy	14ELM	Karlík	-	2+0 kz	-	2
Programming in Python 2	18PPY2	Klinkovský	2 z		2	
Programming in Python 3	18PPY3	Pecinovský		2 z		2
Physical Training 1, 2	TV-12	ČVUT	- z	- z	1	1

(1) Examination in 02TEF1 can be taken only if 02MECHZ in passed.
(2) Examination in 02TEF2 can be taken only if 02ELMA and 02TEF1 are passed.
(3) Enrollment in language courses follows the rules given separately.

Bachelor´s Degree Programme

Physical Engineering

Specialization Solid State Engineering 3rd year

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Equations of Mathematical Physics (1)	01RMAF	Klika, Tušek	4+2 z, zk	-	7	-
Fundamentals of Solid State Physics	11ZFPLA	Kalvoda, Mihóková	2+0 zk	-	2	-
Bachelor Project 1, 2	11BPFI12	Kalvoda	0+5 z	0+10 z	5	10
Bachelor Seminar	11BSEM	Kalvoda, Havlíková	-	0+2 z	-	1
Probability and Statistics	01PRST	Hobza	3+1 z, zk	-	4	-
Quantum Mechanics 1, 2	02KM12	Štefaňák	4+2 z, zk	4+2 z, zk	6	6
Diffraction Analysis of Solid State	11DAPL	Čapek, Ganev	2+0 zk	-	2	-
Practical Training in Solid State Physics	11CZF	Kučeráková	0+2 z	-	2	-
Applications of Group Theory in Solid State Physics	11APLG	Potůček	2+0 zk	-	2	-
Continuum in Solid State Physics	11KFPL	Seiner	-	2+0 zk	-	2
Solid State Physics – Applications and Analytical Methods	11MAPL	Kratochvílová	-	2+2 z, zk	-	4
Introduction to Condensed Matter Simulations	11ZSKL	Drahokoupil, Kalvoda	-	1+1 kz	-	2
Language Courses (2)	04...	KHVJ	-	-	-	-
Optional courses:						
Linear Circuit Analysis	11ANEL	Jiroušek, Levinský	4+0 z, zk	-	4	-
Logical Circuits and Microprocessors	11MIK	Jiroušek, Levinský	-	4+0 z, zk	-	4
Structure and Function of Bio-Molecules	11SFBM	Koval	2+1 z, zk	-	3	-
Atomic and Molecular Spectroscopy	02AMS	Civiš	2+2 z, zk	-	4	-
Transport Phenomena/Nonequilibrium Systems	02TJNS	Jex	-	2+0 kz	-	2
Molecular Physics	12MOF	Michl, Proška	-	2+0 zk	-	2
Fundamentals of Optics	12ZAOP	Kwiecien	2+0 z, zk	-	2	-
Fundamentals of Photonic Structures	12ZFS	Čtyroký, Richter	-	2+0 z, zk	-	2
Nanotechnology	12NT	Hulicius, Proška	2+0 zk	-	2	-
Programming in MATLAB	18PMTL	Kukal	0+4 kz	-	4	-
Vacuum Technology	12VKT	Petráček, Švejkar	2+2 kz	-	4	-
Principles of Plasma Physics	12ZFP	Limpouch	-	3+1 z, zk	-	4
Physical Training 3, 4	TV-34	ČVUT	- z	- z	1	1

(1) Examination in 01RMAF can be taken only if all courses in Calculus and Linear Algebra are passed.
(2) Enrollment in language courses follows the rules given separately.

Bachelor´s Degree Programme

Nuclear and Particle Physics

1st year

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Calculus	01MAN	Strachota, Pelantová	4+4 z	-	4	-
Calculus 1, examination (1)	01MANZ	Strachota, Pelantová	- zk	-	4	-
Linear Algebra 1	01LAL	Ambrož, Dvořáková	2+2 z	-	2	-
Linear Algebra 1, examination (2)	01LALZ	Ambrož, Dvořáková	- zk	-	2	-
Mechanics	02MECH	Břeň, Novotný P.	4+2 z	-	4	-
Mechanics, examination	02MECHZ	Břeň	- zk	-	2	-
Fundamentals of Physical Measurements 1, 2	02ZM12	Chaloupka, Škoda	2+0 zk	0+4 kz	2	4
Preparatory week	00PT	FJFI	1 týden z	-	2	-
Fundamentals of Programming	18ZPRO	Virius, Klinkovský	4 z	-	4	-
Linear Algebra 2	01LAL2	Dvořáková, Ambrož	-	2+2 z, zk	-	4
Calculus 2	01MAN2	Pelantová, Pošta	-	4+4 z, zk	-	8
Electricity and Magnetism	02ELMA	Hrivnák, Chadzitaskos	-	4+2 z, zk	-	6
Heat and Molecular Physics	02TER	Jizba, Petrásek	-	2+2 z, zk	-	4
Language Courses (3)	04..	KHVJ	-	-	-	-
Optional courses:						
Minimum in Mathematics 1	00MAM1	Břeň	0+1 z	-	1	-
Minimum in Mathematics 2	00MAM2	Pošta	0+1 z	-	1	-
History of Physics 1	02DEF1	Jex, Myška	2+0 z	-	2	-
General Chemistry 1, 2 (4)	15CH12	Čuba, Distler	2+1 z	2+1 z, zk	3	3
History of Physics 2	02DEF2	Jex, Myška	-	2+0 z	-	2
Physical Seminar 1	02FYS1	Svoboda	0+2 z	-	2	-
Introduction to Engineering	17UING	Frýbort, Haušild, Mušálek	2+1 kz	-	3	-
Introduction to UNIX	12UNXAP	Kuchařík	-	1+1 z	-	2
Basics of Algorithmization	18ZALG	Virius	-	2+2 z, zk	-	4

(1) Examination in 01MANZ can be taken provided the assessment in 01MAN is obtained.
(2) Examination in 01LALZ can be taken provided the assessment in 01LAL is obtained.
(3) Enrollment in language courses follows the rules given separately.
(4) Enrollment in 15CH2 is possible only after passing 15CH1.

Bachelor´s Degree Programme

Nuclear and Particle Physics

2nd year

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Calculus B 3, 4	01ANB34	Krbálek, Strachota	4+4 z, zk	2+4 z, zk	8	6
Numerical Methods 1	12NME1	Váchal	-	2+2 z, zk	-	4
Waves, Optics and Atomic Physics	02VOAF	Novotný P., Schmidt	4+2 z, zk	-	6	-
Theoretical Physics 1(1), 2 (2)	02TEF12	Hrivnák, Novotný P.	2+2 z, zk	2+2 z, zk	4	4
Experimental Physics	02EXF	Óbertová, Adam	2+0 zk	-	2	-
Experimental Laboratory 1, 2	02PRA12	Bielčík	0+4 kz	0+4 kz	6	6
Thermodynamics and Statistical Physics	02TSFA	Jex, Novotný J.	-	2+2 z, zk	-	4
Language Courses (3)	04..	KHVJ	-	-	-	-
Social Sciences (4)						
Rhetoric	00RET	Kovářová, Vadillo	-	0+2 z	-	1
Optional courses:						
Introduction to Elementary Particle Physics	02UFEC	Bielčík	2+0 z	-	2	-
Introduction to Probability 1, 2	01UP12	Krbálek, Vybíral	1+1 z, zk	1+1 z, zk	3	3
Introduction to Curves and Surfaces 1	02UKP1	Hlavatý	-	1+1 z	-	2
Introduction to Quantum Theory	02UKT	Štefaňák	-	2+0 z	-	2
Special Theory of Relativity	02STR	Břeň	-	2+0 zk	-	2
Programming in C++ 1, 2	18PRC12	Jarý, Virius	2+2 z	2+2 kz	4	4
Physical Training 1, 2	TV-12	ČVUT	- z	- z	1	1

(1) Examination in 02TEF1 can be taken only if 02MECHZ in passed.
(2) Examination in 02TEF2 can be taken only if 02ELMA and 02TEF1 are passed.
(3) Enrollment in language courses follows the rules given separately.

Bachelor´s Degree Programme

Nuclear and Particle Physics

3rd year

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Subatomic Physics	02SF	Čepila	4+2 z, zk	-	6	-
Quantum Mechanics 1, 2	02KM12	Štefaňák	4+2 z, zk	4+2 z, zk	6	6
Equations of Mathematical Physics (1)	01RMAF	Klika, Tušek	4+2 z, zk	-	7	-
Detectors and Detection Principles 1, 2	02DPD12	Contreras	2+0 zk	4+0 zk	2	4
Workshop 1 (3)	02VS1	Bielčík	1 týden z	-	1	-
Bachelor Thesis 1, 2	02BPJC12	Bielčík	0+5 z	0+10 z	5	10
Subatomic Physics 2	02SF2	Chaloupka	-	4+2 z, zk	-	6
Language Courses (2)	04...	KHVJ	-	-	-	-
Optional courses:						
Probability and Statistics	01PRST	Hobza	3+1 z, zk	-	4	-
Numerical Methods 2	01NME2	Beneš	-	2+0 kz	-	2
Fundamentals of Electronics	17ZEL	Kropík	2+2 kz	-	3	-
Introduction to Curves and Surfaces 2	02UKP2	Hlavatý	1+1 z	-	2	-
Tools for Simulation and Data Analysis 1	02NSAD1	Hubáček	2+0 z	-	2	-
Simulations and Data Analysis Tools 2	02NSAD2	Hubáček	-	2+0 z	-	2
Introduction to the Standard Model of Microworld	02ZSM	Hubáček	-	2+0 zk	-	2
Seminar on Quark-Gluon Plasma 1, 2	02ROZ12	Bielčík, Bielčíková, Tomášik	2+0 z	2+0 z	2	2
Scientific and Technical Computing	12VTV	Procházka	-	1+1 z	-	2
Functions of Complex Variable	01FKO	Šťovíček	-	2+1 z, zk	-	3
Scientific Programming in Python	12PYTH	Váchal	-	0+2 z	-	2
Vacuum Technology	12VKT	Švejkar, Petráček	2+2 kz	-	4	-
Physical Training 3, 4	TV-34	ČVUT	- z	- z	1	1

(1) Examination in 01RMAF can be taken only if all courses in Calculus and Linear Algebra are passed.
(2) Enrollment in language courses follows the rules given separately.
(3) The course is intended for students of this programme only.

