Study plan

Name of study plan: jaderné inženýrství - Radioaktivita v životním prost edí

Faculty/Institute/Others:

Department:

Branch of study guaranteed by the department: Welcome page

Garantor of the study branch:

Program of study: Nuclear Engineering

Type of study: Bachelor full-time

Required credits: 0

Elective courses credits: 180 Sum of credits in the plan: 180

Note on the plan:

Name of the block: Compulsory courses in the specialization

Minimal number of credits of the block: 0

The role of the block: PS

Code of the group: BSPJIRZP1

Name of the group: BS P_JIB RŽP 1st year

Requirement credits in the group:

Requirement courses in the group: In this group you have to complete at least 16 courses

Credits in the group: 0 Note on the group:

| Code | Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.) | Completion | Credits | Scope | Semester | Role |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------|-------|----------|------|
| 02DEF1 | History of Physics 1 Igor Jex Igor Jex (Gar.) | Z | 2 | 2+0 | Z | PS |
| 02ELMA | Electricity and Magnetism Iskender Yalcinkaya, Ji i Hrivnák, Goce Chadzitaskos, Josef Schmidt, Jan Vysoký Jan Vysoký Ji í Hrivnák (Gar.) | Z,ZK | 6 | 4+2 | L | PS |
| 01LAL | Linear Algebra 1 Petr Ambrož, Lubomíra Dvo áková Lubomíra Dvo áková (Gar.) | Z | 2 | 2P+2C | | PS |
| 01LALZ | Linear Algebra 1, exam Petr Ambrož, Lubomíra Dvo áková Lubomíra Dvo áková (Gar.) | ZK | 2 | 0P+0C | | PS |
| 01LAL2 | Linear Algebra 2 Petr Ambrož, Lubomíra Dvo áková Lubomíra Dvo áková (Gar.) | Z,ZK | 4 | 2P+2C | | PS |
| 01MAN | Calculus 1 Pavel Strachota, Miroslav Kolá, Edita Pelantová Pavel Strachota Pavel Strachota (Gar.) | Z | 4 | 4+4 | | PS |
| 01MANZ | Calculus 1, exam Pavel Strachota, Miroslav Kolá, Edita Pelantová Pavel Strachota Pavel Strachota (Gar.) | ZK | 4 | 0P+0C | | PS |
| 01MAN2 | Calculus 2 Miroslav Kolá, Edita Pelantová, Maksym Dreval Edita Pelantová Maksym Dreval (Gar.) | Z,ZK | 8 | 4P+4C | | PS |
| 02MECH | Mechanics David Be Antonín Hoskovec David Be (Gar.) | Z | 4 | 4+2 | Z | PS |
| 02MECHZ | Mechanics - Examination Iskender Yalcinkaya, Goce Chadzitaskos, Stanislav Skoupý, David Be, Filip Petrásek, Antonín Hoskovec, Petr Novotný Antonín Hoskovec David Be (Gar.) | ZK | 2 | - | Z | PS |
| 00PT | Preparatory Week Petr Ambrož, Milan Krbálek Petr Ambrož Petr Ambrož (Gar.) | Z | 2 | týden | Z | PS |
| 02TER | Heat and Molecular Physics Filip Petrásek Petr Novotný Petr Jizba (Gar.) | Z,ZK | 4 | 2+2 | L | PS |
| 16UJRF1 | Introductory Nuclear and Radiation Physics 1 Ladislav Musílek Ladislav Musílek (Gar.) | Z,ZK | 4 | 2P+2C | L | PS |
| 02ZM1 | Foundations of Physical Measurements 1 Solangel Rojas Torres, Petr Chaloupka Petr Chaloupka (Gar.) | ZK | 2 | 2P+0C | Z | PS |

| 8ZPRO | Basics of Programming Maksym Dreval, Nichita Vatamaniuc, Jan Vondruška, Vladimír Jarý, Miroslav Virius, Jakub Klinkovský, Petr Pauš, František Vold ich, Jan Tomsa, Miroslav Virius Miroslav Virius (Gar.) | Z | 4 | 4C | Z | PS |
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| s experimental science. | · | Drano. Copornio | uo, riopioi, c | Jamoo, Hayg | 0110. 1110 01 | rui oi pilyoloo |
| | Electricity and Magnetism | | | 7 | Z,ZK | 6 |
| | b's law, electrostatic field, Gauss' law. Electric dipole, polarization. Conductors and dielectr | ics Electric curr | ent and circu | | | - |
| - | proces, magnetic field. Magnetic dipole, magnetics. Electromagnetic induction, RLC circuits. | | | | - | or the relativit |
| | Linear Algebra 1 | | a. | /// on oquality | Z | 2 |
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| heorem. | r dependence and independence. 5. Dasis and dimension. 4. Subspaces of vector spaces. | . Э. Ешей шаррі | rigs. o. Matr | ces of lifear | mappings. | 7.110benius |
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| I I | Linear Algebra 2 and operator. 2. Permutation and determinant. 3. Spectral theory (eigenvalue, eigenvector | | -\ 4 !t! | | Z,ZK | |
| f determinants. 3. Calcu omplements. 6. Geomet | y. 6. Metric geometry. 7. Riesz theorem and adjoint operator. Outline of the exercises: 1. Metric geometry. 7. Riesz theorem and adjoint operator. Outline of the exercises: 1. Metric geometry. Canonical form. try exercises and examples. 7. Adjoint operators. Calculus 1 | | | | | |
| | ysis, functions of one real variable, differential calculus). | | | | _ | 4 |
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ΚZ

0P+4L

PS

Foundations of Physical Measurements 2
Petr Chaloupka Petr Chaloupka (Gar.)

02ZM2

Code of the group: BSPJIRZP2

Name of the group: BS P_JIB RŽP 2nd year

Requirement credits in the group:

Requirement courses in the group: In this group you have to complete at least 12 courses

Credits in the group: 0 Note on the group:

| Code | Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.) | Completion | Credits | Scope | Semester | Role |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------|-------|----------|------|
| 01ANB3 | Calculus B 3 Miroslav Kolá , Milan Krbálek Milan Krbálek Miroslav Kolá (Gar.) | Z,ZK | 8 | 4P+4C | | PS |

| 01ANB4 | Calculus B 4 Ji í Mikyška, Miroslav Kolá Ji í Mikyška | Z,ZK | 6 | 2P+4C | | PS |
|----------|----------------------------------------------------------------------------------------------------------|------|---|-------|---|----|
| 12NME1 | Numerical Methods 1 Pavel Váchal Pavel Váchal (Gar.) | Z,ZK | 4 | 2+2 | L | PS |
| 16PNZ | Problems of Non-ionizing Radiation Kamil Augsten Kamil Augsten Lenka Thinová (Gar.) | KZ | 2 | 2P+0C | Z | PS |
| 16PSE | Topical Dosimetry Seminar Kate ina Pila ová Kate ina Pila ová (Gar.) | Z | 2 | 0P+2C | | PS |
| 18PMTL | Programming in MATLAB Mat j Pokorný, Quang Van Tran, Jaromír Kukal Quang Van Tran Jaromír Kukal (Gar.) | KZ | 4 | 4C | Z | PS |
| 16ZIVB | Introduction to Ecology Hana Pr šová Hana Pr šová Hana Pr šová (Gar.) | KZ | 2 | 2+0 | Z | PS |
| 16UJRF2 | Introductory Nuclear and Radiation Physics 2 Ladislav Musílek Ladislav Musílek (Gar.) | Z,ZK | 4 | 2P+2C | Z | PS |
| 02VOAF | Waves, Optics and Atomic Physics Josef Schmidt Jan Vysoký Ji í Tolar (Gar.) | Z,ZK | 6 | 4+2 | Z | PS |
| 16ZDOZ1 | Fundamentals of Radiation Dosimetry 1 Tomáš Trojek Tomáš Trojek (Gar.) | Z,ZK | 4 | 2+2 | | PS |
| 16ZDOZ2N | Fundamentals of Radiation Dosimetry 2 Tomáš Trojek Tomáš Trojek (Gar.) | Z,ZK | 4 | 2P+2C | L | PS |
| 16ZRIZ | Health risks of ionizing radiation Marie Davídková Marie Davídková (Gar.) | ZK | 2 | 2P+0C | L | PS |

Characteristics of the courses of this group of Study Plan: Code=BSPJIRZP2 Name=BS P_JIB RŽP 2nd year 01ANB3 Calculus B 3 1. Functional sequences and series - convergence range, criteria of uniform convergence, continuity, limit, differentiation and integration of functional series, power series, Series Expansion, Taylor's theorem. 2. Ordinary differential equations - equations of first order (method of integration factor, equation of Bernoulli, separation of variables, homogeneous equation and exact equation) and equations of higher order (fundamental system, reduction of order, variation of parameters, equations with constant coefficients and special right-hand side, Euler differential equation). 3. Metric spaces - metric, norm, scalar product, neighborhood, interior and exterior points, boundary point, isolated and non-isolated point, boundary of set, completeness of space, Hilbert spaces. Orthogonal polynomials. Complete orthogonal systems. 4. Fourier series - expansion of functions into Fourier series, trigonometric Fourier series and their convergence. 5. Differential calculus of functions of several variables - limit, continuity, partial and directional derivative, gradient, total derivatives and tangent plane, Taylor series, elementary terms of vector analysis, Jacobi matrix. 6. Functions defined implicitly by one or several equations. 01ANB4 Calculus B 4 [1] Diferenciální po et funkcí více prom nných a funkcionálních vektor . [2] Funkce zadané implicitn . [3] Taylorovy ady funkce více prom nných [4] Regulární zobrazení, zám na prom nných, nekartézské soustavy sou adnic. [5] Lokální, vázané a globální extrémy funkce více prom nných. [6] Základy teorie míry a obrys konstrukce Lebesgueovy míry. [7] Integrální po et funkce více prom nných - Riemann v a Lebesgue v integrál, základní vlastnosti, Fubiniova v ta, v ta o substituci. Leviho a Lebesgueova v ta. Limita, spojitost a derivace integrálu podle parametru. [8] Integrály po k ivkách a plochách. Integrální v ty. 12NME1 Numerical Methods 1 Z,ZK There are explained the basic principles of numerical mathematics important for numerical solving of problems important for physics and technology. Methods for solution of tasks very important for physicists (ordinary differential equations, random numbers) are included in addition to the basic numerical methods. Integrated computational environment MATLAB is used as a principle programming language as a demonstration tool. The seminars are held in computer laboratory. 16PNZ Problems of Non-ionizing Radiation ΚZ 2 Subject is focused on biological effects of non-ionizing radiation and its use in physical praxis. Information about principles, biological effects and methods used in fields of magnetic resonance and ultrasound as applied in various types of technical or medical equipment are given as well. 16PSE Topical Dosimetry Seminar 2 The seminary is supposed to motivate the students interest in the field of dosimetry and provide basic information about different applications of ionizing radiation in science, in research and in human life. The lectures are given by students and absolvents of DDAIR, who are currently employed at the department or in various organizations (SÚRO, v.v.i., ÚJF AV R v.v.i., ÚJV ež, MI, Hospital Na Homolce, FN v Motole, PTC Czech s.r.o., CERN, Fermilab). The lectures will focus not only on describing research and current topics in the field of dosimetry, but students will also learn more about Bachelor degree thesis topics and thus will learn more about their possible specialization during the studies and afterwards 18PMTL Programming in MATLAB K7 Introducing Matlab environment as efficient tool for computation in complex arrays and symbolic variables, namely for linear algebra, mathematic analysis, statistics, algorithmization and geometric representation of results. Introduction to Ecology 2 16ZIVB The subject inform about basic of the ecologic principles, terms and ideas. It covers overview information regarding to particular components of the environment and evaluate economic indicators and sustainable development. 16UJRF2 Introductory Nuclear and Radiation Physics 2 Z.ZK 4 The aim of the course is to provide students with basic knowledge about atomic nucleus and radiation physics, which is followed by other specialized lectures. The subject summarizes thematic areas: general properties of radioactive decay, alpha decay, proton radioactivity, beta decay, gamma emission, natural radioactivity, properties and types of nuclear reactions, nuclear fission, transuranium elements, thermonuclear reaction. Z.ZK 02VOAF Waves, Optics and Atomic Physics Wave phenomena in mechanics and electromagnetism: modes, standing and travelling waves, wave packets indispersive media. Wave optics: polarization, interference, diffraction, coherence. Geometrical optics. Introduction to quantum physics: black body radiation, quantum of energy, photoeffect, the Compton effect, the de Broglie waves, the Schrodinger equation, stationary states and spectra of finite systems. 16ZDOZ1 Fundamentals of Radiation Dosimetry 1 Z.ZK 4 History, development, and objectives of dosimetry. Quantities and units used for description of sources, fields, interactions of ionizing radiation, ionizations, energy transfer and absorption. Fundamentals of the effects of ionizing radiation. Fundamentals of Radiation Dosimetry 2 16ZDOZ2N Z.ZK Fundamentals of biological effects of ionizing radiation. Quantities and units used in radiation protection. Recommendations of ICRP and ICRU. Principles and methods of measurements in dosimetry. Determination of activity and neutron source emission. Measurements of absorbed dose and exposure. 2 16ZRIZ Health risks of ionizing radiation ZK The aim of the course is to acquaint students with the radiobiological basics of radiation protection. The basis of the course is an introduction to the biological effects of ionizing radiation (IR) at the molecular, cellular and tissue levels, an overview of deterministic and stochastic effects of ionizing radiation, health harm, risk and its evaluation, basics of epidemiology.