Bachelor´s Degree Programme

Physical Engineering

Specialization Laser Technology and Photonics 1st year

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Calculus	01MAN	Strachota, Pelantová	4+4 z	-	4	-
Calculus 1, examination (1)	01MANZ	Strachota, Pelantová	- zk	-	4	-
Linear Algebra 1	01LAL	Ambrož, Dvořáková	2+2 z	-	2	-
Linear Algebra 1, examination (2)	01LALZ	Ambrož, Dvořáková	- zk	-	2	-
Mechanics	02MECH	Břeň, Novotný P.	4+2 z	-	4	-
Mechanics, examination	02MECHZ	Břeň	- zk	-	2	-
History of Physics 1	02DEF1	Jex	2+0 z	-	2	-
Fundamentals of Programming	18ZPRO	Virius, Klinkovský	4 z	-	4	-
Preparatory week	00PT	FJFI	1 týden z	-	2	-
Calculus 2	01MAN2	Pelantová, Pošta	-	4+4 z, zk	-	8
Linear Algebra 2	01LAL2	Dvořáková, Ambrož	-	2+2 z, zk	-	4
Electricity and Magnetism	02ELMA	Hrivnák, Chadzitaskos	-	4+2 z, zk	-	6
Heat and Molecular Physics	02TER	Jizba, Petrásek	-	2+2 z, zk	-	4
Language Courses (3)	04..	KHVJ	-	-	-	-
Required optional courses (4)						
Introduction to Laser Technology	12ULTB	Jelínková, Němec, Šulc	-	2+1 kz	-	3
Introduction to Photonics and Nanostructures	12UFN	Kwiecien, Richter, Proška	-	2+1 kz	-	3
Optional courses:						
Minimum in Mathematics 1	00MAM1	Břeň	0+1 z	-	1	-
Minimum in Mathematics 2	00MAM2	Pošta	0+1 z	-	1	-
History of Physics 2	02DEF2	Jex, Myška	-	2+0 z	-	2
Physical Seminar 1	02FYS1	Svoboda	0+2 z	-	2	-
Fundamentals of Physical Measurements 1, 2	02ZM12	Chaloupka, Škoda	2+0 zk	0+4 kz	2	4
Creation of Electronic Documents	14TED	Materna	0+2 z	-	2	-
Introduction to UNIX	12UNXAP	Kuchařík	-	1+1 z	-	2
General Chemistry 1, 2 (5)	15CH12	Čuba, Distler	2+1 z	2+1 z, zk	3	3
Introduction to Solid State Physics	11UFPLN	Kolenko	-	2+0 zk	-	2
Fundamentals of Algorithmization	18ZALG	Virius	-	2+2 z, zk	-	4

(1) Examination in 01MANZ can be taken provided the assessment in 01MAN is obtained.
(2) Examination in 01LALZ can be taken provided the assessment in 01LAL is obtained.
(3) Enrollment in language courses follows the rules given separately.
(4) At least one course is compulsory.
(5) Enrollment in15CH2 is possible only after passing 15CH1.

Bachelor´s Degree Programme

Physical Engineering

Specialization Laser Technology and Photonics 2nd year

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Calculus B 3, 4	01ANB34	Krbálek, Strachota	4+4 z, zk	2+4 z, zk	8	6
Numerical Methods 1	12NME1	Váchal	-	2+2 z, zk	-	4
Waves, Optics and Atomic Physics	02VOAF	Novotný P., Schmidt	4+2 z, zk	-	6	-
Thermodynamics and Statistical Physics	02TSFA	Jex, Novotný J.	-	2+2 z, zk	-	4
Theoretical Physics 1(1), 2 (1)	02TEF12	Hrivnák, Novotný P.	2+2 z, zk	2+2 z, zk	4	4
Experimental Laboratory 1, 2	02PRA12	Bielčík	0+4 kz	0+4 kz	6	6
Measurement and Data Processing	12ZMDT	Blažej, Procházka	1+1 z, zk	-	2	-
Laser Technology 1	12LTB1	Jelínková, Němec, Šulc	-	2+1 z, zk	-	3
Language Courses (3)	04..	KHVJ	-	-	-	-
Social Sciences (4)						
Rhetoric	00RET	Kovářová, Vadillo	-	0+2 z	-	1
Optional courses:						
Introduction to Scientific Computing	12UVP	Šiňor	-	1+1 z	-	2
Introduction to Probability 1, 2	01UP12	Krbálek, Vybíral	1+1 z, zk	1+1 z, zk	3	3
Computer Algebra Systems	12PAS	Šiňor	1+1 z	-	2	-
Basic Electronics 1, 2	12ZEL12	Pavel	2+1 z, zk	2+1 z, zk	3	3
Microprocessors 1, 2	12MPR12	Čech	4+0 zk	2+0 zk	4	2
Microprocessor Practicum 1, 2	12MPP12	Vyhlídal	0+3 kz	0+3 kz	4	2
Electron Microscopy	14ELM	Karlík	-	2+0 kz	-	2
Programming in C++ 1, 2	18PRC12	Jarý, Virius	2+2 z	2+2 kz	4	4
Physical Training 1, 2	TV-12	ČVUT	- z	- z	1	1
Selected Parts of Modern Physics	12VPMF	Pšikal	-	2+1 z	-	3
Scientific and Technical Calculation	12VTV	Procházka	-	1+1 z	-	2
Molecular Physics	12MOF	Michl, Proška	-	2+0 zk	-	2
Display of Physical Data	12ZFD	Blažej	1+1 kz	-	2	-

(1) Examination in 02TEF1 can be taken only if 02MECHZ in passed.
(2) Examination in 02TEF2 can be taken only if 02ELMA and 02TEF1 are passed.
(3) Enrollment in language courses follows the rules given separately.

Bachelor´s Degree Programme

Physical Engineering

Specialization Laser Technology and Photonics 3rd year

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Equations of Mathematical Physics (1)	01RMAF	Klika, Tušek	4+2 z, zk	-	7	-
Fundamentals of Solid State Physics	11ZFPLA	Kalvoda, Mihóková	2+0 zk	-	2	-
Bachelor Project 1, 2	12BPFI12	Havlíková	0+5 z	0+10 z	5	10
Bachelor Seminar	11BSEM	Kalvoda, Havlíková	-	0+2 z	-	1
Quantum Mechanics 1	02KM1	Štefaňák	4+2 z, zk	-	6	-
Fundamentals of Electrodynamics	12ZELD	Šiňor	1+1 z, zk	-	2	-
Fundamentals of Optics	12ZAOP	Kwiecien	2+0 z, zk	-	2	-
Laser Technology 2	12LTB2	Kubeček, Šulc, Jelínek	2+1 z, zk	-	3	-
Fundamentals of Photonic Structures	12ZFS	Čtyroký, Richter	-	2+0 z, zk	-	2
Basic Optical Laboratory	12ZPOP	Jančárek	-	0+4 kz	-	6
Basic Laser Technology Laboratory (3)	12ZPLT	Blažej	-	0+4 kz	-	6
Language Courses (2)	04...	KHVJ	-	-	-	-
Optional courses:						
Probability and Statistics	01PRST	Hobza	3+1 z, zk	-	4	-
Functions of Complex Variable	01FKO	Šťovíček	-	2+1 z, zk	-	3
Numerical Methods 2	01NME2	Beneš	-	2+0 kz	-	2
Introductory Practicum in Electronics 1, 2 (4)	12EPR12	Procházka	0+2 kz	0+2 kz	3	3
Vacuum Technology	12VKT	Švejkar, Petráček	2+2 kz	-	4	-
Quantum Mechanics 2	02KM2	Štefaňák	-	4+2 z, zk	-	6
Nanotechnology	12NT	Hulicius, Proška	2+0 zk	-	2	-
Operating Systems	12OSY	Čech	3+0 zk	-	3	-
Regulation and Sensors	12RSEN	Vyhlídal	4 z, zk	-	4	-
High Frequency and Pulse Technology	12VFT	Pavel	-	2+0 z, zk	-	2
Cryogenic Technology	12KRYO	Martínková	-	2+0 z	-	2
Laser Systems	12LAS	Kubeček	-	2+1 z, zk	-	3
Application of Lasers	12APL	Jančárek, Jelínková	2+0 z, zk	-	2	-
Principles of Plasma Physics	12ZFP	Limpouch, Jirka	-	3+1 z, zk	-	4
Physical Training 3, 4	TV-34	ČVUT	- z	- z	1	1

(1) Examination in 01RMAF can be taken only if all courses in Calculus and Linear Algebra are passed.
(2) Enrollment in language courses follows the rules given separately.
(3) For enrollment in 12ZPLT by students of other specializations, 12ULTB or 12LTB1 is a prerequisite.
(4) For enrollment in 12EPR12, 12ZEL12 is a prerequisite.

Bachelor´s Degree Programme

Physical Engineering

Specialization Computational Physics 1st year

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Calculus	01MAN	Strachota, Pelantová	4+4 z	-	4	-
Calculus 1, examination (1)	01MANZ	Strachota, Pelantová	- zk	-	4	-
Linear Algebra 1	01LAL	Ambrož, Dvořáková	2+2 z	-	2	-
Linear Algebra 1, examination (2)	01LALZ	Ambrož, Dvořáková	- zk	-	2	-
Mechanics	02MECH	Břeň, Novotný P.	4+2 z	-	4	-
Mechanics, examination	02MECHZ	Břeň	- zk	-	2	-
History of Physics 1	02DEF1	Jex	2+0 z	-	2	-
Fundamentals of Programming	18ZPRO	Virius, Klinkovský	4 z	-	4	-
Preparatory week	00PT	FJFI	1 týden z	-	2	-
Calculus 2	01MAN2	Pelantová, Pošta	-	4+4 z, zk	-	8
Linear Algebra 2	01LAL2	Dvořáková, Ambrož	-	2+2 z, zk	-	4
Electricity and Magnetism	02ELMA	Hrivnák, Chadzitaskos	-	4+2 z, zk	-	6
Heat and Molecular Physics	02TER	Jizba, Zatloukal	-	2+2 z, zk	-	4
Introduction to UNIX	12UNXAP	Kuchařík	-	1+1 z	-	2
Language Courses (3)	04.	KHVJ	-	-	-	-
Optional courses:						
Minimum in Mathematics 1	00MAM1	Břeň	0+1 z	-	1	-
Minimum in Mathematics 2	00MAM2	Pošta	0+1 z	-	1	-
History of Physics 2	02DEF2	Jex, Myška	-	2+0 z	-	2
Fundamentals of Physical Measurements 1, 2	02ZM12	Chaloupka, Škoda	2+0 zk	0+4 kz	2	4
Creation of Electronic Documents	14TED	Materna	0+2 z	-	2	-
General Chemistry 1, 2 (4)	15CH12	Čuba, Distler	2+1 z	2+1 z, zk	3	3
Fundamentals of Algorithmization	18ZALG	Virius	-	2+2 z, zk	-	4
Introduction to Laser Technology	12ULTB	Jelínková, Němec, Šulc	-	2+1 kz	-	3
Introduction to Photonics and Nanostructures	12UFN	Kwiecien, Richter, Proška	-	2+1 kz	-	3

(1) Examination in 01MANZ can be taken provided the assessment in 01MAN is obtained.
(2) Examination in 01LALZ can be taken the assessment in 01LAL is obtained.
(3) Enrollment in language courses follows the rules given separately.
(4) Enrollment in 15CH2 is possible only after passing 15CH1.

Bachelor´s Degree Programme

Physical Engineering

Specialization Computational Physics 2nd year

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Calculus B 3, 4	01ANB34	Krbálek, Strachota	4+4 z, zk	2+4 z, zk	8	6
Numerical Methods 1	12NME1	Váchal	-	2+2 z, zk	-	4
Waves, Optics and Atomic Physics	02VOAF	Novotný P., Schmidt	4+2 z, zk	-	6	-
Thermodynamics and Statistical Physics	02TSFA	Jex, Novotný J.	-	2+2 z, zk	-	4
Theoretical Physics 1(1), 2(2)	02TEF12	Hrivnák, Novotný P.	2+2 z, zk	2+2 z, zk	4	4
Computer Algebra Systems	12PAS	Šiňor	1+1 z	-	2	-
Measurement and Data Processing	12ZMDT	Blažej, Procházka	1+1 z, zk	-	2	-
Programming in C++ 1, 2	18PRC12	Jarý, Virius	2+2 z	2+2 kz	4	4
Introduction to Scientific Computing	12UVP	Šiňor	-	1+1 z	-	2
Selected Topics in Modern Physics	12VPMF	Pšikal	-	2+1 z	-	3
Language Courses (3)	04..	KHVJ	-	-	-	-
Social Sciences						
Rhetoric	00RET	Kovářová, Vadillo	-	0+2 z	-	1
Optional courses:						
Experimental Laboratory 1, 2	02PRA12	Bielčík	0+4 kz	0+4 kz	6	6
Seminar on Mathematical Physics	02SMF	Hlavatý	0+2 z	-	2	-
Basic Electronics 1, 2	12ZEL12	Pavel	2+1 z, zk	2+1 z, zk	3	3
Software Seminar 1, 2 (4)	01SOS12	Čulík	0+2 z	0+2 z	2	2
Introduction to Probability 1, 2	01UP12	Krbálek, Vybíral	1+1 z, zk	1+1 z, zk	3	3
Seminar on Solid State Physics	11SFIPL	Kalvoda	1+1 kz	-	2	-
Physical Training 1, 2	TV-12	ČVUT	- z	- z	1	1
Scientific and Technical Calculation	12VTV	Procházka	-	1+1 z	-	2
Molecular Physics	12MOF	Michl, Proška	-	2+0 zk	-	2
Display of Physical Data	12ZFD	Blažej	1+1 kz	-	2	-

(1) Examination in 02TEF1 can be taken only if 02MECHZ is passed.
(2) Examination in 02TEF2 can be taken only if 02ELMA and 02TEF1 are passed
(3) Enrollment in language courses follows the rules given separately.
(4) Contains fundamentals of JAVA.

Bachelor´s Degree Programme

Physical Engineering

Specialization Computational Physics 3rd year

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Equations of Mathematical Physics (1)	01RMAF	Klika, Tušek	4+2 z, zk	-	7	-
Fundamentals of Solid State Physics	11ZFPLA	Kalvoda, Mihóková	2+0 zk	-	2	-
Bachelor Project 1, 2	12BPFI12	Havlíková	0+5 z	0+10 z	5	10
Bachelor Seminar	11BSEM	Kalvoda, Mika Havlíková	-	0+2 z	-	1
Quantum Mechanics 1	02KM1	Štefaňák	4+2 z, zk	-	6	-
Fundamentals of Electrodynamics	12ZELD	Šiňor	1+1 z, zk	-	2	-
Computer Algebra	12POAL	Liska	1+1 kz	-	2	-
Introduction to Computational Physics 1, 2	12UPF12	Kuchařík, Liska	1+1 z, zk	1+1 z, zk	2	2
Fundamentals of Optics	12ZAOP	Kwiecien	2+0 z, zk	-	2	-
Principles of Plasma Physics	12ZFP	Limpouch, Jirka	-	3+1 z, zk	-	4
Scientific Programming in Python	12PYTH	Váchal	-	0+2 z	-	2
Introduction to Continuum Dynamics	01DYKO	Fučík, Strachota	-	2+1 z, zk	-	3
Language Courses (2)	04...	KHVJ	-	-	-	-
Optional courses:						
Administration of UNIX System	12AUX	Šiňor	-	2+0 kz	-	2
Nanotechnology	12NT	Hulicius, Proška	2+0 zk	-	2	-
Nuclear Physics B	02ZJFB	Wagner	3+0 kz	-	3	-
Programming in Java	18PJ	Virius	2+2 z, zk	-	5	-
LaTeX - Publication Instrument	01PSL	Ambrož	-	0+2 z	-	2
Fundamentals of Photonic Structures	12ZFS	Čtyroký, Richter	-	2+0 z, zk	-	2
Computer Graphics 1, 2	01PGR12	Strachota	1+1 z, zk	1+1 z, zk	2	2
Computer Networks 1, 2 (3)	01SITE12	Minárik	1+1 z	1+1 z	2	2
Introduction to Computer Security 1	01ZPB1	Vokáč	-	1+1 z	-	2
Practical Classes of Programming	18PROP	Klinkovský	0+2 kz	-	3	-
Machine Learning in Julia	00FEL	Adam, Mácha	1+2 kz	-	3	-
Physical Training 3, 4	TV-34	ČVUT	- z	- z	1	1
Quantum Mechanics 2	02KM2	Štefaňák	-	4+2 z, zk	-	6

(1) Examination in 01RMAF can be taken only if all courses in Calculus and Linear Algebra are passed.
(2) Enrollment in language courses follows the rules given separately
(3) Both parts must be enrolled.