Code of the group: BSPJIRZP3

Name of the group: BS P JIB RŽP 3rd year

Requirement credits in the group:

Requirement courses in the group: In this group you have to complete at least 14 courses

Credits in the group: 0 Note on the group:

| Code | Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) | Completion | Credits | Scope | Semester | Role |
|---------|-------------------------------------------------------------------------------------------------------------------------------------|------------|---------|-------|----------|------|
| | Tutors, authors and guarantors (gar.) | | | | | |
| 17BPJI1 | Bachelor Thesis 1 Tomáš Trojek, Dušan Kobylka, Jan Rataj Jan Rataj (Gar.) | Z | 5 | 5ZP | | PS |
| 17BPJI2 | Bachelor Thesis 2 Tomáš Trojek, Dušan Kobylka, Jan Rataj Jan Rataj (Gar.) | Z | 10 | 10ZP | | PS |
| 16DETE | Detectors of Ionizing Radiation Petr Pr ša Petr Pr ša Petr Pr ša (Gar.) | ZK | 4 | 4+0 | 6 | PS |
| 16EXK | Excursion Lenka Thinová Lenka Thinová (Gar.) | Z | 2 | 1t | 2 | PS |
| 17JARE | Nuclear Reactors Tomáš Bílý Tomáš Bílý (Gar.) | ZK | 2 | 2 | L | PS |
| 16OSE | Professional Seminar Kate ina Pila ová Kate ina Pila ová (Gar.) | Z | 3 | 0P+4C | | PS |
| 16PADR | Practical Analysis of Data and Risks Kate ina Pila ová, Václav Št pán Václav Št pán (Gar.) | KZ | 4 | 1P+3C | Z | PS |
| 01PRST | Probability and Statistics Tomáš Hobza Tomáš Hobza (Gar.) | Z,ZK | 4 | 3+1 | Z | PS |
| 16UAZB | Principles of Ionizing-Radiation Applications Ladislav Musílek Kamil Augsten Ladislav Musílek (Gar.) | ZK | 2 | 2+0 | Z | PS |
| 16RAON | Radiation Protection Tomáš Trojek, Darina Trojková, Ji í H Ika, Ladislav Tomášek, Ji í Martin ík Ji í Martin ík Tomáš Trojek (Gar.) | ZK | 4 | 4+0 | Z | PS |
| 16RAZP | Radioactivity in the Environment Lenka Thinová Lenka Thinová Lenka Thinová (Gar.) | Z,ZK | 3 | 2P+1C | 2 | PS |
| 12UPF1 | Introduction to Computational Physics 1 Milan Kucha ík, Richard Liska Milan Kucha ík Milan Kucha ík (Gar.) | Z,ZK | 2 | 1P+1C | Z | PS |
| 12UPF2 | Introduction to Computational Physics 2 Milan Kucha ík, Richard Liska Milan Kucha ík Milan Kucha ík (Gar.) | Z,ZK | 2 | 1P+1C | L | PS |
| 16ZPRD | Elementary Labs Petr Pr ša, Pavel Novotný Petr Pr ša Pavel Novotný (Gar.) | KZ | 3 | 3L | | PS |

| 17BPJI1 | Bachelor Thesis 1 | Z | 5 |
| Student on the basis of theses assignment and under leading of a supervisor individually processes given topic during 2 semesters. The subject is given by self-reliant work on given topic. The work is continuously check by a supervisor.

| 17BPJI2 | Bachelor Thesis 2 | Z | 10 |
| Student on the basis of theses assignment and under leading of a supervisor individually processes given topic during 2 semesters. The subject is given by self-reliant work on given topic. The work is continuously check by a supervisor.

| 16DETE | Detectors of Ionizing Radiation | ZK | 4

Characteristics of the courses of this group of Study Plan: Code=BSPJIRZP3 Name=BS P_JIB RŽP 3rd year

Gas filled detectors (ionization chambers, proportional counters, Geiger-Müller counters, corona counters), organic and inorganic scintillation detectors, Cherenkov counters, evaluation of light by photomultiplier, parameters of PMT, semiconductor detectors, cryogenic detectors.

16EXK Excursion Z 2

Excursion in research institutes, laboratories and cooperative universities(CERN, JINR, TU Dresden,...) and modern research trends usig ionizing radiation.

17JARE Nuclear Reactors ZK 2

Introduction. World power issue. Previous evolution of power reactor. Nuclear fission reactors, fuel assemblies, active core, control systems, safety systems, containment. Classification of reactors into IV generations. Standard types of nuclear power reactors: concept, description, layout, previous evolution, world share, perspectives. Pressurized water reactors (PWR). Western-type PWR (Westinghouse, KWU, Framatom). VVER-type reactors, Temelin nuclear power plant. Boiling water reactors. Heavy water reactors, fast breeder reactors, high-temperature gas cooled reactors. Second nuclear era reactors of generation IV GIF and INPRO initiatives. Evaluation

high-temperature gas cooled reactors. Second nuclear era. reactors of generation III (EPR, AP-1000, VVER 1200). Reactors of generation IV: GIF and INPRO initiatives. Evaluation and selection of proposed systems. Six selected concepts. ICRP scenarios of word evolution, hydrogen power, role of nuclear power in long-term outlook

16OSE | Professional Seminar | Z | 3 In the first part of the seminar, students familiarize themselves with the general principles of publishing and presenting scientific work and the formal requirements for bachelors degree

projects at the faculty. The second part is designed as a practical training for the defence of the bachelors degree project. The students give oral presentations of the current state of the research results achieved during the work on their projects. Each presentation is followed by a discussion on scientific matters as well as on the possibilities of improving the students performance. Third part of the seminar deals with topical questions on nuclear and radiation physics, dosimetry, detectors of ionizing radiation, and radiation protection with focus on bachelor state final exams. Ph.D. students and academic staff lead this topical discussion with students about given questions and tries to help the students to accommodate learned knowledge form their studies in complex frame for application in practice.

16PADR Practical Analysis of Data and Risks KZ

The aim of the course is to provide students with a summary of basic theoretical knowledge, especially in the field of probability and statistics, useful for data and risk analysis. The main content of the course is practical application of theoretical procedures, especially data analysis using available software solution. Students will learn to perform comprehensive analysis and evaluation of data and risks.

01PRST Probability and Statistics Z,ZK 4

It is a basic course of probability theory and mathematical statistics. The probability theory is build gradually beginning with the classical definition and continuing till the Kolmogorov definition. The notions as random variable, distribution function of random variable and characteristics of random variable are treated and basic limit theorems are stated and proved. On the basis of this theory the basic methods of mathematical statistics such as estimation of distribution parameters and hypothesis testing are explained.

| 16UAZB | Principles of Ionizing-Radiation Applications | ZK | 2 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------------------------------|
| Historical outline of a | pplications, review of interaction of radiation with a matter, radiation sources, detectors and instrumentation, evaluation of radio | onuclide measuren | nents, use of |
| penetration and scatt | ering of radiation beams, selected radioanalytical methods, tracer methods, radionuclide dating, further possibilities for the use | e of ionizing radiation | on. |
| 16RAON | Radiation Protection | ZK | 4 |
| The course covers the | e basic principles of radiation protection. It describes not only the current approaches but also points to future developments. T | he course is accep | oted as training, |
| which allows obtainin | g special competence in radiation protection and learner receives appropriate certificate. | | |
| 16RAZP | Radioactivity in the Environment | Z,ZK | 3 |
| The course provides | comprehensive view of the source of ionizing radiation occurring in the environment. | | |
| | | | |
| 12UPF1 | Introduction to Computational Physics 1 | Z,ZK | 2 |
| | Introduction to Computational Physics 1 and its role in physics, methodology of writing computer codes. Computer languages for physics. Numerical libraries and progr | 1 ' 1 | 2 ysics. Computer |
| Numerical simulation | · · · | ram libraries for ph | |
| Numerical simulation tools for scientific visu | and its role in physics, methodology of writing computer codes. Computer languages for physics. Numerical libraries and progr | ram libraries for ph | |
| Numerical simulation tools for scientific visu | and its role in physics, methodology of writing computer codes. Computer languages for physics. Numerical libraries and progralization. Computational fluid dynamics, hydrodynamic simulations, methods for discretization of Euler equations. High-performa | ram libraries for ph | |
| Numerical simulation tools for scientific visu software for parallel s | and its role in physics, methodology of writing computer codes. Computer languages for physics. Numerical libraries and progralization. Computational fluid dynamics, hydrodynamic simulations, methods for discretization of Euler equations. High-performations. Databases of scientific information, scientist evaluation, citation analysis. | ram libraries for ph nce computing, pa | rallel computing, |
| Numerical simulation tools for scientific visu software for parallel s 12UPF2 Nonlinear models, co | and its role in physics, methodology of writing computer codes. Computer languages for physics. Numerical libraries and progralization. Computational fluid dynamics, hydrodynamic simulations, methods for discretization of Euler equations. High-performal mulations. Databases of scientific information, scientist evaluation, citation analysis. Introduction to Computational Physics 2 | ram libraries for ph nce computing, pa | rallel computing, |
| Numerical simulation tools for scientific visu software for parallel s 12UPF2 Nonlinear models, co | and its role in physics, methodology of writing computer codes. Computer languages for physics. Numerical libraries and progralization. Computational fluid dynamics, hydrodynamic simulations, methods for discretization of Euler equations. High-performal imulations. Databases of scientific information, scientist evaluation, citation analysis. Introduction to Computational Physics 2 Inplex systems, chaotic systems, fractals and their applications in physics. Artificial intelligence methods: neural networks, man | ram libraries for ph nce computing, pa | rallel computing, |
| Numerical simulation tools for scientific visus oftware for parallel standard standa | and its role in physics, methodology of writing computer codes. Computer languages for physics. Numerical libraries and progralization. Computational fluid dynamics, hydrodynamic simulations, methods for discretization of Euler equations. High-performations. Databases of scientific information, scientist evaluation, citation analysis. Introduction to Computational Physics 2 mplex systems, chaotic systems, fractals and their applications in physics. Artificial intelligence methods: neural networks, machini applications in physics. Quantum computing. Virtual reality. | Tam libraries for phance computing, pa | rallel computing, 2 setic algorithms, |
| Numerical simulation tools for scientific visus oftware for parallel statement of the software for software f | and its role in physics, methodology of writing computer codes. Computer languages for physics. Numerical libraries and progralization. Computational fluid dynamics, hydrodynamic simulations, methods for discretization of Euler equations. High-performation and programment in the computation of Euler equations. High-performation and programment in the computation of Euler equations. High-performation in the computation of Euler equations in the computation of Euler equations. High-performation in the computation of Euler equations in the computation of Euler equations. High-performation analysis. Introduction to Computational Physics 2 mplex systems, chaotic systems, fractals and their applications in physics. Artificial intelligence methods: neural networks, making applications in physics. Quantum computing. Virtual reality. Elementary Labs | Z,ZK chine learning, gen | 2 letic algorithms, 3 liation. Ionizing |

Name of the block: Compulsory elective courses

Minimal number of credits of the block: 0

The role of the block: PV

Code of the group: BSSPOLVEDY

Name of the group: BS - Social Sciences

Requirement credits in the group:

Requirement courses in the group: In this group you have to complete at least 1 course

Credits in the group: 0

Note on the group:

Only one of these courses is obligatory.

| riote on the gr | oup. | | | | | |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------|-------|----------|------|
| Code | Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.) | Completion | Credits | Scope | Semester | Role |
| 00EKOT | Economy in Technology Jana Ková ová | Z | 1 | 2+0 | | PV |
| 00ETV | Ethics of Science and Technology Jakub Hají ek Jana Ková ová | Z | 1 | 0+2 | L | PV |
| 00RET | Rhetoric Jana Ková ová Jana Ková ová Jana Ková ová (Gar.) | Z | 1 | 0+2 | | PV |
| 00UPRA | Introduction to Law Martin ech Jana Ková ová | Z | 1 | 0+2 | | PV |
| 00UPSY | Introduction to Psychology Jakub Hají ek Jana Ková ová | Z | 1 | 0+2 | | PV |

Characteristics of the courses of this group of Study Plan: Code=BSSPOLVEDY Name=BS - Social Sciences

| | the counces of the group of classy fram cous-200. C17125. Hame-20 Coolai colonicos | | |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------|----------------------|---------------|
| 00EKOT | Economy in Technology | Z | 1 |
| The course introduces to | he basics of micro- and macroeconomics. | | • |
| 00ETV | Ethics of Science and Technology | Z | 1 |
| 00RET | Rhetoric | Z | 1 |
| The course is focused of | n the acquisition of speech and voice techniques and on the rules of correct pronounciation. The course is also devoted to the | ne composition of | public speech |
| as well as to its nonvert | al aspects. Stylistics exercises, strategies for coping with stage-fright and a short excursion into the history of rhetoric are ar | integral part of the | ne course. |
| 00UPRA | Introduction to Law | Z | 1 |
| 00UPSY | Introduction to Psychology | Z | 1 |

Code of the group: BSPJAZYKYZK Name of the group: BS P languages Requirement credits in the group:

Requirement courses in the group: In this group you have to complete at least 2 courses