Bachelor´s Degree Programme

Quantum Technologies

1st year

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Calculus	01MAN	Strachota, Pelantová	4+4 z	-	4	-
Calculus 1, examination	01MANZ	Strachota, Pelantová	- zk	-	4	-
Linear Algebra 1	01LAL	Ambrož, Dvořáková	2+2 z	-	2	-
Linear Algebra 1, examination	01LALZ	Ambrož, Dvořáková	- zk	-	2	-
Mechanics	02MECH	Břeň, Novotný P.	4+2 z	-	4	-
Mechanics, examination	02MECHZ	Břeň	- zk	-	2	-
History of Physics 1	02DEF1	Jex, Myška	2+0 z	-	2	-
Fundamentals of Programming	18ZPRO	Virius, Klinkovský	4 z	-	4	-
Preparatory week	00PT	FJFI	1 týden z	-	2	-
Fundamentals of Physical Measurements 1, 2	02ZM12	Chaloupka, Škoda	2+0 zk	0+4 kz	2	4
Calculus 2	01MAN2	Pelantová, Pošta	-	4+4 z, zk	-	8
Linear Algebra 2	01LAL2	Dvořáková, Ambrož	-	2+2 z, zk	-	4
Electricity and Magnetism	02ELMA	Hrivnák, Chadzitaskos	-	4+2 z, zk	-	6
Heat and Molecular Physics	02TER	Jizba, Petrásek	-	2+2 z, zk	-	4
Language Courses (1)	04.	KHVJ	-	-	-	-
Optional courses:						
Minimum in Mathematics 1	00MAM1	Břeň	0+1 z	-	1	-
Minimum in Mathematics 2	00MAM2	Pošta	0+1 z	-	1	-
History of Physics 2	02DEF2	Jex, Myška	-	2+0 z	-	2
Physical Seminar 1	02FYS1	Svoboda	0+2 z	-	2	-
Introduction to Solid State Physics	11UFPLN	Kolenko	-	2+0 zk	-	2
Introduction to Photonics and Nanostructures	12UFN	Kwiecien, Richter, Proška	-	2+1 kz	-	3
Introduction to UNIX	12UNXAP	Kuchařík	-	1+1 z	-	2
Creation of Electronic Documents	14TED	Materna	0+2 z	-	2	-
Introduction to Engineering	17UING	Frýbort, Haušild, Mušálek	2+1 kz	-	3	-

(1) Enrollment in language courses follows the rules given separately.

Bachelor´s Degree Programme

Quantum Technologies

2nd year

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Calculus B 3, 4	01ANB34	Krbálek, Strachota	4+4 z, zk	2+4 z, zk	8	6
Numerical Methods 1	12NME1	Váchal	-	2+2 z, zk	-	4
Waves, Optics and Atomic Physics	02VOAF	Novotný P., Schmidt	4+2 z, zk	-	6	-
Introduction to Laser Technology	12ULAT	Jelínková, Šulc	2 kz	-	2	-
Theoretical Physics 1(1), 2(2)	02TEF12	Hrivnák, Novotný P.	2+2 z, zk	2+2 z, zk	4	4
Experimental Laboratory 1, 2	02PRA12	Bielčík	0+4 kz	0+4 kz	6	6
Thermodynamics and Statistical Physics	02TSFA	Jex, Novotný J.	-	2+2 z, zk	-	4
Language Courses (3)	04	KHVJ	-	-	-	-
Social Sciences						
Rhetoric	00RET	Kovářová, Vadillo	-	0+2 z	-	1
Optional courses:						
Special Theory of Relativity	02STR	Břeň	-	2+0 zk	-	2
Introduction to Elementary Particle Physics	02UFEC	Bielčík	2+0 z	-	2	-
Introduction to Quantum Theory	02UKT	Štefaňák	-	2+0 z	-	2
Experimental Physics	02EXF	Óbertová, Adam	2+0 zk	-	2	-
Selected Topics in Modern Physics	12VPMF	Pšikal	-	2+1 z	-	3
Introduction to Scientific Computing	12UVP	Šiňor	-	1+1 z	-	2
Basic Electronics 1, 2	12ZEL12	Pavel	2+1 z, zk	2+1 z, zk	3	3
Programming in C++ 1, 2	18PRC12	Jarý, Virius	2+2 z	2+2 kz	4	4
Seminar on Solid State Physics	11SFIPL	Kalvoda	1+1 kz	-	2	-
Physical Training 1, 2	TV-12	ČVUT	- z	- z	1	1
Scientific and Technical Calculation	12VTV	Procházka	-	1+1 z	-	2
Molecular Physics	12MOF	Michl, Proška	-	2+0 zk	-	2

(1) Examination in 02TEF1 can be taken only if 02MECHZ is passed.
(2) Examination in 02TEF2 can be taken only if 02ELMA and 02TEF1 are passed
(3) Enrollment in language courses follows the rules given separately.

Bachelor´s Degree Programme

Quantum Technologies

3rd year

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Equations of Mathematical Physics(1)	01RMAF	Klika, Tušek	4+2 z, zk	-	7	-
Probability and Statistics	01PRST	Hobza	3+1 z, zk	-	4	-
Quantum Laboratory 1	11KPRA1	Kalvoda, Šulc	0+4 kz	-	4	-
Quantum Mechanics 1, 2	02KM12	Štefaňák	4+2 z, zk	4+2 z, zk	6	6
Fundamentals of Classical Optics and Electrodynamics	12KOE	Kwiecien, Richter, Šiňor	-	4+0 zk	-	4
Quantum Laboratory 2	02KPRA2	Čepila	-	0+4 kz	-	4
Bachelor Project 1, 2	02BPQT12	Hamrle, Štefaňák, Šulc	0+5 z	0+10 z	5	10
Language Courses (1)	04...	KHVJ	-	-	-	-
Optional courses:						
Tools for Simulations and Data Analysis 12	02NSAD12	Hubáček	2+0 z	2+0 z	2	2
Functions of Complex Variable	01FKO	Šťovíček	-	2+1 z, zk	-	3
Vacuum Technology	12VKT	Švejkar, Petráček	2+2 kz	-	4	-
Scientific Programming in Python	12PYTH	Váchal	-	0+2 z	-	2
Scientific and Technical Computing	12VTV	Procházka	-	1+1 z	-	2
Detectors and Detection Principles 1, 2	02DPD12	Contreras	2+0 zk	4+0 zk	2	4
Fundamentals of Solid State Physics	11ZFPLA	Kalvoda, Mihóková	2+0 zk	-	2	-
Basic Laser Technology Laboratory	12ZPLT	Blažej	-	0+4 kz	-	6
Laser Systems	12LAS	Kubeček	-	2+1 z, zk	-	3
Physical Training 3, 4	TV-34	ČVUT	- z	- z	1	1
Fundamentals of Photonic Structures	12ZFS	Čtyroký, Richter	-	2+0 z, zk	-	2

(1) Examination in 01RMAF can be taken only if all courses in Calculus and Linear Algebra are passed.
(2) Enrollment in language courses follows the rules given separately.

Master´s Degree Programme

Nuclear Engineering

Specialization Applied Physics of Ionizing Radiation 1st year

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Quantum Physics	02KFM	Jizba	2+1 z, zk	-	3	-
Nuclear Safety	17JABE	Frýbortová, Sklenka	4+0 zk	-	5	-
Research Project 1, 2	16VUJI12	Trojek	0+6 z	0+8 kz	6	8
Advanced Experimental Neutron Physics	17PENF	Huml	-	1+3 kz	-	4
Advanced Topics in Nuclear and Radiation Physics	16PPJRF	Musílek, Urban	2+1 z, zk	-	3	-
Instrumentation for Radiation Measurements	16MERV	Průša	2+2 z, zk	-	4	-
Practicum in Detection and Dosimetry of Ionizing Radiation	16PDZNMS	Martinčík, Průša	0+4 kz	-	4	-
Accelerators in Medicine and Technology	16UMT	Augsten	1+0 kz	-	1	-
Monte Carlo Method in Radiation Physics	16MCRF	Klusoň, Urban	-	2+2 z, zk	-	4
Ionizing Radiation in the Environment	16IZZP	Štěpán, Vrba T.	-	2+1 z, zk	-	3
Integral Dosimetry Methods	16IDOZ	Ambrožová, Musílek	-	2+0 zk	-	2
Methods of Analytical Measurement	16AMMN	Pilařová, Průšová	-	2+0 kz	-	2
Excursion	16EX	Thinová	-	1 týden z	-	2
Optional courses:						
Radiation Effects in Matter	16REL	Pilařová	2+0 zk	-	2	-
Treatment of Experimental Data	16ZED	Pilařová	-	2+0 zk	-	2
Monte Carlo Method	18MEMC	Jarý, Virius	2+2 z, zk	-	4	-
Radiation Protection	16RAO	Vrba T.	4+0 zk	-	4	-
Practicum in Dosimetry of Ionizing Radiation	16PDIZ	Štěpán	-	0+4 kz	-	4
Digital Image Processing	01DIZO	Flusser, Zitová	-	2+2 zk	-	4
Fundamentals of Clinical Dosimetry	16ZKLD	Čechák, Hanušová, Novotný J.	-	2+0 zk	-	2

Master´s Degree Programme

Nuclear Engineering

Specialization Applied Physics of Ionizing Radiation 2nd year

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Metrology of Ionizing Radiation	16MEIZ	Novotný P., Trojek	2+1 z, zk	-	4	-
Applications of lonizing Radiation 1	16APIZ1	Čechák, Trojek	3+0 zk	-	3	-
Master Thesis 1, 2	16DPJI12	Trojek	0+10 z	0+20 z	10	20
Applications of lonizing Radiation 2	17APIZ2	Miglierini, Štefánik	-	2+1 z, zk	-	3
Spectrometry in Dosimetry	16SPD	Čechák, Novotný P.	2+0 zk	-	2	-
Mathematical Methods and Modelling	16MMM	Klusoň, Urban	0+2 z	-	2	-
Medical Application of Ionizing Radiation	16AIZM	Hanušová, Jelínek-Michaelidesová	2+1 z, zk	-	3	-
Microdosimetry	16MDOZI	Jelínek-Michaelidesová, Pachnerová-Brabcová	2+0 kz	-	2	-
Overview of Elementary Particle Physics	16PFE	Smolík	2+0 kz	-	2	-
Seminar 2	16SEM2	Pilařová	-	0+2 z	-	2
Optional courses:						
Neutron Dosimetry	16DNEU	Ploc	2+0 zk	-	2	-
Clinical Dosimetry	16KLD2	Hanušová, Novotný J., Trojek	2+0 kz	-	2	-
Machine Learning 1	01SU1	Flusser	2+1 zk	-	3	-
Dosimetry of Internal Radiation Sources	16DZAR	Musílek	-	2+0 zk	-	2
Radiobiology	16RBIO	Davídková	-	2+0 zk	-	2
Introduction to Physics of Scintillators and Phosphors	16FSC	Nikl	-	2+0 zk	-	2
Design of Semiconductor Detectors of Ionizing Radiation	16KPD	Kákona	-	0+3 z	-	3
Start-up Project	01SUP	Rubeš	2+0 kz	-	2	-

Master´s Degree Programme

Physical Electronics

Specialization Photonics 1st year

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
Computational Physics 1	12PF1	Klimo, Kuchařík	2+0 zk	-	2	-
Research Project 1, 2	12VUFL12	Šiňor	0+6 z	0+8 kz	6	8
Optical Physics	12FOPT	Kwiecien	3+0 z, zk	-	3	-
Quantum Electronics	12KVEN	Richter, Dvořák	3+1 z, zk	-	5	-
Statistical Optics	12SOP	Richter	2+0 z, zk	-	2	-
Selected Chapters of Modern Optics	12MODO	Kwiecien, Marešová	2+0 z	-	2	-
Nonlinear Optics	12NOP	Richter	-	3+1 z, zk	-	4
Quantum Optics	12KOP	Richter, Dvořák	-	3+1 z, zk	-	5
Computer Control of Experiment	12POEX	Čech, Vyhlídal	-	2+0 z	-	2
Optical Spectroscopy	12OSP	Michl	-	2+0 kz	-	2
Optional courses:						
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 Plasma as Source of Radiation and Particles	12LPZ	Nejdl	2+0 zk	-	2	-
Solid-state, Diode and Dye lasers	12PDBL	Jelínková, Kubeček	-	2+0 z, zk	-	2
Nanochemistry	12NCH	Proška	2+0 zk	-	2	-
Preparation of Semiconductor Nanostructures	12PN	Hulicius	-	2+0 zk	-	2
Laser Physics	12FLA	Šulc	-	4+0 z, zk	-	4
Atomic Physics	12AF	Šiňor	4+0 z, zk	-	4	-
Molecular Nanosystems	11MONA	Kratochvílová	2+0 zk	-	2	-
Computational Physics 2	12PF2	Klimo, Kuchařík	-	1+1 z, zk	-	2
Quantum Information and Communication	02QIC	Gábris, Štefaňák	3+1 z, zk	-	4	-
Open Quantum Systems	02OKS	Novotný	-	2+0 z	-	2
Nano-Materials - Preparation and Properties	11NAMA	Kratochvílová	-	2+0 zk	-	2

Master´s Degree Programme

Physical Electronics

Specialization Photonics 2nd year

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Solid State Physics	11FYPL	Aubrechtová, Kučeráková, Kalvoda	3+1 z, zk	-	4	-
Master Thesis Seminar 1, 2	12DSFE12	Jelínková	0+2 z	0+2 z	2	2
Master Thesis 1, 2	12DPFE12	Jelínková	0+10 z	0+20 z	10	20
Nanophysics	12NF	Šiňor Richter	1+1 zk	-	2	-
Fourier Optics and Optical Signal Processing	12OZS	Kwiecien, Richter	3+0 z, zk	-	3	-
Advanced Optical Laboratory	12PPRO	Jančárek	0+4 kz	-	6	-
Geometrical Optics	12GOP	Dvořák	-	2+0 kz	-	2
Optional courses:						
Advanced Laser Spectroscopy (1)	12PLS	Michl	2+0 zk	-	2	-
Gas and X-ray Lasers	12RGL	Jančárek	-	2+0 kz	-	2
Advanced Laser Technology Laboratory	12PPLT	Kubeček, Němec	0+4 kz	-	6	-
Integrated Optics	12INTO	Čtyroký	2+0 z, zk	-	2	-
Optical Sensors	12OSE	Homola	-	2+0 zk	-	2
X-ray Photonics	12RFO	Pína	2 zk	-	2	-
Ultra-short Pulse Generation	12UKP	Jelínek, Kubeček	2+0 zk	-	2	-
Fiber Lasers and Amplifiers	12VLS	Peterka	2+0 zk	-	3	-
Computer Simulation of Condensed Matter	11SIKL	Kalvoda, Sedlák	2+2 z, zk	-	4	-
Physics of Surfaces and Interfaces	11FPOR	Kalvoda	2+0 zk	-	2	-
SEM and Methods of Microbeam Analysis	11SEM	Kopeček	2+0 zk	-	2	-
Start-up Project	01SUP	Rubeš	2+0 kz	-	2	-

Master´s Degree Programme

Plasma Physics and Thermonuclear Fusion

1st year

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	Řezáč	-	2+1 z, zk	-	3
Computational Physics 1	12PFTF1	Klimo, Kuchařík	-	1+1 z, zk	-	2
Technology of Thermonuclear Facilities	02TTJZ	Entler	-	3+0 zk	-	3
Inertial Fusion Physics	12FIF	Klimo, Limpouch	3+1 z, zk	-	4	-
Physics of Tokamaks	02FT	Mlynář, Břeň	3+1 z, zk	-	4	-
Atomic and Molecular Physics	02AMF	Břeň	2+2 z, zk	-	4	-
Materials Science	14NAMA	Čech, Haušild	2+1 kz	-	3	-
Materials Science for Reactors	14NMR	Haušild	-	2+0 zk	-	2
Laboratory Work in Plasma Physics 1, 2	02PRPL12	Brotánková, Svoboda	0+2 z	0+2 kz	2	2
Research Project 1, 2	02VUTF12	Mlynář	0+6 z	0+8 kz	6	8
Optional courses:						
Topics in Magnetic Confinement Fusion	02PMCF	Mlynář	-	0+2 kz	-	2
Superconductivity and Low Temperature	11SUPR	Janů, Ledinský	4+0 zk	-	4	-
Low Temperature Plasmas and Discharges	12NIPL	Nejdl	4+0 z, zk	-	4	-
Differential Equations on Computer	12DRP	Liska	2+2 z, zk	-	5	-
Computer Control of Experiment	12POEX	Čech, Vyhlídal	-	2+0 z	-	2
Optical Spectroscopy	12OSP	Michl	-	2+0 kz	-	2
Nuclear Technology Devices	16ZJT	Augsten, Čechák	2+0 zk	-	2	-
Winter (Summer) School of Plasma Physics and Fusion Physics 1, 2 (1)	02ZLSTF12	Svoboda	1 týden z	1 týden z	1	1
Computer Modelling of Plasma	02PMPL	Plašil	-	2+1 z, zk	-	3

(1) The course is intended for students of this program only.

Master´s Degree Programme

Plasma Physics and Thermonuclear Fusion

2nd year

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Computational Physics 2	12PFTF2	Klimo, Kuchařík	2+0 z, zk	-	2	-
Seminar FPTF 1, 2	02STFU12	Čeřovský, Mlynář	0+2 z	0+2 z	2	2
ITER and the Accompanying Programme	02ITERA	Mlynář	-	2+0 zk	-	2
Pinches	02PINCE	Klír	2+0 zk	-	2	-
Thermonuclear Fusion and Society	02TFS	Svoboda	-	2+0 z	-	2
Master Thesis 1, 2	02DPTF12	Mlynář	0+10 z	0+20 z	10	20
Optional courses:						
Mathematical Modelling of Non-linear Systems	01MMNS	Beneš	1+1 zk	-	3	-
Laser Plasma as Source of Radiation and Particles	12LPZ	Nejdl	2+0 zk	-	2	-
Computer Simulations in Physics of Many Particles 1, 2	12SFMC12	Předota, Houdek	3+1 z, zk	2+0 zk	4	2
Neutron Dosimetry	16DNEU	Ploc	2+0 zk	-	2	-
Introduction to Environment	16ZIVO	Čechák, Thinová	2+0 kz	-	2	-
Radiation Effects in Matter	16REL	Pilařová	2+0 zk	-	2	-
Start-up Project	01SUP	Rubeš	2+0 kz	-	2	-

Master´s Degree Programme

Solid State Engineering

1st year

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Solid State Theory 1	11TPL1	Hamrle, Kalvoda	4+0 zk	-	6	-
Physics of Metals	11FKOV	Seiner	2+0 zk	-	2	-
Semiconductor Physics	11POLO	Potůček	4+0 zk	-	4	-
Seminar and Educational Trips 1	11SMEX1	Drahokoupil, Kolenko	2+2 z	-	4	-
Research Project 1	11VUIP1	Kalvoda	0+6 z	-	6	-
Solid State Theory 2	11TPL2	Hamrle, Kalvoda	-	2+0 zk	-	3
Seminar on Solid State Theory	11STPL	Sedlák, Seiner, Repček	-	0+2 kz	-	2
Physics of Dielectrics	11FDEL	Bryknar, Mihóková	-	2+0 zk	-	2
Physics of Magnetic Materials	11FMGL	Hamrle, Zajac	-	2+0 zk	-	2
Seminar and Educational Trips 2	11SMEX2	Drahokoupil, Kolenko	-	2+2 z	-	4
Research Project 2	11VUIP2	Kalvoda	-	0+8 kz	-	8
Required optional courses (1)						
Practical Training in Solid State Structure Analysis	11PSPL	Čapek, Kučeráková	0+4 kz	-	4	-
Practical Training in Electronics	11EP	Jiroušek	0+4 kz	-	4	-
Laboratory Trainings in Solid State Physics	11PPOL	Levinský	-	0+4 kz	-	4
Optional courses:						
Real Time Software	11RTSW	Dráb, Jiroušek	-	2+0 z	-	2
Superconductivity and Low Temperature	11SUPR	Janů, Ledinský	4+0 zk	-	4	-
Chemical Aspects of Solids	11CHA	Knížek	2+0 zk	-	2	-
Metallic Oxides	11KO	Hejtmánek	-	2+0 zk	-	2
Physics of Solid State Phase Transitions	11FPPL	Hlinka	-	2+0 zk	-	2
Neutron Diffractometry	11AND	Kučeráková, Vratislav	2+0 zk	-	2	-
Diffraction Methods of Structural Biology	11DMSX	Dohnálek	-	2+1 z, zk	-	3
Quantum Optics	12KOP	Richter, Dvořák	-	3+1 z, zk	-	5
Molecular Nanosystems	11MONA	Kratochvílová	2+0 zk	-	2	-
Optical Spectroscopy of Inorganic Solids	11OSAL	Potůček	-	2+0 zk	-	2
Selected Topics in Structure of Condensed Matter	11VPSX	Drahokoupil	-	1+1 z, zk	-	2
Nano-Materials - Preparation and Properties	11NAMA	Kratochvílová	-	2+0 zk	-	2
Resonance Spectroscopy of Solid State	11RSPL	Buryi	2+0 zk	-	2	-