Credits in the group: 0 Note on the group:

| Code | Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.) | Completion | Credits | Scope | Semester | Role |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------|-------|----------|------|
| 04XAMZK | English for Intermediate Students Examination Jana Ková ová, Slav na Brownová Jana Ková ová | ZK | 4 | | Z | PV |
| 04XAPZK | English for Advanced Students Examination Slav na Brownová, Darren Copeland Jana Ková ová | ZK | 4 | | Z | PV |
| 04XCESZZK | Czech for Foreigners Beginners - Examination Slav na Brownová Jana Ková ová Jana Ková ová (Gar.) | ZK | 4 | | Z | PV |
| 04XCESMZK | Czech for Intermediate Students Examination Jana Ková ová Jana Ková ová (Gar.) | ZK | 4 | | Z | PV |
| 04XCESPZK | Czech for Foreign Students - Advanced Examination Jana Ková ová Jana Ková ová (Gar.) | ZK | 4 | | Z | PV |
| 04XFMZK | French for Intermediate Students Examination V ra Šlechtová V ra Šlechtová (Gar.) | ZK | 4 | | Z | PV |
| 04XFPZK | French for Advanced Students Examination V ra Šlechtová V ra Šlechtová V ra Šlechtová (Gar.) | ZK | 4 | | Z | PV |
| 04XFZZK | French for Beginners Examination V ra Šlechtová V ra Šlechtová V ra Šlechtová (Gar.) | ZK | 3 | | L | PV |
| 04XNMZK | German for Intermediate Students Examination Miloslava echová Miloslava echová Miloslava echová (Gar.) | ZK | 4 | | Z | PV |
| 04XNPZK | German for Advanced Students Examination Miloslava echová Miloslava echová Miloslava echová (Gar.) | ZK | 4 | | Z | PV |
| 04XRMZK | Russian for Intermediate Students Examination Zhanna Isaeva Zhanna Isaeva Zhanna Isaeva (Gar.) | ZK | 4 | | Z | PV |
| 04XRPZK | Russian for Advanced Students Examination Zhanna Isaeva Zhanna Isaeva Zhanna Isaeva (Gar.) | ZK | 4 | | Z | PV |
| 04XRZZK | Russian for Beginners Examination Zhanna Isaeva Zhanna Isaeva Zhanna Isaeva (Gar.) | ZK | 3 | | L | PV |
| 04XSMZK | Spanish for Intermediate Students Examination Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.) | ZK | 4 | | Z | PV |
| 04XSPZK | Spanish for Advanced Students Examination Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.) | ZK | 4 | | Z | PV |
| 04XSZZK | Spanish for Beginners Examination Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.) Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.) | ZK | 3 | | L | PV |

| 4XAMZK | English for Intermediate Students Examination | ZK | 4 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|---------------------------------|
| he course content is | the examination as given by the study plan. The examination covers the AM1, AM2, and AM3 courses and consists of tw | o parts - written (100 mi | n) and oral |
| 20-30 min). The stude | ent is expected to master the AM syllabus and demonstrate the ability to apply their knowledge gained in the three Englis | sh courses. | |
| 4XAPZK | English for Advanced Students Examination | ZK | 4 |
| he course content is | the examination as given by the study plan. The student is supposed to demonstrate mastering the AP3 syllabus and the $lpha$ | ability to apply their know | ledge obtain |
| the three AP course | s. The examination consists of 2 parts - written (100 min) and oral (30 min) and includes also oral presentation of a topic | from the student's field | of study. |
| 4XCESZZK | Czech for Foreigners Beginners - Examination | ZK | 4 |
| he course content is | the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of | the 04XCESZ1,2,3 cour | ses and can |
| nly be taken after su | ccessful completion of all three courses. Detailed information is to be obtained from the teacher. | | |
| 4XCESMZK | Czech for Intermediate Students Examination | ZK | 4 |
| he course content is | the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of | the CESM1,2,3 courses | and can only |
| e taken after succes | sful completion of the 3 courses. Detailed information is to be obtained from the teacher. | | |
| 4XCESPZK | Czech for Foreign Students - Advanced Examination | ZK | 4 |
| he course content is | the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of | the CESP1,2,3 courses | and can only |
| e taken after succes | sful completion of the 3 courses. Detailed information is to be obtained from the teacher. | | |
| 4XFMZK | French for Intermediate Students Examination | ZK | 4 |
| he content is the exa | mination as given by the study programme. The whole French programme is ended with an examination covering the cor | ntents of FM1-FM3. The | examination |
| onsists of a written a | nd oral part and is organized according to Examination Instructions, a document available on the web. | | |
| 4XFPZK | French for Advanced Students Examination | ZK | 4 |
| | gram is ended with an examination covering the contents of FP1-FP3. The examination consists of a written and/or an or | al part and is organized | according to |
| he whole French pro | | | |
| • | ns, a document available on the web. Assessment of the presentation is included into the examination grading. | | |
| xamination Instruction | | ZK | 3 |
| xamination Instruction | ns, a document available on the web. Assessment of the presentation is included into the examination grading. French for Beginners Examination mination as given by the study plan. The course is terminated with an examination consisting of oral and written part. The | | _ |
| xamination Instruction 4XFZZK the content is the example of the | French for Beginners Examination | | - |
| xamination Instruction 4XFZZK the content is the example that the exampl | French for Beginners Examination mination as given by the study plan. The course is terminated with an examination consisting of oral and written part. The | | _ |
| xamination Instruction 4XFZZK the content is the example of the | French for Beginners Examination mination as given by the study plan. The course is terminated with an examination consisting of oral and written part. The ation. Its content covers the levels FZ1 - FZ5. | e examination is ruled by | the docume |
| xamination Instruction 14XFZZK The content is the example is the | French for Beginners Examination mination as given by the study plan. The course is terminated with an examination consisting of oral and written part. The ation. Its content covers the levels FZ1 - FZ5. German for Intermediate Students Examination | e examination is ruled by ZK mination consisting of two | the docume 4 p parts - writing |
| xamination Instruction 4XFZZK the content is the examinatruction for examinatruction | French for Beginners Examination mination as given by the study plan. The course is terminated with an examination consisting of oral and written part. The ation. Its content covers the levels FZ1 - FZ5. German for Intermediate Students Examination the examination as given by the study plan. The whole German for Intermediate Students Course is completed by an example the courses NM1 - NM3. The oral part follows after passing the written part successfully and after obtaining the 04NM3 a | e examination is ruled by ZK mination consisting of two | the docume 4 p parts - writ |
| xamination Instruction 14XFZZK The content is the example is the | French for Beginners Examination mination as given by the study plan. The course is terminated with an examination consisting of oral and written part. The ation. Its content covers the levels FZ1 - FZ5. German for Intermediate Students Examination the examination as given by the study plan. The whole German for Intermediate Students Course is completed by an example the courses NM1 - NM3. The oral part follows after passing the written part successfully and after obtaining the 04NM3 a | e examination is ruled by ZK mination consisting of two | the docume 4 p parts - writ |

| 04XRMZK | Russian for Intermediate Students Examination | ZK | 4 |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------|----------------------|-------------------|
| The course content | s the examination as given by the study plan. The course is completed by taking a written and oral examination testing the kno | wledge and skills a | cquired in RM1 |
| - RM3. Students are | eligible for the oral examination only after a prior pass in RM3 and a successful written examination. Students are given instru | ctions by the teache | er. |
| 04XRPZK | Russian for Advanced Students Examination | ZK | 4 |
| The course content | s the examination as given by the study plan. The course is completed by taking a written and oral examination testing the kno | wledge and skills a | cquired in RP1 |
| - RP3. Students are | eligible for the oral examination only after a prior pass in RP3 and a successful written examination. Students are given instruc | tions by the teache | r. |
| 04XRZZK | Russian for Beginners Examination | ZK | 3 |
| The course content | s the examination as given by the study plan. The course is completed by taking a written and oral examination testing the kno | wledge and skills a | cquired in RZ1 |
| - RZ5. Students are | eligible for the oral examination only after a prior pass in RZ5 and a successful written examination. Students are given instruct | ions by the teacher | : |
| 04XSMZK | Spanish for Intermediate Students Examination | ZK | 4 |
| The course content i | s the examination as given by the study plan. SMZK examination consists of two parts - written and oral; to be eligible for the writt | en part, students w | ill have obtained |
| non-graded assessr | ent for course SM3.Oral examination follows the written part. | | |
| 04XSPZK | Spanish for Advanced Students Examination | ZK | 4 |
| The course content | s the examination as given by the study plan. Examination SPZK consists of two parts, namely oral and written. The prerequisite | for admission to or | al part is having |
| passed the written to | st. Examination content is based on syllabi of courses SP1, SP2, and SP3 or on an individual study plan of the student. | | |
| 04XSZZK | Spanish for Beginners Examination | ZK | 3 |
| The course content | s the examination as given by the study plan. Examination consists of two parts - written and oral. Student can register for oral | examination only if | he/she has |
| passed the written e | xamination test. | | |

Name of the block: Elective courses Minimal number of credits of the block: 0

The role of the block: V

Code of the group: BSPJIRZPV

Name of the group: BS P_JIB RŽP Optional courses

Requirement credits in the group: Requirement courses in the group:

Credits in the group: 0 Note on the group:

| Code | Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) | Completion | Credits | Scope | Semester | Role |
|---------|---------------------------------------------------------------------------------------------------------------------|------------|---------|-------|----------|------|
| | Tutors, authors and guarantors (gar.) | | | | | |
| 17BPROV | Safe operation of nuclear facilities Lenka Frýbortová, ubomír Sklenka Lenka Frýbortová (Gar.) | KZ | 2 | 2P | | V |
| 02DEF2 | History of Physics 2 Igor Jex Igor Jex (Gar.) | Z | 2 | 2+0 | L | V |
| 16EPAM | Exact Methods in Research of Historic Monuments Ladislav Musílek Ladislav Musílek Ladislav Musílek (Gar.) | ZK | 2 | 2+0 | Z | V |
| 17ENEF | Experimental Neutron Physics Jan Rataj Jan Rataj (Gar.) | KZ | 3 | 1P+2L | L | ٧ |
| 16KPR | Clinical Propaedeutic Jana Votrubová Jana Votrubová (Gar.) | ZK | 2 | 2+0 | Z | V |
| 04AKS | English Conversation Jana Ková ová Jana Ková ová (Gar.) | Z | 1 | 0+2 | L | V |
| 00MAM1 | Essentials of High School Course 1 David Be | Z | 1 | 0+1 | | V |
| 00MAM2 | Essentials of High School Math Course 2 Lukáš Heriban Severin Pošta Lukáš Heriban (Gar.) | Z | 1 | 0+1 | | V |
| 01NME2 | Numerical Methods 2 Michal Beneš Michal Beneš (Gar.) | KZ | 2 | 2+0 | L | V |
| 15CH1 | General Chemistry 1 Ond ej Holas, Petr Distler, Václav uba Petr Distler Petr Distler (Gar.) | Z | 3 | 2+1 | Z | V |
| 15CH2 | General Chemistry 2 Ond ej Holas, Petr Distler, Václav uba Petr Distler Petr Distler (Gar.) | Z,ZK | 3 | 2+1 | L | V |
| 18PRC1 | Programming in C++ 1 Vladimír Jarý, Miroslav Virius Miroslav Virius (Gar.) | Z | 4 | 2+2 | Z | V |
| 18PRC2 | Programming in C++ 2 Vladimír Jarý, Miroslav Virius, Jakub Klinkovský Miroslav Virius Miroslav Virius (Gar.) | KZ | 4 | 2+2 | L | V |
| 01PSL | LaTeX - Publication Instrument Petr Ambrož Petr Ambrož (Gar.) | Z | 2 | 0+2 | L | V |
| 01RMAF | Equations of Mathematical Physics Václav Klika Václav Klika (Gar.) | Z,ZK | 7 | 4P+2C | | V |
| 01STME | Statistical Methods with Applications Tomáš Hobza Tomáš Hobza Tomáš Hobza (Gar.) | ZK | 2 | 2P+0C | | V |
| TV-1 | Physical Education | Z | 1 | | Z | V |
| TV-2 | Physical Education | Z | 1 | | L | V |
| TV-3 | Physical education | Z | 1 | 0+2 | Z | V |

| TV-4 | Physical education | Z | 1 | 0+2 | L | V |
|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------|---------------------|-------------|----------------------|
| 02TEF1 | Theoretical Physics 1 | Z,ZK | 4 | 2+2 | Z | V |
| 02TSFA | Petr Novotný Michal Jex Igor Jex (Gar.) Thermodynamics and Statistical Physics | Z,ZK | 4 | 2+2 | L | V |
| | Igor Jex, Jaroslav Novotný Antonín Hoskovec Igor Jex (Gar.) Introduction to Elementary Particle Physics | | | | _ | |
| 02UFEC | Marek Matas, Jaroslav Biel ík Jaroslav Biel ík Jaroslav Biel ík (Gar.) | Z | 2 | 2+0 | Z | V |
| 17UING | Introduction to Engineering Jan Frýbort, Petr Haušild, Radek Mušálek Jan Frýbort (Gar.) | KZ | 3 | 2P+1C | Z | V |
| 12UNXAP | Introduction to UNIX Milan Kucha ík Milan Kucha ík (Gar.) | Z | 2 | 1P+1C | L | V |
| 12UVP | Introduction to Scientific Computing Milan Ši or Milan Ši or Milan Ši or (Gar.) | Z | 2 | 1P+1C | L | V |
| 16UVJZ | Introduction to Decommissioning of Nuclear Facilities Lenka Thinová, Tomáš Trojek Lenka Thinová Lenka Thinová (Gar.) | Z,ZK | 4 | 3P+1C | L | V |
| 18ZALG | Basics of Algorithmization Vladimír Jarý, Miroslav Virius, Petr Pauš, František Vold ich, Jan Tomsa, Zuzana Pet í ková, František Gašpar Vladimír Jarý Miroslav Virius (Gar.) | Z,ZK | 4 | 2+2 | L | V |
| 12ZEL1 | Basic Electronics 1 Jaroslav Pavel Jaroslav Pavel (Gar.) | Z,ZK | 3 | 2+1 | Z | V |
| 12ZEL2 | Basic Electronics 2 Jaroslav Pavel Jaroslav Pavel (Gar.) | Z,ZK | 3 | 2+1 | L | V |
| 16ZPSP | Basic Work with PC | Z | 2 | 0+2 | 1 | V |
| 16ZRAO | Kamil Augsten Kamil Augsten (Gar.) Basics of Radiation Protection | Z | 2 | 2+0 | | V |
| | Aneta Smejkalová Aneta Smejkalová Aneta Smejkalová (Gar.) Sources of Irradiation and Environment | | | | _ | |
| 16ZOZ | Ladislav Musílek, Ond ej Ko istka, Lenka Thinová, Václav Št pán, Tomáš Urban, Tomáš echák Václav Št pán Václav Št pán (Gar.) | KZ | 4 | 2P+2C | L | V |
| Characteristics of t | he courses of this group of Study Plan: Code=BSPJIRZPV Name | =BS P_JIB R | ŽP Opti | onal cour | ses | |
| 17BPROV S | Safe operation of nuclear facilities | | - | | KZ | 2 |
| | o familiarize students with basic principles of nuclear safety. History of Physics 2 | | | | 7 | 2 |
| - | mechanics after Newton, Bernoulli's, Euler, Lagrange. Historical development of optics, | corpuscular and w | ave approa | ا ch. Electricit | _ | - |
| • | electrodynamics and electromagnetism, Faraday and Maxwell. Thermodynamics and its | • | | | - | |
| | anck and Einstein. Discovery of radioaktivity, structure of atom, atomic nucleus, Rutherfo | • | | | | • |
| | pept of Nature and Universe of today. | | ., | 37, | , , | , |
| 16EPAM E | Exact Methods in Research of Historic Monuments | | | | ZK | 2 |
| | ric monument investigations, methods of age determination (radiocarbon, thermoluminesce | nce and related me | thods, furth | I | | drochronology, |
| archaeomagnetism), anal | ytical methods for determination of origin and production technologies of artefacts (activ | ation analysis, X-r | ay fluoresce | ence analysis | s and other | methods), |
| photogrammetry. | | | | | | |
| 17ENEF E | Experimental Neutron Physics | | | | KZ | 3 |
| The course is focused on | experimental methods and experiments in the field of neutron physics, mainly using radio | onuclide neutron s | ources. The | | | the theoretical |
| | aration and realization of the laboratory exercises and to the methods of experimental data | | | | | |
| description of neutron pro | perties and their utilization, the characteristics of neutron sources, properties of prompt a | nd delayed neutro | ns, selected | l methods of | neutron det | ection, neutron |
| | production, formation and modification of neutron fields and neutron beams. The lectures | • | = | - | | |
| | of delayed neutrons, study of neutron transport in various substances, experiments with | | , | | • | |
| | of photo-neutron source, calibration of the radionuclide neutron source. The experiment | s are realized at tr | ne vR-1 trai | | | |
| | Clinical Propaedeutic vith the basics of anamnesis, physical examination, examinational methods of different or | gans homatologic | sal and biog | | ZK | 2 |
| | English Conversation | garis, riematologic | cai ai lu bioc | TIETTICAI EXAI | Z | 1 |
| | ne student's communication skills acquired throughout their previous studies. It aims to in | mprove all aspects | of oral con | ا nmunication. | ı | t will develop |
| · | s communication situations and will master their communication strategy. They will also | | | | | |
| in discussions. The studer | nt will be trained to express their ideas clearly and according to current English usage, a | nd become a more | e confident | speaker. | | |
| | Essentials of High School Course 1 | | | | Z | 1 |
| | o mathematical concepts and methods used in the introductory physics course. | | | 1 | | |
| 00MAM2 Eview of basics of high s | Essentials of High School Math Course 2 school mathematics. | | | | Z | 1 |
| | Numerical Methods 2 | | | ı | KZ | 2 |
| | umerical solution of boundary-value problems and intial-boundary-value problems for ord to initial-value problems and finite-difference methods for elliptic, parabolic and first-ord | | | - | plains meth | ods converting |
| | to initial-value problems and limite-difference methods for elliptic, parabolic and first-ordi Seneral Chemistry 1 | or hyperbolic parti | ai uiiititiili | ar Equations. | Z | 3 |
| The most important conce | persection Crieffistry 1 opts, quantities and units used in chemistry are introduced in the course General Chemis | stry I. Their signific | ance and p | ractical use | _ | _ |
| solved in exercises. | Conoral Chomistry 2 | | | - I | 771/ | 2 |
| | General Chemistry 2 ation of the course General chemistry I. The main attention is paid to general principles o | noverning chamics | al nrocesso | | Z,ZK | 3 s the fact that |
| = | ples is not restricted only to chemical processes is documented. The significance and pr | - | - | _ | - | |
| in exercises. | , 2000 and μεταθού το ασσαποτικού. The digninounce and μεταθού του συστικού του συστικού από μεταθού του | | 50 Pillio | , aro muc | | |
| | Programming in C++ 1 | | | | Z | 4 |
| | the C programming language and non-object oriented features of the C++ language. | | | | | |
| | Programming in C++ 2 | | | | KZ | 4 |
| This course covers the ob | ject oriented programming and othesr advanced constructs in the C+;+ programming la | nguage and the St | andard Ten | nplate Librar | у. | |
| | | | | | | |