(1) At least one course must be enrolled.

Master´s Degree Programme

Solid State Engineering

2nd year

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Computer Simulation of Condensed Matter	11SIKL	Kalvoda, Sedlák, Drahokoupil	2+2 z, zk	-	4	-
Optical Properties of Solids	11OPTX	Bryknar, Dragounová-Aubrechtová	2+0 zk	-	2	-
Physics of Surfaces and Interfaces	11FPOR	Kalvoda	2+0 zk	-	2	-
Intrinsic Dynamics of Materials	11VDM	Seiner	2+0 zk	-	2	-
Seminar and Educational Trips 3	11SMEX3	Drahokoupil, Kolenko	2+2 z	-	4	-
Master Thesis 1	11DPIP1	Kalvoda	0+10 z	-	10	-
Seminar and Educational Trips 4	11SMEX4	Drahokoupil, Kolenko	-	2+2 z	-	4
Master Thesis 2	11DPIP2	Kalvoda	-	0+20 z	-	20
Optional courses:						
Theory and Construction of Photovoltaic Cells	11PCPC	Pfleger	2+0 zk	-	2	-
Diffraction Analysis of Mechanical Stress	11DAN	Ganev, Kraus	2+0 zk	-	2	-
Neutronography in Material Research	11NMV	Kučeráková, Vratislav	-	2+0 zk	-	2
Smart Materials and Their Applications	11SMAM	Potůček, Sedlák	–	2+0 zk	–	2
Principles and Applications of Optical Sensors	11PAO	Aubrecht	-	2+0 zk	-	2
Magnetic Materials	11MAM	Heczko	2+0 zk	-	2	-
Practical course in optical spectroscopy of solids	11POSPL	Aubrechtová, Potůček	0+4 kz	-	4	-
Laboratory in Macromolecular Crystallography 1, 2	11PMK12	Koval	0+4 kz	0+4 kz	4	4
SEM and Methods of Microbeam Analysis	11SEM	Kopeček	2+0 zk	-	2	-
Practical Aspects of Point Defects Study	11PASD	Buryi	-	2+0 zk	-	2
Physics of Detection and Detectors of Optical Radiation	12FDD	Pína	2+0 zk	-	2	-
Start-up Project	01SUP	Rubeš	2+0 kz	-	2	-

Master´s Degree Programme

Nuclear and Particle Physics

1st year

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Quantum Field Theory 1, 2	02KTPA12	Jizba, Štefaňák, Zatloukal	4+2 z, zk	4+2 z, zk	8	8
Modern Detectors	02MTD	Adam	2+0 zk	-	2	-
Statistical Data Analysis 1, 2	02SZD12	Myška	2+2 z, zk	2+2 z, zk	4	4
Seminar 1, 2	02SE12	Bielčík	0+3 z	0+3 z	3	3
Research Project 1, 2	02VUJC12	Bielčík	0+6 z	0+8 kz	6	8
Detector Systems and Data Acquisition	02SDSD	Broz	-	2+0 zk	-	2
Required optional courses type A (1)						
Extreme States of Matter (2)	02EXSH	Bielčík, Šumbera	2+0 zk	-	2	-
Physics of Ultrarelativistic Nuclear Collisions (2)	02FUJS	Křižíková-Gajdošová	-	2+0 zk	-	2
Accelerators 1, 2 (3)	02UC12	Krůs	2+0 zk	2+0 zk	2	2
General Theory of Relativity (4)	02GTR	Tomášik	2+2 z, zk	-	4	-
Optional courses:						
Workshop 2	02VS2	Bielčík	1 týden z	-	1	-
Special Practicum 1, 2	02SPRA12	Čepila	0+4 kz	0+4 kz	6	6
Seminar on Quark-Gluon Plasma 3, 4	02ROZ34	Bielčík, Bielčíková, Tomášik	2+0 z	2+0 z	2	2
Physics of Atomic Nuclei	02FAJ	Adam, Veselý	-	4+0 zk	-	4
Topics in Theory of Probability for Physicists	02PRF	Šumbera	2+0 z	-	2	-
Astroparticle Physics 1, 2	02ACF12	Vícha	2+0 zk	2+0 zk	2	2
Monte Carlo Method	18MEMC	Jarý, Virius	2+2 z, zk	-	4	-
Selected Topics on Relativistic Nucleus-Nucleus Collisions	02VPJRS	Karpenko, Trzeciak	-	2+1 z, zk	-	3
Object Oriented Programming	18OOP	Virius	0+2 z	-	2	-
Data Science	01DAS	Franc	1+2 kz	-	3	-
Neural Networks and their Application	01NEUR1	Hakl, Holeňa	-	2+0 zk	-	2

(1) At least one of the groups E, I or T must be enrolled.
(2) Courses Experimental (E)
(3) Courses Instrumental (I)
(4) Courses Theoretical (T)

Master´s Degree Programme

Nuclear and Particle Physics

2nd year

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Fundamentals of Electroweak Theory	02ZELW	Bielčíková, Tomášik	3+2 z, zk	-	6	-
Seminar 3, 4	02SE34	Bielčík	0+3 z	0+3 z	3	3
Master Thesis 1, 2	02DPJC12	Bielčík	0+10 z	0+20 z	10	20
Quantum Chromodynamics	02ZQCD	Bielčíková, Tomášik	-	3+2 z, zk	-	6
Optional courses:						
Workshop 3	02VS3	Bielčík	1 týden z	-	1	-
Seminar on Quark-Gluon Plasma 5, 6	02ROZ56	Bielčík, Bielčíková, Tomášik	2+0 z	2+0 z	2	2
Materials in Experimental Nuclear Physics	02MAT	Škoda	2+0 zk	-	2	-
Nuclear Spectroscopy	02JSP	Wagner	-	2+2 z, zk	-	5
Physics behind Standard Model	02BSM	Hubáček	2+0 z	-	2	-
Computer Control of Experiments	17PRE	Kropík	2+1 z, zk	-	3	-
Matrix Lie Group Representations	02REP	Hrivnák	2+0 z	-	2	-
Applied Quantum Chromodynamics at High Energies	02AQCD	Nemčík	-	2+0 zk	-	2
Particle Plasma Accelerators	02LPA	Krůs	-	2+0 zk	-	2
Quantum Many-Body Problem in the Theory of Atomic Nuclei	02KMP	Veselý	2+0 zk	-	2	-
Start-up Project	01SUP	Rubeš	2+0 kz	-	2	-

Master´s Degree Programme
Nuclear Engineering
Specialization Nuclear Reactors — 1st year

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Quantum Physics	02KFM	Jizba	2+1 z, zk	-	3	-
Nuclear Safety	17JABE	Frýbortová, Sklenka	4+0 zk	-	5	-
Research Project 1, 2	16VUJI12	Trojek	0+6 z	0+8 kz	6	8
Advanced Experimental Neutron Physics	17PENF	Huml	-	1+3 kz	-	4
Nuclear Reactor Physics	17FARE	Fejt, Frýbort, Frýbortová	2+2 z, zk	-	4	-
Experimental Reactor Physics	17ERF	Rataj	1+3 kz	-	4	-
Thermohydraulics of Nuclear Reactors	17THYR	Kobylka	-	3+1 z, zk	-	4
Reactor Kinetics and Dynamics	17KID	Huml	-	2+2 z, zk	-	4
Core Physics and Fuel Management	17PRF	Frýbortová, Sklenka	-	2+1 z, zk	-	3
Required optional courses gruppe 1 (6)						
Nuclear Research Installations	17VYRE	Sklenka,Matoušková	2+2 zk	-	4	-
Stochastic Methods in Reactor Physics	17SMRF	Huml	2+2 kz	-	4	-
Deterministic Methods in Reactor Physics (1)	17DERF	Fejt, Frýbort	-	2+2 kz	-	4
Neutron Activation Analysis (2)	17NAA	Štefánik	-	2+2 kz	-	4
Required optional courses gruppe 2 (7)						
Gamma-ray Spectroscopy	17SPEK	Štefánik	2+2 kz	-	4	-
Materials Science	14NAMA	Čech, Haušild	2+1 kz	-	3	-
Materials Science for Reactors(3)	14NMR	Haušild	-	2+0 zk	-	2
Chemistry Programme of Nuclear Power Plants	15PCJE	Drtinová	3+0 z, zk	–	3	–
Optional courses:						
Digital Safety Systems of Nuclear Reactors	17CIBS	Kropík	2+0 z, zk	-	2	-
Economics of Nuclear Power Plants (4)	17EK	Starý	2+0 zk	-	2	-
Informatics for Modern Physicists (5)	17IMF	Havlůj	0+3 kz	-	3	-
Nuclear Fuel Cycle	17PALX	Losa, Sklenka, Starý	2+0 zk	-	2	-
Nuclear Legislation in Practice	17ALEP	Drábová	-	2+0 kz	-	2
Design and Equipment of Nuclear Power Plants	17KOJX	Rataj, Zácha	-	3+0 zk	-	3
Team project	17TYPR	Frýbort	2+2 kz	-	4	-

(1) To be enrolled only after passing 17FARE.
(2) To be enrolled only after passing 17SPEK.
(3) To be enrolled only after passing 14NMA
(4) The course can be enrolled only if 17ZEH is not passed.
(5) The course opens for 3 students at least. The enrollment must be performed at leats 3 workdays prior to the semester at the latest.