| 01PSL | LaTeX - Publication Instrument | Z | 2 |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------|
| | to the basics and facilities of computer typography, particularly to the system LaTeX | . – I | _ |
| 01RMAF | Equations of Mathematical Physics | Z,ZK | 7 |
| - | se is solving integral equations, theory of generalized functions, classification of partial differential equations, theory of integr | | , and solution of |
| | tions (boundary value problem for eliptic PDE, mixed boundary problem for eliptic PDE). | | |
| 01STME | Statistical Methods with Applications | ZK | 2 |
| | selected methods of statistical data analysis such as: linear regression and correlation, analysis of variance, nonparametric r | | |
| | m is to illustrate the use of statistical procedures on examples. Solutions of concrete examples by use of statistical software a | - | |
| TV-1 | Physical Education | Z | 1 |
| TV-2 | Physical Education | Z | 1 |
| TV-3 | Physical education | Z | 1 |
| TV-4 | Physical education | Z | 1 |
| 02TEF1 | Theoretical Physics 1 | Z,ZK | 4 |
| 1 | Theoretical Physics 1 action to analytical mechanics. The students acquire knowledge of the basic concepts of the Lagrange and Hamiltonian formalis | | • |
| | ics (Newtons, Lagrange, Hamilton and Hamilton-Jacobi equations). The efficiency of these methods is illustrated on elementa | | |
| | a system of constrained mass points, and of a rigid body. Advanced parts of the course cover differential and integral principle | | |
| 1. | rse of classical theoretical physics (02TEF1, 02TEF2). | | |
| 02TSFA | Thermodynamics and Statistical Physics | Z,ZK | 4 |
| | namics and statistical physics. Thermodynamic potential, the Joule Thomson effect, conditions of equilibrium, the Braun-Le Cha | | - |
| 1 | escriptionfrom a statistical point of view (classical and quasiclassical regime within the frame of a canonical and grand-canon | | |
| 1 | k body radiation). The Boltzmann equation is usedto discusses simple transport phenomena. | • | , |
| 02UFEC | Introduction to Elementary Particle Physics | Z | 2 |
| 1 | n easily accessible introduction to elementary particle physics. Development, methods, goals and perspectives of the subject | are presented. | |
| 17UING | Introduction to Engineering | KZ | 3 |
| | troduction to engineering skills. Students should gain general engineering skills at basic level (e.g. material properties and be | | manufacturing |
| | assurance, environmental impacts,). In addition, the introduction to scientific work and technical drawing will be included. | | |
| 12UNXAP | Introduction to UNIX | Z | 2 |
| 1 | g systems. Personal computer, workstation and supercomputers. Processor, memory, bus, devices, hard disk, network interfa | ice. Hardware and | |
| Principles of operating | systems. Operating system UNIX. Basic principles, kernel, kernel services. Documentation. File system, file atributes, working | g with files. Text ec | ditors: vi, emacs. |
| Command interpreter (s | shell) bash and its programming (scripts). Controlling processes, process status, computer load a process priorities. Standarc | ł tools. Graphical ւ | user interface |
| X-windows. Computer r | networks. Local computer networks. Global computer networks. Addresses and protocols TCP/IP. Network configutation of a c | omputer. Network | services: |
| hardware sharing, mail, | , scp, etc. Network applications | | |
| 12UVP | Introduction to Scientific Computing | Z | 2 |
| Practically oriented Intro | oduction to scientific computing. Constituent part of the course is realized in computer classroom.Students get acquinted with | some basic tools | fort scientific |
| and technicval computing | ng, data analysis, data visualisation and algorithm development. | | |
| 16UVJZ | Introduction to Decommissioning of Nuclear Facilities | Z,ZK | 4 |
| The course aims to fam | iliarise students with the actual decommissioning process. The syllabus of the subject is built in the sense of the actual course | of the preparation | n and realization |
| of the decommissioning | g project. It includes implementation of site decommissioning including legislative requirements to protect employees and the | environment agair | nst radiation and |
| | heir categorization, transport, release to the environment and disposal. It deals with documentation and centralization of mor | itoring systems. | |
| 18ZALG | Basics of Algorithmization | Z,ZK | 4 |
| | to selected algorithms and methods for algorithm design. This course intruduces selected methods for the determination of the | ne algorithm comp | lexity. |
| 12ZEL1 | Basic Electronics 1 | Z,ZK | 3 |
| 1 | rimary knowledge of circuit theory concerning principles of electronic circuits in both stationary and harmonic stable state. Cir | = | |
| | c and complex method are explained. Proper circuit analysis is also lectured. The subject's final part deals with transient effect. | ts inside linear cir | |
| 12ZEL2 | Basic Electronics 2 | Z,ZK | 3 |
| The subject follows up | with the Basic Electronics 1. Semiconductor elements basic properties are explained. Thecourse's final part deals with basic | themes of logical | circuits field. |
| 16ZPSP | Basic Work with PC | Z | 2 |
| The aim of the course is | s to acquaint students with the basic skills related to working on a personal computer. The introductory part of the course is do | evoted to informati | ion systems and |
| | he CTU in Prague and the FNSPE. Emphasis is placed on effective handling of work with office productivity software (text edi | · · | • |
| 1 | s in MS Office. The practical content focuses mainly on further use during studies (laboratory reports, research work, bachelo | • | |
| 1 | als, state administration, companies). Other sections summarize basic information about computer hardware, software, and sections summarize basic information about computer hardware, software, and sections summarize basic information about computer hardware, software, and sections summarize basic information about computer hardware, software, and sections summarize basic information about computer hardware, software, and sections summarize basic information about computer hardware, software, and sections summarize basic information about computer hardware, software, and sections summarize basic information about computer hardware, software, and sections summarize basic information about computer hardware, software, and sections summarize basic information about computer hardware, software, and sections such as the section of the secti | curity. Completion | n of independent |
| <u> </u> | rticipation in exercises above 60% is a necessary condition for passing the course. | | |
| 16ZRAO | Basics of Radiation Protection | Z | 2 |
| | s to familiarize students with the general principles of radiation protection. The main emphasis is put on basic mechanisms and | = | |
| | The course provides answers to the cardinal questions: What is ionizing radiation (IR), where it comes from, whether and how | _ | |
| | ctive units (Gray, Sievert), how to prevent malicious effect of IR and many others. The content of the lectures does not require | | |
| 16ZOZ | Sources of Irradiation and Environment | KZ | 4 |
| 1 ' ' | n overview of the usage of ionizing radiation from its discovery and first applications to modern methods. It allows the student | - | - 1 |
| _ | usage. The subject deals with the fundamental issues related to ionizing radiation and the safety of dealing with the sources of the data and subsequent preparation of the results. | TIIX. THE COURSE IF | icidues practical |

Code of the group: BSPJAZYKYZAP Name of the group: BS P jazyky zap Requirement credits in the group: Requirement courses in the group: Credits in the group: 0

Note on the group:

| Code | Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.) | Completion | Credits | Scope | Semester | Role |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------|-------|----------|------|
| 04XAM1 | English for Intermediate Students M1 | Z | 2 | 0+2 | Z | V |
| 04XAM2 | English for Intermediate Students M2 Jana Ková ová | Z | 2 | 0+2 | L | V |
| 04XAM3 | English for Intermediate Students M3 Jana Ková ová | Z | 2 | 0+2 | Z | V |
| 04XAP1 | English for Advanced Students P1 Jana Ková ová | Z | 2 | 0+2 | Z | V |
| 04XAP2 | English for Advanced Students P2 Jana Ková ová | Z | 2 | 0+2 | L | V |
| 04XAP3 | English for Advanced Students P3 Jana Ková ová | Z | 2 | 0+2 | Z | V |
| 04XCESZ1 | Czech for Foreigners - Beginners 1 Jana Ková ová Jana Ková ová (Gar.) | Z | 2 | 0+2 | Z | V |
| 04XCESZ2 | Czech for Foreigners - Beginners 2 Jana Ková ová Jana Ková ová (Gar.) | Z | 2 | 0+2 | L | V |
| 04XCESZ3 | Czech for Foreigners - Beginners 3 Jana Ková ová Jana Ková ová (Gar.) | Z | 2 | 2S | Z | V |
| 04XCESM1 | Czech for Foreigners - Intermediate 1 Jana Ková ová Jana Ková ová (Gar.) | Z | 2 | 0+2 | Z | V |
| 04XCESM2 | Czech for Foreigners - Intermediate 2 Jana Ková ová Jana Ková ová (Gar.) | Z | 2 | 0+2 | L | V |
| 04XCESM3 | Czech for Foreigners - Intermediate 3 Jana Ková ová Jana Ková ová (Gar.) | Z | 2 | 0+2 | Z | V |
| 04XCESP1 | Czech for Foreign Students - Advanced 1 Jana Ková ová Jana Ková ová (Gar.) | Z | 2 | 0+2 | Z | V |
| 04XCESP2 | Czech for Foreigners - Advanced 2 Jana Ková ová Jana Ková ová (Gar.) | Z | 2 | 0+2 | L | V |
| 04XCESP3 | Czech for Foreigners - Advanced 3 Jana Ková ová Jana Ková ová (Gar.) | Z | 2 | 0+2 | Z | V |
| 04XFM1 | French for Intermediate Students M1 V ra Šlechtová V ra Šlechtová (Gar.) | Z | 2 | 0+2 | Z | V |
| 04XFM2 | French for Intermediate Students M2 V ra Šlechtová V ra Šlechtová (Gar.) | Z | 2 | 0+2 | L | V |
| 04XFM3 | French for Intermediate Students M3 V ra Šlechtová V ra Šlechtová (Gar.) | Z | 2 | 0+2 | Z | V |
| 04XFP1 | French for Advanced Students P1 V ra Šlechtová V ra Šlechtová (Gar.) | Z | 2 | 0+2 | Z | V |
| 04XFP2 | French for Advanced Students P2 V ra Šlechtová V ra Šlechtová (Gar.) | Z | 2 | 0+2 | L | V |
| 04XFP3 | French for Advanded Students P3 V ra Šlechtová V ra Šlechtová (Gar.) | Z | 2 | 0+2 | Z | V |
| 04XFZ1 | French for Beginners Z1 V ra Šlechtová V ra Šlechtová (Gar.) | Z | 2 | 0+4 | L | V |
| 04XFZ2 | French for Beginners Z2 V ra Šlechtová V ra Šlechtová (Gar.) | Z | 2 | 0+4 | Z | V |
| 04XFZ3 | French for Beginners Z3 V ra Šlechtová V ra Šlechtová (Gar.) | Z | 2 | 0+4 | L | V |
| 04XFZ4 | French for Beginners Z4 V ra Šlechtová V ra Šlechtová (Gar.) | Z | 2 | 0+4 | Z | V |
| 04XFZ5 | French for Beginners Z5 V ra Šlechtová V ra Šlechtová (Gar.) | Z | 2 | 0+4 | L | V |
| 04XNM2 | German for Intermediate Students M2 Miloslava echová Miloslava echová (Gar.) | Z | 2 | 0+2 | L | V |
| 04XNM1 | German for Intermediate Students M1 Miloslava echová Miloslava echová (Gar.) | Z | 2 | 0+2 | Z | V |
| 04XNM3 | German for Intermediate Students M3 Miloslava echová Miloslava echová (Gar.) | Z | 2 | 0+2 | Z | V |
| 04XNP1 | German for Advanced Students P1 Miloslava echová Miloslava echová (Gar.) | Z | 2 | 0+2 | Z | V |
| 04XNP2 | German for Advanced Students P2 Miloslava echová Miloslava echová (Gar.) | Z | 2 | 0+2 | L | V |
| 04XNP3 | German for Advanced Students P3 Miloslava echová Miloslava echová (Gar.) | Z | 2 | 0+2 | Z | V |
| 04XRM1 | Russian for Intermediate Students M1 Zhanna Isaeva Zhanna Isaeva (Gar.) | Z | 2 | 0+2 | Z | V |
| 04XRM2 | Russian for Intermediate Students M2 Zhanna Isaeva Zhanna Isaeva (Gar.) | Z | 2 | 0+2 | L | V |
| 04XRM3 | Russian for Intermediate Students M3 Zhanna Isaeva Zhanna Isaeva (Gar.) | Z | 2 | 0+2 | Z | V |
| 04XRP1 | Russian for Advanced Students P1 Zhanna Isaeva Zhanna Isaeva (Gar.) | Z | 2 | 0+2 | Z | V |

| 04XRP2 | Russian for Advanced Students P2 Zhanna Isaeva Zhanna Isaeva (Gar.) | Z | 2 | 0+2 | L | V |
|--------|----------------------------------------------------------------------------------------------|---|---|-----|---|---|
| 04XRP3 | Russian for Advanced Students P3 Zhanna Isaeva Zhanna Isaeva (Gar.) | Z | 2 | 0+2 | Z | V |
| 04XRZ1 | Russian for Beginners Z1 Zhanna Isaeva Zhanna Isaeva (Gar.) | Z | 2 | 0+4 | L | V |
| 04XRZ2 | Russian for Beginners Z2 Zhanna Isaeva Zhanna Isaeva (Gar.) | Z | 2 | 0+4 | Z | V |
| 04XRZ3 | Russian for Beginners Z3 Zhanna Isaeva Zhanna Isaeva (Gar.) | Z | 2 | 0+4 | L | V |
| 04XRZ4 | Russian for Beginners Z4 Zhanna Isaeva Zhanna Isaeva (Gar.) | Z | 2 | 0+4 | Z | V |
| 04XRZ5 | Russian for Beginners Z5 Zhanna Isaeva Zhanna Isaeva (Gar.) | Z | 2 | 0+4 | L | V |
| 04XSM1 | Spanish for Intermediate Students M1 Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.) | Z | 2 | 0+2 | Z | V |
| 04XSM2 | Spanish for Intermediate Students M3 Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.) | Z | 2 | 0+2 | L | V |
| 04XSM3 | Spanish for Intermediate Students M3 Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.) | Z | 2 | 0+2 | Z | V |
| 04XSP1 | Spanish for Advanced Students P1 Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.) | Z | 2 | 0+2 | Z | V |
| 04XSP2 | Spanish for Advanced Students P2 Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.) | Z | 2 | 0+2 | L | V |
| 04XSP3 | Spanish for Advanced Students P3 Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.) | Z | 2 | 0+2 | Z | V |
| 04XSZ1 | Spanish for Beginners Z1 Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.) | Z | 2 | 0+4 | L | V |
| 04XSZ2 | Spanish for Beginners Students Z2 Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.) | Z | 2 | 0+4 | Z | V |
| 04XSZ3 | Spanish for Beginners Z3 Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.) | Z | 2 | 0+4 | L | V |
| 04XSZ4 | Spanish for Beginners Z4 Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.) | Z | 2 | 0+4 | Z | ٧ |
| 04XSZ5 | Spanish for Beginners Z5 Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.) | Z | 2 | 0+4 | L | V |

| 0 17.62 1 | Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.) | _ | _ | 011 | _ | ' |
|--------------------------------|-----------------------------------------------------------------------------------------------|-----------------------|-----------------|----------------|----------------|------------------|
| 04XSZ5 | Spanish for Beginners Z5 Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.) | Z | 2 | 0+4 | L | V |
| Characteristics of the | courses of this group of Study Plan: Code=BSPJAZYKYZAP N | Name=BS P ja | azyky zap |) | | |
| 04XAM1 En | glish for Intermediate Students M1 | | | | Z | 2 |
| The course is designed for s | tudents who have successfully completed the full secondary school English language of | course at least at | the A2 level of | of the Com | mon Europe | an Framework |
| of Reference for Languages | (CEFR). It provides an introduction into English for Specific and Academic Purposes (I | ESP, EAP), i.e., in | ito fundamen | itals of voca | abulary and | style typical of |
| professional oral and written | communication situations. Thus it covers topics related to the student's life and needs | as well as topics | of subtechni | cal interest | . Attention is | s also paid to |
| extending the knowledge of | grammar issues used in EAP. | | | | | |
| 04XAM2 En | glish for Intermediate Students M2 | | | | Z | 2 |
| The AM2 course expects the | e student to have completed the AM1 course. It develops their skills for work with subte | chnical texts, focu | using also mo | ore on spec | ific gramma | r, functions, |
| and lexical items typical of E | SP and EAP (e.g., definition, existence and classification of phenomena, object descripti | ons). Part of the c | ourse is also | guided writ | ing. If neces | sary, grammar |
| revision is included. | | | | | | |
| 04XAM3 En | glish for Intermediate Students M3 | | | | Z | 2 |
| The course develops the skil | Is that enable students to cope with features typical of professional style. Increasing atter | ntion is paid to dev | veloping subt | echnical vo | cabulary an | d independent |
| understanding of profession | al texts. Great emphasis is placed on distinguishing different levels of formal and inform | nal oral and writte | n communica | ation and th | eir appropri | ate Czech |
| | includes studying abstracts and rules for writing them as well as basic rules for prepar | ing and giving a s | short present | ation on a | chosen topi | related to the |
| student's field. | | | | | | |
| 04XAP1 En | glish for Advanced Students P1 | | | | Z | 2 |
| _ | students who have successfully completed the full secondary school English language | | | | | |
| | - CEFR). It provides an introduction into English for Specific and Academic Purposes (| | | | • | |
| | f professional oral and written communication situations (fundamentals of terms in mat | | | | • | |
| | written communication on topics related to the undergraduate's life and needs. It develop | s skills for free pro | ofessional wr | iting (writing | g a CV, lette | of application, |
| | revision of selected grammar topics is included. | | | | | |
| | glish for Advanced Students P2 | | | | Z | 2 |
| | AP1, thus extending the student's skills for working with subtechnical texts, and even | • | | | | • |
| | entrates on chosen grammar topics, but mainly intends to develop understanding of syn | | | | , , | |
| | ble, a case study). Increasing emphasis is placed on the undergraduate's independent | | | • | | • |
| | lent's subtechnical vocabulary, and includes fundamental notions of chosen branches of | of science. It is foo | used on forn | nal writing i | ncluding the | sentence and |
| | cohesion and coherence in texts. | | | | | |
| | glish for Advanced Students P3 | | | | Z | 2 |
| | AP2 and expects the student to work without any guidance with authentic professional r | | • | | • | |
| | nctions (e.g., expressing an opinion, agreement, and objections; taking part in discussion | | • | • | , | |
| | a given or chosen topic and presenting it. The course places emphasis on distinguishing | g levels of formal | and informal | language i | ootn in orai | and written |
| communication. | | | | | _ | |
| | ech for Foreigners - Beginners 1 | | | 1. | Z | 2 |
| _ | students of the English programme. Students will become acquainted with the main cha | | | • | | |
| | speaking skills. The course focuses on pronunciation exercises, simple social phrases, | and oral and writ | ten commun | cation in th | ie most com | imon everyday |
| i situations. The course cover | s roughly lessons 1-3 of estina Express (Czech Express) by L. Holá and P. Bo ilová. | | | | | |

| 04XCESZ2 Czech for Foreigners - Beginners 2 The language and communication competences acquired in CESZ1 are further developed. Students deepen their knowledge of the declension and or communication competences acquired in CESZ1 are further developed. | Z conjugation syste | 2 m and practise |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|------------------------|
| basic communication topics. The course covers roughly lessons 3-5 in Czech Express by L. Holá and P. Bo ilová. | ,g | |
| 04XCESZ3 Czech for Foreigners - Beginners 3 | Z | 2 |
| The course further develops the language and communication competences acquired in the XCESZ1 and XCESZ2 courses. The teaching focuses of fixing correct pronunciation and deepening grammar, features through practice, as well as introducing the Czech culture. Students are asked to produce the course fixing correct pronunciation and deepening grammar, features through practice, as well as introducing the Czech culture. Students are asked to produce the course fixing correct pronunciation and deepening grammar, features through practice, as well as introducing the Czech culture. | | |
| frequent types of dialogue. They also practise understanding texts in terms of main ideas or looking for specific details in texts. The course covers rough | | |
| 1. | | |
| 04XCESM1 Czech for Foreigners - Intermediate 1 | Z | 2 |
| The course is focused on correct pronunciation, important morphological phenomena, prepositional phrases, and verb forms as well as on extending th social situations. | ie student's vocab | oulary for various |
| 04XCESM2 Czech for Foreigners - Intermediate 2 | Z | 2 |
| The course develops the topics covered in CESM1 and is then focused on more difficult grammar phenomena. It practices writing, speaking, and rea | ı | |
| in understanding common abbreviations, abbreviated words, and mathematical terms and formulas. | | |
| 04XCESM3 Czech for Foreigners - Intermediate 3 | Z | 2 |
| The last course revises morphological topics covered earlier and extends the student's knowledge of more difficult language phenomena. It is especilexicology and on developing the student's writing skills. | ially focused on s | tylistics and |
| 04XCESP1 Czech for Foreign Students - Advanced 1 | 7 | 2 |
| The prerequisite of the course is very good knowledge of the Czech language, i.e., communicative competences at least at level B2 of the Common Et | - 1 | _ |
| It is focused partly on revision of standard language structures, but mainly on practising more complex grammatical structures typical of the style of standard language structures. | • | |
| basics of functional style of engineering and professional communication, both in spoken and written form. The topics include University Studies and | Student Life. Writ | tten practice |
| includes communication with teachers and faculty administrators. | 7 | 0 |
| 04XCESP2 Czech for Foreigners - Advanced 2 This course extends the student's knowledge acquired in CESP1 and focuses on difficult language phenomena. It practises working with technical a | Z nd specialist texts | 2 s placing greater |
| emphasis on individual work. | na specialist texte | s placing greater |
| 04XCESP3 Czech for Foreigners - Advanced 3 | Z | 2 |
| The course develops the student's knowledge from CESP2. It includes working with authentic specialist materials, their interpretation and presentation | on, and, finally, pre | esentation of the |
| student's project. Writing skills necessary for professional communication are trained. | | |
| 04XFM1 French for Intermediate Students M1 | Z | 2 |
| French - intermediate FM The objective of this three-semester course is to improve and further develop communication in the French language in bo will be able to communicate in social interaction and in academic, scientific and professional environment. They will be able to use the language to tr | | |
| information and to solve problems. FM1 The course builds on and further develops linguistic competence acquired at secondary school. It revises, sy | - | |
| skills gained in previous study. The following topics are covered: University studies in our country and in France, writing of transactional letters, CV, per | - | |
| to an advert, French culture and geography, Paris. Topics of specialization: mathematics, physics. Reading technical and popular science texts, work | based on these to | |
| 04XFM2 French for Intermediate Students M2 | Z | 2 |
| Course FM2 builds on FM1. Linguistic structures and competence acquired in previous study are systemized and expanded. Reading popular science and scientific language (passives, nominalization, word formation). Topics: physics, power engineering, environment, Internet, success of French science. | | |
| scientists, artists and architects. Description of an object, device, shapes, dimensions, material. | chec and technolog | ogy, i renen |
| 04XFM3 French for Intermediate Students M3 | Z | 2 |
| The course is focused on improvement and further development of linguistic competence acquired during the follow-up courses. Syntactic structures (| | |
| participle structures, compound tenses). Text summaryStudents prepare a written paper which will be delivered in form of an oral presentation in-cl | | |
| field of students' future specialisation or to their interest and generally covers a technical /applied science topic. It is not a translation but a creative w and one's own knowledge/experienceLonger monologues on topics /situations set for the examination are prepared. Text structure, cohesion and compared to the compared to th | • | n French articles |
| 04XFP1 French for Advanced Students P1 | Z | 2 |
| FP advanced course The objective of this three-semester course is to improve and further develop communication in the French language in both wi | ı | |
| be able to communicate in social interaction and in academic, scientific and work environment. They will be able to use the language to transmit general | eral and technical | information and |
| to solve problems. FP1 The course builds on and further develops linguistic competence acquired at secondary school. Difficult grammar topics are re | - | = |
| passé composé-imparfait, pronouns. The following specific topics are covered: University studies in our country and in France, writing of transactionar request, answer to an advert, environmental issues, success of French science and technology, chosen topics from French regional culture, Paris. Topi | | |
| internet, physics, chemistry. Reading of technical and popular science texts, further work with these texts and interpretation. | ioo or opoolalizatio | manomano, |
| 04XFP2 French for Advanced Students P2 | Z | 2 |
| With the link to P1 contents, the course further develops language skills. Focus is put on reading popular science texts and on oral communication of | n given topics. Fe | atures typical of |
| technical and scientific communication are stressed (passive voice, nominalization, word formation). | | |
| 04XFP3 French for Advanded Students P3 The course is focused as a veterilization and improvement of acquired linguistic competence, skills and knowledge, and their use for communication in | Z | 2 |
| The course is focused on systemization and improvement of acquired linguistic competence, skills and knowledge, and their use for communication in skill - translation of shorter texts (both from and into the language). Writing of a paper and making oral presentation in-class. The paper generally covered to the contraction of the language of the course of the cours | | - |
| topic. It is a creative work compiled from 3 French sources. Preparation of several set topics for oral examination. | | |
| 04XFZ1 French for Beginners Z1 | Z | 2 |
| French for beginners The objective of this 5-level course is to be able to communicate in French orally and in writing in situations of everyday life, in s | _ | • |
| The course includes French for specific / technical communication and reading of popular science and scientific texts. FZ1 The objective is to be able | | = |
| level, actively using the knowledge of chosen elementary language. The contents is roughly outlined by lessons 1 - 7 of the textbook Pravda - Pravda (Francouzština pro za áte ky). It is extended with situations of communication and functions from the textbook Espaces I, lessons 1-4: introductions, | | - |
| giving the directions, simple instructions and questions. Special attention is paid to pronunciation. Spelling is explained in connection with pronunciat | • | |
| 04XFZ2 French for Beginners Z2 | Z | 2 |
| The course is linking up with FZ1. Elementary linguistic knowledge and communication skills are expanded. The scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given by lessons 8 - 13 of the scope is given b | | |
| French for Beginners . Additional topics and skills are filled in from the textbook Espaces I, lesson 1 - 5 (introductions, invitation, welcoming, agreement thanking travelling man of France food expression of will wich erder prohibition placeure). Correct propulgiation is practiced. Stress on oral community of the propulgiation of the propulg | _ | |
| thanking, travelling, map of France, food, expression of will, wish, order, prohibition, pleasure). Correct pronunciation is practiced. Stress on oral comm How does the machine work? A few expressions concerning the study. Name of University and Faculty. | unication. Specific | cupius cuvered: |
| 04XFZ3 French for Beginners Z3 | Z | 2 |
| The course builts upon FZ2. Basic linguistic knowledge and skills are developed. The contents is given by lessons 14 - 18 of the textbook: Pravda - F | _ | _ |
| Topics, functions and situations are complemented from other materials. Stress is put on oral communication in dialogues and on reading, both for in | formation and lou | ıd as part of |
| pronunciation practice. Reading covers short adapted texts of general interest first, and later popular science texts. | | |
| | | |