(6) At least two courses must be enrolled.
(7) At least one course must be enrolled.

Master´s Degree Programme

Nuclear Engineering

Specialization Nuclear Reactors 2nd year

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Metrology of Ionizing Radiation	16MEIZ	Novotný P., Trojek	2+1 z, zk	-	4	-
Applications of Ionizing Radiation 1	16APIZ1	Čechák, Trojek	3+0 zk	-	3	-
Master Thesis 1, 2	16DPJI12	Trojek	0+10 z	0+20 z	10	20
Applications of Ionizing Radiation 2	17APIZ2	Miglierini, Štefánik	-	2+1 z, zk	-	3
Thermomechanics of Nuclear Fuels	17TERP	Ševeček	2+2 z, zk	-	4	-
Internship in Nuclear Power Plant	17PAJE	Kropík	1 týden z	-	2	-
New Nuclear Sources	17NJZ	Bílý	3+0 zk	-	3	-
Required optional courses gruppe 1 (5)						
Safety Analyses of Nuclear Installations	17BAJZ	Fejt, Frýbortová	2+2 kz	-	4	-
Thermohydraulic Design of Nuclear Reactors (1)	17THAR	Kobylka	2+2 zk	-	4	-
Thermomechanical Design of Nuclear Fuels (2)	17TNAP	Ševeček	-	2+2 kz	-	4
Accidents in Nuclear Installations (3)	17HAV	Fejt, Frýbort, Rýdl	-	2+2 kz	-	4
Required optional courses gruppe 2 (6)						
Spent Nuclear Fuel and Radioactive Wastes	17VRAO	Losa	3+1 zk	-	4	-
Critical Experiment (4)	17KEX	Huml, Rataj	1+3 kz	-	4	-
Advanced Experimental Reactor Physics (4)	17PERF	Huml, Rataj	-	1+3 kz	-	4
Optional courses:						
Simulation of NPP Operational States	17SIPS	Kobylka	-	0+3 kz	-	3
Radiation Protection of Nuclear Facilities	17ROJ	Starý	-	2+0 zk	-	2
Start-up Project	01SUP	Rubeš	2+0 kz	-	2	-

(1) To be enrolled after passing 17THYR.
(2) To be enrolled after passing 17TERP.
(3) To be enrolled after passing 17JABE.
(4) To be enrolled after passing 17ERF.
(5) At least two courses must be enrolled.
(6) At least one course must be enrolled.

Master´s Degree Programme

Physical Electronics

Specialization Laser Physics and Technology 1st year

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
Computational Physics 1	12PF1	Klimo, Kuchařík	2+0 zk	-	2	-
Research Project 1, 2	12VUFL12	Šiňor	0+6 z	0+8 kz	6	8
Optical Physics	12FOPT	Kwiecien	3+0 z, zk	-	3	-
Quantum Electronics	12KVEN	Richter, Dvořák	3+1 z, zk	-	5	-
Open Resonators	12OREZ	Kubeček	2+1 z, zk	-	4	-
Nonlinear Optics	12NOP	Richter	-	3+1 z, zk	-	4
Laser Physics	12FLA	Šulc	-	4+0 z, zk	-	4
Solid-state, Diode and Dye lasers	12PDBL	Jelínková, Kubeček	-	2+0 z, zk	-	2
Computer Control of Experiment	12POEX	Čech, Vyhlídal	-	2+0 z	-	2
Optional courses:						
Statistical Optics	12SOP	Richter	2+0 z, zk	-	2	-
Geometrical Optics	12GOP	Dvořák	-	2+0 kz	-	2
Optical Spectroscopy	12OSP	Michl	-	2+0 kz	-	2
Quantum Optics	12KOP	Richter, Dvořák	-	3+1 z, zk	-	5
Physics of Detection and Detectors of Optical Radiation	12FDD	Pína	2+0 zk	-	2	-
X-ray Photonics	12RFO	Pína	2 zk	-	2	-
Laser Plasma as Source of Radiation and Particles	12LPZ	Nejdl	2+0 zk	-	2	-
Electronics 3	12EL3	Pavel	2+0 zk	-	2	-
Advanced Practicum in Electronics 1, 2	12EP12	Pavel	0+2 kz	0+2 kz	3	3

(1) Enrollment on12EP12 possible if 12EL3 is enrolled or passed.

Master´s Degree Programme

Physical Electronics

Specialization Laser Physics and Technology 2nd year

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Solid State Physics	11FYPL	Aubrechtová, Kučeráková, Kalvoda	3+1 z, zk	-	4	-
Master Thesis Seminar 1, 2	12DSFE12	Jelínková	0+2 z	0+2 z	2	2
Master Thesis 1, 2	12DPFE12	Jelínková	0+10 z	0+20 z	10	20
Ultra-short Pulse Generation	12UKP	Jelínek, Kubeček	2+0 zk	-	2	-
Advanced Laser Technology Laboratory	12PPLT	Kubeček, Němec	0+4 kz	-	6	-
Gas and X-ray Lasers	12RGL	Jančárek	-	2+0 kz	-	2
Optional courses:						
Electronics for Lasers	12ELA	Pavel	2+0 zk	-	2	-
Advanced Laser Spectroscopy	12PLS	Michl	2+0 zk	-	2	-
Fourier Optics and Optical Signal Processing	12OZS	Kwiecien, Richter	3+0 z, zk	-	3	-
Laser in Medicine	12PLM	Jelínková, Němec	-	4 kz	-	6
Advanced Optical Laboratory	12PPRO	Jančárek	0+4 kz	-	6	-
Laser, Plasma and Bundle Technologies	12LPST	Jančárek, Jelínková	-	2+2 zk	-	4
Fiber Lasers and Amplifiers	12VLS	Peterka	2+0 zk	-	3	-
Measurements Methods in Electronics and Optics	12MMEO	Pína	-	2+0 zk	-	2
Start-up Project	01SUP	Rubeš	2+0 kz	-	2	-

Master´s Degree Programme

Mathematical Physics

1st year

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Geometric Methods in Physics 2	02GMF2	Šnobl, Vysoký	-	2+2 z, zk	-	5
Finite Groups and Representations	02GR	Chadzitaskos	2+1 z, zk	-	3	-
Quantum Physics	02KFA	Jex I., Jex M.	-	4+2 z, zk	-	6
Quantum Field Theory 1, 2	02KTPA12	Jizba, Štefaňák, Zatloukal	4+2 z, zk	4+2 z, zk	8	8
Lie Algebras and Lie Groups	02LAG	Šnobl	4+2 z, zk	-	7	-
Research Project 1, 2	02VUMF12	Šnobl, Štefaňák	0+6 z	0+8 kz	6	8
Winter School of Mathematical Physics (1)	02ZS	Hrivnák	1 týden z	-	1	-
Optional courses:						
Quantum Information and Communication	02QIC	Gábris, Štefaňák	3+1 z, zk	-	4	-
Quantum Programming	02QPRGA	Gábris, Yalcinkaya	-	1+1 z	-	3
Functional Analysis 3	01FAN3	Šťovíček	2+2 z, zk	-	5	-
Theory of Random Processes	01NAH	Vybíral	3+0 zk	-	3	-
Variational Methods	01VAM	Beneš	1+1 zk	-	3	-
Advanced Topics of Quantum Theory	02PPKT	Exner	-	2+0 zk	-	2
Graph Theory	01TG	Volec, Pelantová	4+0 zk	-	5	-
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
Quantum Optics 1, 2	02KO12	Jex, Potoček	2+2 z, zk	2+2 z, zk	4	4
Open Quantum Systems	02OKS	Novotný	-	2+0 z	-	2

(1) For students of this field only.
(2) These courses alternate with each other. In the academic year 2023/2024 the course 02RMMF takes place.