| 04XFZ4 | French for Beginners Z4 | Z | 2 |
|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-------------------|
| - | FZ3. Basic linguistic knowledge and skills are further developed. Oral communication and reading skills are practiced. The c | | |
| | ktbook French for Beginners, and is expanded with topics and functions from other materials. Reading is developed from the lec ourse covers generals and specific topics: health- illness, sport, free time, environment, study, travelling in France, Paris, shop | | 0 0 |
| | now to write CV, application, topics in mathematics, reading physics - mechanics, informatics, internet. | sping, irodinoi, di | o.o.iy ou. |
| 04XFZ5 | French for Beginners Z5 | Z | 2 |
| • | FZ4 are further developed, as well as technical language. Students prepare a paper on a chosen popular science topic. The | | |
| • | ered by lessons 24 - 26 of the textbook: Pravda-Pravdova, French for Beginners, and is complemented from other materials. I | | |
| notes, success of Frenc subjunctive clauses, ger | h science and technology, information about France. Grammar is systemized and complemented with syntax (subordinate cla rund nassive | auses, typicai con | junctions, |
| 04XNM2 | German for Intermediate Students M2 | Z | 2 |
| - | ther more complex grammatical structures and their application in communication based on technical texts, such as the relation | l l | |
| the world at the beginning | ng of the 21st century, linguistically more demanding texts on the environment, the language of mathematics, computers and | car technology ef | tc. Students |
| - | mation and reading aloud, and appropriate language for various purposes in oral and written communication. The course system | natically revises ot | her grammatical |
| · · · · · · · · · · · · · · · · · · · | or professional discourse (participles, relative clauses). | 7 | |
| 04XNM1 | German for Intermediate Students M1 rse is to level off the students' skills in the German language. The course focuses on revision of more difficult phenomena and | Z | he nassive) and |
| | es (e.g. importance of verb prefixes). In the lexical part, it covers topics referring to higher education in both the Czech Repub | · - | |
| • | gether with all necessary expressions and phrases, expressions and phrases needed to chemists, mathematicians, physicist | | |
| terminology. It develops | communication on related topics and is aimed at correct pronunciation, grammatical correctness and understandability. | | |
| 04XNM3 | German for Intermediate Students M3 | Z | 2 |
| | ther more complex grammatical structures and their application in communication based on technical texts, such as the relation | | ٠, , , |
| • | ng of the 21st century, linguistically more demanding texts on the environment, the language of mathematics, computers and mation and reading aloud, and appropriate language for various purposes in oral and written communication. The course system | | |
| • | or professional discourse (participles, relative clauses). | idilodily rovided of | or grammanear |
| 04XNP1 | German for Advanced Students P1 | Z | 2 |
| This course requires go | od grammar knowledge, extended general vocabulary, and good communication skills acquired at secondary school to be lev | elled off at the be | eginning of the |
| | en focused on working with technical and scientific texts and practising reading techniques (skimming, scanning, reading for | - | |
| more difficult grammar st i.e., telephoning. | tructures necessary for understanding a subtechnical text (passive voice, participles, participle structures) and it also focuses on p | oractical everyday | communication, |
| 04XNP2 | German for Advanced Students P2 | Z | 2 |
| - | estudents' skills in working with professional scientific texts (understanding, summarising, note-taking, interpreting) while extend | _ | _ |
| • | duces mathematical expressions and texts of nuclear power engineering. Increasing emphasis is placed on understanding and | | |
| both written and oral (C) | V, letter of application, interview, scholarship), and more complex grammatical structures (i.e., subjunctive, indirect speech). | | |
| 04XNP3 | German for Advanced Students P3 | Z | 2 |
| | B main parts (general communicative situations, grammar and technical topics). Students will develop their vocabulary in a var r accidents, accident report, filling in a form, complaints). Based on presentations and technical and subtechnical texts, the vo | = | |
| • | ing, the environment, computer science, and car technology, will also be extended. Only authentic professional texts are used | , , | |
| | rocess information gained from their reading of complex and difficult texts and present it to the class in a simplified oral form. The | | |
| practice to and from Ge | rman. | | |
| 04XRM1 | Russian for Intermediate Students M1 | Z | 2 |
| • | for students with previous knowledge of Russian from secondary schools. Students are supposed to know the Russian alphab | | · · |
| | nmunication in everyday situations (introductions, socializing, greetings, shopping for food and objects of everyday need, aski nmar structures (verbal and nominal forms, irregular verbs, pronouns). The initial knowledge corresponds to the achievement | | |
| , | he course correspond approximately to the RZ3 course, but for half of the time allotted in the timetable. | | |
| 04XRM2 | Russian for Intermediate Students M2 | Z | 2 |
| | the RM1 course, its contents and scope correspond roughly to RZ4, however, for half of the time allotted in the timetable. | <u> </u> | |
| 04XRM3 | Russian for Intermediate Students M3 | Z | 2 |
| The course develops the in the timetable. | e knowledge and skills acquired in RM1 and RM2 and its contents and scope are roughly at the same level as those of RZ5, ho | owever, for half of | the time allotted |
| 04XRP1 | Russian for Advanced Students P1 | Z | 2 |
| | ent for the course is to achieve the B1 CEFR level. The objective of the course is revision of standard language structures, pra | ı | |
| · · | ng the fundamentals of technical language and training writing skills. | J | |
| 04XRP2 | Russian for Advanced Students P2 | Z | 2 |
| | RP1. It expands grammatical structures important for understanding technical texts (verbal adjectives, participles, passives, | verb aspects, spe | cific syntactic |
| | t on independent oral and written communication. | | |
| 04XRP3 | Russian for Advanced Students P3 | Z | 2 |
| | RP2 and is mainly focused on working with technical and scientific texts (reading comprehension, oral and written paraphras revious knowledge of general language at secondary level (listening, reading, correct communication in everyday situations). | | |
| | dy is aimed at professional and technical skills (reading technical literature according to the students' specialization, oral and | | |
| develop their subtechnic | cal vocabulary and practice quick and correct communication in professional situations. They will be able to both speak write a | accurately and wit | h confidence on |
| technical topics. | | | |
| 04XRZ1 | Russian for Beginners Z1 | Z | 2 |
| • | he first stage of the five-semester programme, its final aim being reading and understanding professional texts written in Russ or both reading and writing skills) and fundamentals of grammar necessary for everyday communication (listening and speaki | _ | - 1 |
| | I stress, understand its contents and summarize it. | J,. = 1000.110 WIII | |
| 04XRZ2 | Russian for Beginners Z2 | Z | 2 |
| | the programme is designed to teach skills for basic communication in everyday situations and for reading easy and short su | | |
| | ing short sentences and appropriate structures, and read aloud with confidence a short text without marked stress. They will be able to use it in writing | also develop their | vocabulary and |
| master further grammat | ical structures. They will have mastered with confidence the Russian alphabet and will be able to use it in writing. | | |
| | | | |

| 04XRZ3 | Russian for Beginners Z3 | Z | 2 |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------|
| _ | d on RZ2 and includes further everyday topics, develops understanding of short compact texts on new subtechnical topics (for | raining various forms | of reading skil |
| | ntroduces new grammar. Students will be trained to distinguish intonation patterns while listening to spoken language. They w | • | • |
| | express their opinion. Writing skills will be trained on guided writing tasks and note-taking. | · | |
| 04XRZ4 | Russian for Beginners Z4 | Z | 2 |
| | d on RZ3. It improves and expands the knowledge of general language in all four skills (reading and understanding longer texts v | _ | l |
| | nication in everyday situations, writing longer texts). Students are trained to use grammar structures effectively (e.g., irregular | | 0 |
| | ty, imperatives, conditionals). They practice and develop communication skills for everyday situations (food, travelling, free time | | - |
| | nore specific topics (environment, addictions, the green movement). They become acquainted with various geographical data | | |
| | nformation from the timetable, learn about Russian holidays and typical meals. | (- 3 , , , | |
| 04XRZ5 | Russian for Beginners Z5 | Z | 2 |
| - | the student to have completed RZ4. It concentrates predominantly on reading skills (working with professional texts, i.e. under | 1 | l |
| · · | specialized text) and speaking, and to a certain extent, writing about the professional information obtained by reading the texts | | |
| | udying grammar is based on professional and technical texts and only includes items typically used in professional communic | | |
| | dents develop their technical and economic vocabulary, and are also trained in some professional skills (writing a CV, polite re | | oo, pao.p.oo, |
| 04XSM1 | Spanish for Intermediate Students M1 | Z | 2 |
| - | ned for students whose competence is at level B1 of CEFR, i.e. those who studied Spanish in the secondary school. The 3-se | _ | - |
| - | s attention to further grammar topics (e.g., perifrasis verbales, futuro imperfecto, direct object and indirect object pronouns, n | | • |
| | ten and oral communication on a given everyday or easy subtechnical topic, for which the students are trained by reading text | _ | - |
| | | | |
| 04XSM2 | Spanish for Intermediate Students M3 | , Z | 2 |
| = | is the students' knowledge from the previous course (SM1). Students are gradually acquainted with fundamentals of Spanish | for specific purposes | s in order to be |
| <u>.</u> | pecialized texts on the Internet. | | |
| 04XSM3 | Spanish for Intermediate Students M3 | Z | 2 |
| | re supplemented with additional subtechnical materials, so the students will be gradually acquainted with the peculiarities of a | | - |
| • | nternet in Spanish and search for information of their specialization or field of interest. Students will use the information to wri | te short articles and | summaries. Th |
| inal part of the pro | gramme, general Spanish course based on course books, covers presentations and, finally, a written and oral examination. | | |
| 04XSP1 | Spanish for Advanced Students P1 | Z | 2 |
| Course concentrate | is on more difficult grammar topics, revision of vocabulary, basics of Spanish for specific purposes as well as written communi | cation. Course prere | quisites: level l |
| of CEFR. | | | |
| 04XSP2 | Spanish for Advanced Students P2 | Z | 2 |
| Course SP2 is the | second part of the advanced Spanish course, extending Spanish for specific purposes topics. It comprises more grammar and | syntax and focuses | on independe |
| written communicat | ion. | | |
| 04XSP3 | Spanish for Advanced Students P3 | Z | 2 |
| | inal part of the advanced Spanish course. It is based on texts chosen by the students according to their future specialization. It | _ | _ |
| | ents will need in their career. | | |
| 04XSZ1 | Spanish for Beginners Z1 | Z | 2 |
| - | rst stage of the five-semester programme of Spanish studies; during the first stage the students will master phonetics and fund | 1 | l |
| | cate at an elementary level on topics of everyday life. They will acquire and extend fundamental vocabulary of general Spanis | - | |
| 04XSZ2 | Spanish for Beginners Students Z2 | Z | 2 |
| _ | , · | _ | - |
| | d on course SZ1, and expects students to develop and extend the knowledge and skills acquired so far. Grammar structures are | | |
| | short adapted written texts and speech. Attention is also paid to cultural differences between Spanish-speaking countries and | d others such as the | Czecn Republ |
| | peaking countries are also included. | | |
| 04XSZ3 | Spanish for Beginners Z3 | Z | 2 |
| | d on course SZ2, and develops the student´s vocabulary and grammar structure. The course covers realia (history and culture | | - |
| | ays attention to further grammar topics (pretérito perfecto, pretérito indefinido, pretérito imperfecto, the gerund and the imper | ative). It includes writ | ten and oral |
| | a given general topic, for which the student is trained by reading texts or listening to them. | | |
| 04XSZ4 | Spanish for Beginners Z4 | Z | 2 |
| The course is base | d on course SZ3. It develops the student's vocabulary and extends the knowledge of the culture and social customs of the Sp | anish speaking cour | tries, mainly o |
| Spain. It pays atten | tion to further grammar topics (perífrasis verbales, futuro imperfecto, direct object and indirect object pronouns, negative form | of the imperative, ar | d subjunctive) |
| o written and oral o | communication on a given general or subtechnical topic, for which the student is trained by reading texts or listening to them. | | |
| 04XSZ5 | Spanish for Beginners Z5 | Z | 2 |
| | 1 . | nich for epocific purp | l |
| The course books a | re supplemented with additional subtechnical materials, so the students will be gradually acquainted with peculiarities of Spa | man for specific purp | 0363. 111 113 1111 |

List of courses of this pass:

| Code | Name of the course | Completion | Credits |
|--------|-------------------------------------------------------------------------------------------------------|------------|---------|
| 00EKOT | Economy in Technology | Z | 1 |
| · · | The course introduces the basics of micro- and macroeconomics. | • | |
| 00ETV | Ethics of Science and Technology | Z | 1 |
| 00MAM1 | Essentials of High School Course 1 | Z | 1 |
| · · | Students are introduced to mathematical concepts and methods used in the introductory physics course. | • | |
| 00MAM2 | Essentials of High School Math Course 2 | Z | 1 |
| , | Review of basics of high school mathematics. | • | , |
| 00PT | Preparatory Week | Z | 2 |

| 00RET | Rhetoric | Z | 1 |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------|
| | used on the acquisition of speech and voice techniques and on the rules of correct pronounciation. The course is also devoted to the | | - 1 |
| | nonverbal aspects. Stylistics exercises, strategies for coping with stage-fright and a short excursion into the history of rhetoric are an | | |
| 00UPRA | Introduction to Law | Z | 1 |
| 00UPSY | Introduction to Psychology | Z | 1 |
| 01ANB3 | Calculus B 3 | Z,ZK | 8 |
| | quences and series - convergence range, criteria of uniform convergence, continuity, limit, differentiation and integration of functional | | |
| - | or's theorem. 2. Ordinary differential equations - equations of first order (method of integration factor, equation of Bernoulli, separation | | - 1 |
| • | equation) and equations of higher order (fundamental system, reduction of order, variation of parameters, equations with constant coe tial equation). 3. Metric spaces - metric, norm, scalar product, neighborhood, interior and exterior points, boundary point, isolated and | - | - 1 |
| | ss of space, Hilbert spaces. Orthogonal polynomials. Complete orthogonal systems. 4. Fourier series - expansion of functions into Fourier | · · | - 1 |
| · · | onvergence. 5. Differential calculus of functions of several variables - limit, continuity, partial and directional derivative, gradient, total c | - | |
| | Taylor series, elementary terms of vector analysis, Jacobi matrix. 6. Functions defined implicitly by one or several equations | 5. | |
| 01ANB4 | Calculus B 4 | Z,ZK | 6 |
| [1] Diferenciální p | o et funkcí více prom nných a funkcionálních vektor . [2] Funkce zadané implicitn . [3] Taylorovy ady funkce více prom nných. [4] F | Regulární zobrazer | ní, zám na |
| | kartézské soustavy sou adnic. [5] Lokální, vázané a globální extrémy funkce více prom nných. [6] Základy teorie míry a obrys konstr | | |
| Integrální po et f | runkce více prom nných - Riemann v a Lebesgue v integrál, základní vlastnosti, Fubiniova v ta, v ta o substituci. Leviho a Lebesgue | eova v ta. Limita, s | spojitost a |
| 041.41 | derivace integrálu podle parametru. [8] Integrály po k ivkách a plochách. Integrální v ty. | 7 | 2 |
| 01LAL | Linear Algebra 1 2. Linear dependence and independence. 3. Basis and dimension. 4. Subspaces of vector spaces. 5. Linear mappings. 6. Matrices of li | Z inear mannings 7 | 2 Frobenius |
| 1. Vector space. 2 | theorem. | inear mappings. 7. | Tiobernus |
| 01LAL2 | Linear Algebra 2 | Z,ZK | 4 |
| - | se matrix and operator. 2. Permutation and determinant. 3. Spectral theory (eigenvalue, eigenvector, diagonalization). 4. Hermitian an | | |
| | gonality. 6. Metric geometry. 7. Riesz theorem and adjoint operator. Outline of the exercises: 1. Methods for calculation of inverse matri | • | I |
| of determinants | . 3. Calculation of eigenvalues and eigenvectors. 4. Hermitian and quadratic forms. Canonical form. 5. Scalar product and orthogonalit | y. Calculation of or | thogonal |
| | complements. 6. Geometry exercises and examples. 7. Adjoint operators. | | |
| 01LALZ | Linear Algebra 1, exam | ZK | 2 |
| 01MAN | Calculus 1 | Z | 4 |
| | Basic calculus (real analysis, functions of one real variable, differential calculus). | | |
| 01MAN2 | Calculus 2 | Z,ZK | 8 |
| | differential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergence, operations on series, absolute ar | | - 1 |
| Real and complex | power series, the Cauchy-Hadamard theorem, expansion of function into power series, summation of infinite series. 4. Theory of integr (Riemann definition), techniques of integration and application of integrals, Generalized Riemann integral | als: primitives, defi | inite integrai |
| 01MANZ | Calculus 1, exam | ZK | 4 |
| 01NME2 | Numerical Methods 2 | KZ | 2 |
| _ | Numerical Metrious 2 ted to numerical solution of boundary-value problems and intial-boundary-value problems for ordinary and partial differential equations. | | _ |
| | dary-value problems to initial-value problems and finite-difference methods for elliptic, parabolic and first-order hyperbolic partial difference methods for elliptic, parabolic and first-order hyperbolic partial difference methods for elliptic, parabolic and first-order hyperbolic partial difference methods for elliptic, parabolic and first-order hyperbolic partial difference methods for elliptic, parabolic and first-order hyperbolic partial difference methods for elliptic, parabolic and first-order hyperbolic partial difference methods for elliptic, parabolic and first-order hyperbolic partial difference methods for elliptic, parabolic and first-order hyperbolic partial difference methods for elliptic, parabolic and first-order hyperbolic partial difference methods for elliptic, parabolic and first-order hyperbolic partial difference methods for elliptic, parabolic and first-order hyperbolic partial difference methods for elliptic, parabolic and first-order hyperbolic partial difference methods for elliptic, parabolic and first-order hyperbolic partial difference methods for elliptic, parabolic and first-order hyperbolic partial difference methods for elliptic parabolic and first-order hyperbolic partial difference methods for elliptic parabolic and first-order hyperbolic partial difference methods for elliptic parabolic p | | 3 converting |
| 01PRST | Probability and Statistics | Z,ZK | 4 |
| | e of probability theory and mathematical statistics. The probability theory is build gradually beginning with the classical definition and | | Colmogorov |
| definition. The noti | ons as random variable, distribution function of random variable and characteristics of random variable are treated and basic limit the | orems are stated a | and proved. |
| | e basis of this theory the basic methods of mathematical statistics such as estimation of distribution parameters and hypothesis testin | | |
| 01PSL | LaTeX - Publication Instrument | Z | 2 |
| | The course is devoted to the basics and facilities of computer typography, particularly to the system LaTeX | | |
| 01RMAF | Equations of Mathematical Physics | Z,ZK | 7 |
| The subject of this | course is solving integral equations, theory of generalized functions, classification of partial differential equations, theory of integral transport partial differential equations (boundary value problem for eliptic PDE, mixed boundary problem for eliptic PDE). | ansiormations, and | a solution of |
| 01STME | Statistical Methods with Applications | ZK | 2 |
| | ts of selected methods of statistical data analysis such as: linear regression and correlation, analysis of variance, nonparametric met | | |
| | cation. The aim is to illustrate the use of statistical procedures on examples. Solutions of concrete examples by use of statistical softw | | |
| 02DEF1 | History of Physics 1 | Z | 2 |
| Physics and its pl | ace in the system of sciences. The relationship of man and nature. Natural sciences in ancient Orientand Greece, Greek natural philo | sophers, Aristotle. | Physics in |
| Helenistic period, | Archimed. Arabic science, European science in Middle Ages. Renaissance - da Vinci, Giordano Bruno. Copernicus, Kepler, Galileo, H | Huygens. The birth | of physics |
| | as experimental science. Newton and his work. | | _ |
| 02DEF2 | History of Physics 2 | Z | 2 |
| - | of classical mechanics after Newton, Bernoulli's, Euler, Lagrange. Historical development of optics, corpuscular and wave approach. E | - | |
| _ | vanism, electrodynamics and electromagnetism, Faraday and Maxwell. Thermodynamics and its laws, statistical physics, Boltzmann. Physics, Planck and Einstein. Discovery of radioaktivity, structure of atom, atomic nucleus, Rutherford and Bohr. The way to nuclear er | | |
| and rolativious p | standard model. The concept of Nature and Universe of today. | lorgy, Elomoritary | partioloo, |
| 02ELMA | Electricity and Magnetism | Z,ZK | 6 |
| | bulomb's law, electrostatic field, Gauss' law. Electric dipole, polarization. Conductors and dielectrics. Electric current and circuits, cond | | |
| theory. | Electrodynamic forces, magnetic field. Magnetic dipole, magnetics. Electromagnetic induction, RLC circuits. Electromagnetic waves, I | Maxwell equations. | · |
| 02MECH | Mechanics | Z | 4 |
| | hysics, physical quantities and units. Kinematics of a particle, basic types of motion and their superposition. Dynamics of a particle, so | | |
| one-dimensional r | notion, motion in a central force field, forces in non-inertial reference frames. Mechanics of a system of particles, two-body problems, | particle collisions. | Mechanics |
| 001450117 | of a rigid body, rotation. | 71/ | |
| 02MECHZ | Mechanics - Examination The content of the subject in the examination according to the plan of studies. | ZK | 2 |
| 02TEF1 | The content of the subject is the examination according to the plan of studies. Theoretical Physics 1 | Z,ZK | 4 |
| | Theoretical Physics 1 troduction to analytical mechanics. The students acquire knowledge of the basic concepts of the Lagrange and Hamiltonian formalisms | | |
| | dynamics (Newtons, Lagrange, Hamilton and Hamilton-Jacobi equations). The efficiency of these methods is illustrated on elementary | | |
| | | | |

problem, the motion of a system of constrained mass points, and of a rigid body. Advanced parts of the course cover differential and integral principles of mechanics. The subject is the first part of the course of classical theoretical physics (02TEF1, 02TEF2). Heat and Molecular Physics 02TER 7 7K Thermal expansion of materials, heat transfer; stationary and non-stationary heat conduction, heat transfer and penetration; 1st and 2nd thermodynamic principle, ideal and real gas, entropy; non-chemical systems: dielectric and magnetic materials; Maxwell relations and thermodynamic potentials; kinetic theory: Maxwell's velocity distribution, equipartition theorem. Thermodynamics and Statistical Physics Foundation of thermodynamics and statistical physics. Thermodynamic potential, the Joule Thomson effect, conditions of equilibrium, the Braun-Le Chatelier principle. Statistical entropy, Basics of many body descriptionfrom a statistical point of view (classical and quasiclassical regime within the frame of a canonical and grand-canonical ensemble, Fermi gas, models of crystals and the black body radiation). The Boltzmann equation is used to discusses simple transport phenomena. 02UFEC Introduction to Elementary Particle Physics The course provides an easily accessible introduction to elementary particle physics. Development, methods, goals and perspectives of the subject are presented. 02VOAF Waves, Optics and Atomic Physics 6 Wave phenomena in mechanics and electromagnetism: modes, standing and travelling waves, wave packets indispersive media. Wave optics: polarization, interference, diffraction, coherence. Geometrical optics. Introduction to quantum physics: black body radiation, quantum of energy, photoeffect, the Compton effect, the de Broglie waves,the Schrodinger equation, stationary states and spectra of finite systems. Foundations of Physical Measurements 1 02ZM1 The lecture is designed for students of physical specializations (Experimental particle physics, Physical engineering, Nuclear engineering), however, it can be attended by students of other branches. The goal of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired data on a PC. Students learn the basic habits of work in a physics lab. 02ZM2 Foundations of Physical Measurements 2 ΚZ 4 The lecture is designed for students of physical specializations (Experimental particle physics, Physical engineering, Nuclear engineering), however, it can be attended by students of other branches. The goal of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired data on a PC. Students learn the basic habits of work in a physics lab. 04AKS **English Conversation** 7 1 The course will develop the student's communication skills acquired throughout their previous studies. It aims to improve all aspects of oral communication. The student will develop their vocabulary for various communication situations and will master their communication strategy. They will also practise their listening skills in order to better follow and participate in discussions. The student will be trained to express their ideas clearly and according to current English usage, and become a more confident speaker. 04XAM1 English for Intermediate Students M1 The course is designed for students who have successfully completed the full secondary school English language course at least at the A2 level of the Common European Framework of Reference for Languages (CEFR). It provides an introduction into English for Specific and Academic Purposes (ESP, EAP), i.e., into fundamentals of vocabulary and style typical of professional oral and written communication situations. Thus it covers topics related to the student's life and needs as well as topics of subtechnical interest. Attention is also paid to extending the knowledge of grammar issues used in EAP. 04XAM2 2 English for Intermediate Students M2 The AM2 course expects the student to have completed the AM1 course. It develops their skills for work with subtechnical texts, focusing also more on specific grammar, functions, and lexical items typical of ESP and EAP (e.g., definition, existence and classification of phenomena, object descriptions). Part of the course is also guided writing. If necessary, grammar revision is included. 04XAM3 English for Intermediate Students M3 7 2 The course develops the skills that enable students to cope with features typical of professional style. Increasing attention is paid to developing subtechnical vocabulary and independent understanding of professional texts. Great emphasis is placed on distinguishing different levels of formal and informal oral and written communication and their appropriate Czech equivalents. The course also includes studying abstracts and rules for writing them as well as basic rules for preparing and giving a short presentation on a chosen topic related to the 04XAMZK English for Intermediate Students Examination The course content is the examination as given by the study plan. The examination covers the AM1, AM2, and AM3 courses and consists of two parts - written (100 min) and oral (20-30 min). The student is expected to master the AM syllabus and demonstrate the ability to apply their knowledge gained in the three English courses. 04XAP1 English for Advanced Students P1 2 The course is designed for students who have successfully completed the full secondary school English language course (at least the B1 level of the Common European Framework of Reference for Languages - CEFR). It provides an introduction into English for Specific and Academic Purposes (ESP, EAP), i.e., into the fundamentals of vocabulary, functions, grammar, and style typical of professional oral and written communication situations (fundamentals of terms in mathematics and physics, definitions, graph descriptions, etc.). It also covers professional oral and written communication on topics related to the undergraduate's life and needs. It develops skills for free professional writing (writing a CV, letter of application, polite request). If necessary, revision of selected grammar topics is included. 04XAP2 English for Advanced Students P2 The AP2 course is based on AP1, thus extending the student's skills for working with subtechnical texts, and even with professional texts of chosen branches of science. According to the students' needs it concentrates on chosen grammar topics, but mainly intends to develop understanding of syntactic structures and typical rhetorical functions (e.g., various types of descriptions, and, if possible, a case study). Increasing emphasis is placed on the undergraduate's independent work with and reading of linguistically more demanding materials. The course extends the student's subtechnical vocabulary, and includes fundamental notions of chosen branches of science. It is focused on formal writing including the sentence and paragraph structure, linking, cohesion and coherence in texts. 04XAP3 English for Advanced Students P3 The AP3 course is based on AP2 and expects the student to work without any guidance with authentic professional materials and to interpret the text. It includes training oral and written communication skills and functions (e.g., expressing an opinion, agreement, and objections; taking part in discussion, note-taking; summarizing, writing an abstract) and, if possible, also preparing a project on a given or chosen topic and presenting it. The course places emphasis on distinguishing levels of formal and informal language both in oral and written English for Advanced Students Examination The course content is the examination as given by the study plan. The student is supposed to demonstrate mastering the AP3 syllabus and the ability to apply their knowledge obtained in the three AP courses. The examination consists of 2 parts - written (100 min) and oral (30 min) and includes also oral presentation of a topic from the student's field of study. 04XCESM1 Czech for Foreigners - Intermediate 1 2 The course is focused on correct pronunciation, important morphological phenomena, prepositional phrases, and verb forms as well as on extending the student's vocabulary for various social situations. Czech for Foreigners - Intermediate 2 The course develops the topics covered in CESM1 and is then focused on more difficult grammar phenomena. It practices writing, speaking, and reading skills and trains the student in understanding common abbreviations, abbreviated words, and mathematical terms and formulas.