Master´s Degree Programme

Mathematical Physics

2nd year

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Algebraic Topology	02ALT	Vysoký	2+2 z, zk	-	4	-
Master Thesis 1, 2	02DPMF12	Šnobl, Štefaňák	0+10 z	0+20 z	10	20
Master Thesis Seminar	02DSMF	Hrivnák	-	0+2 z	-	1
Selected Topics in Statistical Physics and Thermodynamics	02VPSFA	Jex, Novotný	4+2 z, zk	-	7	-
Optional courses:						
Relativistic Physics 1, 2	02REL12	Bičák, Semerák	4+2 z, zk	4+2 z, zk	6	6
Quantum Information and Communication	02QIC	Gábris, Štefaňák	3+1 z, zk	-	4	-
Integrability and beyond	02INB	Šnobl, Marchesiello	-	2+0 z	-	2
Physics of Graphene Described by Dirac Equation	02FG	Jakubský	-	2+0 z	-	2
Quantum chemistry	02KCH	Jex M.	2+1 z, zk	-	3	-
Quantum Groups 1	01KVGR1	Burdík	2+0 z	-	2	-
Mathematical Modelling of Non-linear Systems	01MMNS	Beneš	1+1 zk	-	3	-
Quantum Circle 1, 2	02KVK12	Exner	0+2 z	0+2 z	2	2
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
Geometrical Aspects of Spectral Theory	01SPEC	Krejčiřík	-	2+0 zk	-	2
Coxeter Groups	02COX	Hrivnák	2+0 z	-	2	-
Asymptotical Methods	01ASY	Mikyška	2+1 z, zk	-	3	-
Symmetry Groups of Quantum Systems	02GSKS	Tolar	2+0 zk	-	2	-
Seminar on Quantum Field Theory	02SKTP	Jizba	-	2+1 z	-	3

(1) These courses alternate according to regulations of the department. In the academic year 2023/2024 the course 02RMMF takes place.

Master´s Degree Programme

Physical Electronics

Specialization Computational Physics 1st year

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
Computational Physics 1	12PF1	Klimo, Kuchařík	2+0 zk	-	2	-
Research Project 1, 2	12VUFL12	Šiňor	0+6 z	0+8 kz	6	8
Differential Equations on Computer	12DRP	Liska	2+2 z, zk	-	5	-
Parallel Algorithms and Architectures	01PAA	Oberhuber	-	2+1 kz	-	4
Inertial Fusion Physics	12FIF	Klimo, Limpouch	3+1 z, zk	-	4	-
Computational Physics 2	12PF2	Klimo, Kuchařík	-	1+1 z, zk	-	2
Finite Element Method	01MKP	Beneš	-	1+1 zk	-	3
Fundamentals of Laser-Plasma Physics	12ZFLP	Klimo, Pšikal	-	2+0 zk	-	2
Digital Image Processing	01DIZO	Flusser, Zitová	-	2+2 zk	-	4
Optional courses:						
Object Oriented Programming	18OOP	Virius	0+2 z	-	2	-
Computer Simulations in Physics of Many Particles 1, 2	12SFMC12	Předota, Houdek	3+1 z, zk	2+0 zk	4	2
Quantum Electronics	12KVEN	Richter, Dvořák	3+1 z, zk	-	5	-
Quantum Optics	12KOP	Richter, Dvořák	-	3+1 z, zk	-	5
Laser Plasma as Source of Radiation and Particles	12LPZ	Nejdl	2+0 zk	-	2	-
Variational Methods	01VAM	Beneš	1+1 zk	-	3	-
Introduction to Mainframe	01UMF	Oberhuber	1+1 z	-	2	-
Mathematical Methods in Fluid Dynamics	01MMDY	Strachota	2+0 zk	-	2	-
Numerical Methods in Fluid Dynamics	01NMDT	Strachota	-	2+0 zk	-	2
Introduction to Computer Security 2	01ZPB2	Vokáč	1+1 z	-	2	-
Graph Theory	01TG	Volec, Pelantová	4+0 zk	-	5	-
Quantum Information and Communication	02QIC	Gábris, Štefaňák	3+1 z, zk	-	4	-

Master´s Degree Programme

Physical Electronics

Specialization Computational Physics 2nd year

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Solid State Physics	11FYPL	Aubrechtová, Kučeráková, Kalvoda	3+1 z, zk	-	4	-
Master Thesis Seminar 1, 2	12DSFE12	Jelínková	0+2 z	0+2 z	2	2
Master Thesis 1, 2	12DPFE12	Jelínková	0+10 z	0+20 z	10	20
Atomic Physics	12AF	Šiňor	4+0 z, zk	-	4	-
Robust Numerical Algorithms	12RNA	Váchal	1+1 z	-	2	-
Optional courses:						
Monte Carlo Method	18MEMC	Jarý, Virius	2+2 z, zk	-	4	-
Mathematical Modelling of Non-linear Systems	01MMNS	Beneš	1+1 zk	-	3	-
X-ray Photonics	12RFO	Pína	2 zk	-	2	-
Mathematical Logic	01MAL	Cintula	2+1 z, zk	-	4	-
Laser Plasma as Source of Radiation and Particles	12LPZ	Nejdl	2+0 zk	-	2	-
Machine Learning 1	01SU1	Flusser	2+1 zk	-	3	-
Nonlinear Optics	12NOP	Richter	-	3+1 z, zk	-	4
Neural Networks and their Application	01NEUR1	Hakl, Holeňa	-	2+0 zk	-	2
Start-up Project	01SUP	Rubeš	2+0 kz	-	2	-

Master´s Degree Programme

Quantum Technologies

1st year

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Quantum Information and Communication	02QIC	Gábris, Štefaňák	3+1 z, zk	-	4	-
Quantum Optics 1, 2	02KO12	Jex, Potoček	2+2 z, zk	2+2 z, zk	4	4
Quantum Field Theory 1, 2	02KTPA12	Jizba, Štefaňák, Zatloukal	4+2 z, zk	4+2 z, zk	8	8
Quantum Generators of Optical Radiation 1	12KGOZ1	Jelínek, Jelínková, Němec	2+0 zk	-	2	-
Quantum Generators of Optical Radiation 2	12KGOZ2	Šulc	-	2+2 z, zk	-	4
Theory of Solid State 1, 2	11TPLQ12	Hamrle, Seiner	2+2 z, zk	2+2 z, zk	4	4
Research Project 1, 2	02VUQT12	Hamrle, Štefaňák, Šulc	0+6 z	0+8 kz	6	8
Optional courses:						
Information Theory	01TIN	Hobza	2+0 zk	-	2	-
Graph Theory	01TG	Volec, Pelantová	4+0 zk	-	5	-
Quantum Programming	02QPRGA	Gábris, Yalcinkaya	-	1+1 z	-	3
Open Quantum Systems	02OKS	Novotný	-	2+0 z	-	2
Matrix Lie Group Representations	02REP	Hrivnák	2+0 z	-	2	-
Statistical Data Analysis 1, 2	02SZD12	Myška	2+2 z, zk	2+2 z, zk	4	4
Accelerators 1, 2	02UC12	Krůs	2+0 zk	2+0 zk	2	2
Advanced C++	18PCP	Virius	-	2+2 z, zk	-	4
Object Oriented Programming	18OOP	Virius	0+2 z	-	2	-
Monte Carlo Method	18MEMC	Jarý, Virius	2+2 z, zk	-	4	-
Superconductivity and Low Temperature	11SUPR	Janů, Ledinský	4+0 zk	-	4	-
Molecular Nanosystems	11MONA	Kratochvílová	2+0 zk	-	2	-
Nano-Materials - Preparation and Properties	11NAMA	Kratochvílová	-	2+0 zk	-	2
Statistical Optics	12SOP	Richter	2+0 z, zk	-	2	-
Nonlinear Optics	12NOP	Richter	-	3+1 z, zk	-	4

Master´s Degree Programme

Quantum Technologies

2nd year

Course	code	lecturer	win. sem.	sum. sem.	cr	cr
Compulsory courses:						
Quantum Field Theory 3	02KTPA3	Jizba, Zatloukal	4+2 z, zk	-	8	-
Master Thesis 1, 2	02DPQT12	Hamrle, Štefaňák, Šulc	0+10 z	0+20 z	10	20
Optional courses:						
Selected Topics in Statistical Physics and Thermodynamics	02VPSFA	Jex, Novotný	4+2 z, zk	-	7	-
Seminar on Quantum Field Theory	02SKTP	Jizba	-	2+1 z	-	3
Quantum Circle 1, 2	02KVK12	Exner	0+2 z	0+2 z	2	2
Quantum Chemistry	02KCH	Jex M.	2+1 z, zk	-	3	-
Physics of Graphene Described by Dirac Equation	02FG	Jakubský	-	2+0 z	-	2
Physics of Detection and Detectors of Optical Radiation	12FDD	Pína	2+0 zk	-	2	-
Open Resonators	12OREZ	Kubeček	2+1 z, zk	-	4	-
X-ray Photonics	12RFO	Pína	2 zk	-	2	-
Ultra-short Pulse Generation	12UKP	Jelínek, Kubeček	2+0 zk	-	2	-
Selected Chapters of Modern Optics	12MODO	Kwiecien, Marešová	2+0 z	-	2	-
Nanophysics	12NF	Šiňor, Richter	1+1 zk	-	2	-
Nonlinear Optics	12NOP	Richter	-	3+1 z, zk	-	4
Quantum Chromodynamics	02ZQCD	Bielčíková, Tomášik	-	3+2 z, zk	-	6
Fundamentals of Electroweak Theory	02ZELW	Bielčíková, Tomášik	3+2 z, zk	-	6	-
Computer Simulation of Condensed Matter	11SIKL	Kalvoda, Sedlák	2+2 z, zk	-	4	-
Physics of Surfaces and Interfaces	11FPOR	Kalvoda	2+0 zk	-	2	-
Optical Properties of Solids	11OPTX	Bryknar, Potůček	2+0 zk	-	2	-
Start-up Project	01SUP	Rubeš	2+0 kz	-	2	-