| 04XCESM3 | Czech for Foreigners - Intermediate 3 | Z | 2 |
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| | evises morphological topics covered earlier and extends the student's knowledge of more difficult language phenomena. It is especia | ally focused on st | ylistics and |
| | lexicology and on developing the student's writing skills. | | |
| 04XCESMZK | Czech for Intermediate Students Examination | ZK | 4 |
| he course conter | nt is the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of the CES | M1,2,3 courses a | and can on |
| | be taken after successful completion of the 3 courses. Detailed information is to be obtained from the teacher. | | |
| 04XCESP1 | Czech for Foreign Students - Advanced 1 | _ Z | 2 |
| | the course is very good knowledge of the Czech language, i.e., communicative competences at least at level B2 of the Common Europ | | |
| | on revision of standard language structures, but mainly on practising more complex grammatical structures typical of the style of sci all style of engineering and professional communication, both in spoken and written form. The topics include University Studies and S | | • |
| basics of fariction | includes communication with teachers and faculty administrators. | Stadent Lile. With | on practice |
| 04XCESP2 | Czech for Foreigners - Advanced 2 | Z | 2 |
| | s the student's knowledge acquired in CESP1 and focuses on difficult language phenomena. It practises working with technical and | _ | _ |
| | emphasis on individual work. | | |
| 04XCESP3 | Czech for Foreigners - Advanced 3 | Z | 2 |
| he course develor | os the student's knowledge from CESP2. It includes working with authentic specialist materials, their interpretation and presentation, | and, finally, prese | ntation of |
| | student's project. Writing skills necessary for professional communication are trained. | | |
| 04XCESPZK | Czech for Foreign Students - Advanced Examination | ZK | 4 |
| The course conter | nt is the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of the CES | SP1,2,3 courses a | ind can on |
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| 04XCESZ1 | Czech for Foreigners - Beginners 1 | Z | 2 |
| - | pred for students of the English programme. Students will become acquainted with the main characteristics of Czech (phonetic and g lage and speaking skills. The course focuses on pronunciation exercises, simple social phrases, and oral and written communication | , | - |
| quire basic larige | situations. The course covers roughly lessons 1-3 of estina Express (Czech Express) by L. Holá and P. Bo ilová. | iii tile illost colliii | ion every |
| 04XCESZ2 | Czech for Foreigners - Beginners 2 | Z | 2 |
| | communication competences acquired in CESZ1 are further developed. Students deepen their knowledge of the declension and cor | _ | 1 |
| 33 | basic communication topics. The course covers roughly lessons 3-5 in Czech Express by L. Holá and P. Bo ilová. | ,. 5 | |
| 04XCESZ3 | Czech for Foreigners - Beginners 3 | Z | 2 |
| | r develops the language and communication competences acquired in the XCESZ1 and XCESZ2 courses. The teaching focuses on | building up basic | vocabular |
| king correct pronu | nciation and deepening grammar, features through practice, as well as introducing the Czech culture. Students are asked to produce | simple texts and | they pract |
| equent types of di | alogue. They also practise understanding texts in terms of main ideas or looking for specific details in texts. The course covers roughly | lessons 5-7 in | eština expi |
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| 04XCESZZK | Czech for Foreigners Beginners - Examination | ZK | 4 |
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| | | CESZ1,2,3 cours | es and ca |
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| 04XFZ1 | French for Beginners Z1 | Z | 2 |
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| • | objective of this 5-level course is to be able to communicate in French orally and in writing in situations of everyday life, in soci | | |
| | nch for specific / technical communication and reading of popular science and scientific texts. FZ1 The objective is to be able to he knowledge of chosen elementary language. The contents is roughly outlined by lessons 1 - 7 of the textbook Pravda - Pravo | | - 1 |
| · - | e ky). It is extended with situations of communication and functions from the textbook Espaces I, lessons 1-4: introductions, pe | _ | |
| giving the directio | ons, simple instructions and questions. Special attention is paid to pronunciation. Spelling is explained in connection with pronu | nciation and gramm | ar. |
| 04XFZ2 | French for Beginners Z2 | Z | 2 |
| | with FZ1. Elementary linguistic knowledge and communication skills are expanded. The scope is given by lessons 8 - 13 of the | | |
| • | Additional topics and skills are filled in from the textbook Espaces I, lesson 1 - 5 (introductions, invitation, welcoming, agreement of the control of the | • | |
| thanking, travelling, map o | of France, food, expression of will, wish, order, prohibition, pleasure). Correct pronunciation is practiced. Stress on oral communication to the Modes the machine work? A few expressions concerning the study. Name of University and Faculty. | cation. Specific topic | s covered: |
| 04XFZ3 | French for Beginners Z3 | Z | 2 |
| ı | FTERIOR DEGITIOES 23 FZ2. Basic linguistic knowledge and skills are developed. The contents is given by lessons 14 - 18 of the textbook: Pravda - Pra | | |
| • | ituations are complemented from other materials. Stress is put on oral communication in dialogues and on reading, both for info | | - 1 |
| | pronunciation practice. Reading covers short adapted texts of general interest first, and later popular science texts. | | |
| 04XFZ4 | French for Beginners Z4 | Z | 2 |
| · · · · · · · · · · · · · · · · · · · | FZ3. Basic linguistic knowledge and skills are further developed. Oral communication and reading skills are practiced. The cor | | |
| | book French for Beginners, and is expanded with topics and functions from other materials. Reading is developed from the lectur ourse covers generals and specific topics: health- illness, sport, free time, environment, study, travelling in France, Paris, shopp | | ٠ ١ |
| Students of 1 31 i. The co | country and in France, how to write CV, application, topics in mathematics, reading physics - mechanics, informatics, internet | _ | Sity iii Oui |
| 04XFZ5 | French for Beginners Z5 | Z | 2 |
| | FZ4 are further developed, as well as technical language. Students prepare a paper on a chosen popular science topic. They pr | esent it orally in the | |
| general contents is cover | ered by lessons 24 - 26 of the textbook: Pravda-Pravdova, French for Beginners, and is complemented from other materials. To | pics: on physics from | m lecture |
| notes, success of Fren | nch science and technology, information about France. Grammar is systemized and complemented with syntax (subordinate cla | auses, typical conjui | nctions, |
| 0.43/5771/ | subjunctive clauses, gerund, passive. | | |
| 04XFZZK | French for Beginners Examination | ZK | 3 |
| The content is the examin | nation as given by the study plan. The course is terminated with an examination consisting of oral and written part. The examin Instruction for examination. Its content covers the levels FZ1 - FZ5. | ation is ruled by the | document |
| 04XNM1 | German for Intermediate Students M1 | Z | 2 |
| | se is to level off the students' skills in the German language. The course focuses on revision of more difficult phenomena and st | | |
| word formation proce | esses (e.g. importance of verb prefixes). In the lexical part, it covers topics referring to higher education in both the Czech Repu | blic and Germany, o | current |
| | ogether with all necessary expressions and phrases, expressions and phrases needed to chemists, mathematicians, physicists | | tals of IT |
| | nology. It develops communication on related topics and is aimed at correct pronunciation, grammatical correctness and unders | | |
| 04XNM2 | German for Intermediate Students M2 | Z | 2 |
| | ner more complex grammatical structures and their application in communication based on technical texts, such as the relation be ing of the 21st century, linguistically more demanding texts on the environment, the language of mathematics, computers and o | • | • |
| - | nation and reading aloud, and appropriate language for various purposes in oral and written communication. The course systemati | | |
| | phenomena important for professional discourse (participles, relative clauses). | - | |
| 04XNM3 | German for Intermediate Students M3 | Z | 2 |
| | ner more complex grammatical structures and their application in communication based on technical texts, such as the relation be | | - 1 |
| • | ing of the 21st century, linguistically more demanding texts on the environment, the language of mathematics, computers and on a the language of mathematics, computers and on a the language for various purposes in oral and written communication. The course systemati | 0, | |
| practise reading for inform | phenomena important for professional discourse (participles, relative clauses). | cally revises offici gi | ammancai |
| 04XNMZK | German for Intermediate Students Examination | ZK | 4 |
| ı | examination as given by the study plan. The whole German for Intermediate Students Course is completed by an examination of | | ts - written |
| and oral, which cover the | e courses NM1 - NM3. The oral part follows after passing the written part successfully and after obtaining the 04NM3 assessment | ent. More detailed in | formation |
| | is to be obtained from the teacher. | | |
| 04XNP1 | German for Advanced Students P1 | Z | 2 |
| · - | od grammar knowledge, extended general vocabulary, and good communication skills acquired at secondary school to be level | _ | - 1 |
| | en focused on working with technical and scientific texts and practising reading techniques (skimming, scanning, reading for d uctures necessary for understanding a subtechnical text (passive voice, participles, participle structures) and it also focuses on pra | , | |
| o.o aoun g.aa. our | i.e., telephoning. | onedi every day com | |
| 04XNP2 | German for Advanced Students P2 | Z | 2 |
| The course develops the s | students' skills in working with professional scientific texts (understanding, summarising, note-taking, interpreting) while extending | their general and su | ıbtechnical |
| · - | luces mathematical expressions and texts of nuclear power engineering. Increasing emphasis is placed on understanding and pra | - | nunication, |
| | itten and oral (CV, letter of application, interview, scholarship), and more complex grammatical structures (i.e., subjunctive, indi | rect speech). | |
| 04XNP3 | German for Advanced Students P3 | L L | 2 |
| | B main parts (general communicative situations, grammar and technical topics). Students will develop their vocabulary in a varie accidents, accident report, filling in a form, complaints). Based on presentations and technical and subtechnical texts, the voca | = | |
| | ing, the environment, computer science, and car technology, will also be extended. Only authentic professional texts are used. | | |
| students are trained to pro | ocess information gained from their reading of complex and difficult texts and present it to the class in a simplified oral form. The complex and difficult texts and present it to the class in a simplified oral form. | ourse also includes | translation |
| <u>, </u> | practice to and from German. | | |
| 04XNPZK | German for Advanced Students Examination | ZK | 4 |
| | e examination as given by the study plan. The whole German for Advanced Students Course is completed by an examination of | | |
| and oral, which cover tr | ne courses NP1 - NP3. The oral part follows after passing the written part successfully and after obtaining the 04NP3 ungraded information is to be obtained from the teacher. | ı assessinent. Möre | uetalled |
| 04XRM1 | Russian for Intermediate Students M1 | Z | 2 |
| ı | or students with previous knowledge of Russian from secondary schools. Students are supposed to know the Russian alphabet (| I I | |
| - | munication in everyday situations (introductions, socializing, greetings, shopping for food and objects of everyday need, asking | | |
| they can use basic grai | mmar structures (verbal and nominal forms, irregular verbs, pronouns). The initial knowledge corresponds to the achievement l | | rse. The |
| | contents and scope of the course correspond approximately to the RZ3 course, but for half of the time allotted in the timetab | le. | |
| | | | |

| 04XRM2 | Russian for Intermediate Students M2 | Z | 2 |
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| | The course is based on the RM1 course, its contents and scope correspond roughly to RZ4, however, for half of the time allotted in the | | 2 |
| 04XRM3 The course develop | Russian for Intermediate Students M3 os the knowledge and skills acquired in RM1 and RM2 and its contents and scope are roughly at the same level as those of RZ5, howe in the timetable. | Zever, for half of the | 2 time allotted |
| 04XRMZK | Russian for Intermediate Students Examination | ZK | 4 |
| | t is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowled | | |
| | ents are eligible for the oral examination only after a prior pass in RM3 and a successful written examination. Students are given inst | - | |
| 04XRP1 | | Z | 2 |
| - | Russian for Advanced Students P1 uirement for the course is to achieve the B1 CEFR level. The objective of the course is revision of standard language structures, prac | _ | |
| | structures, understanding the fundamentals of technical language and training writing skills. | | grammar |
| 04XRP2 | Russian for Advanced Students P2 | Z | 2 |
| The course is bas | ed on RP1. It expands grammatical structures important for understanding technical texts (verbal adjectives, participles, passives, νε structures). Stress is put on independent oral and written communication. | erb aspects, specifi | c syntactic |
| 04XRP3 | Russian for Advanced Students P3 | 7 | 2 |
| | ed on RP2 and is mainly focused on working with technical and scientific texts (reading comprehension, oral and written paraphrasin | . – | |
| | od previous knowledge of general language at secondary level (listening, reading, correct communication in everyday situations). The | - | |
| | er study is aimed at professional and technical skills (reading technical literature according to the students' specialization, oral and w | · · · · · · · · · · · · · · · · · · · | - |
| | chnical vocabulary and practice quick and correct communication in professional situations. They will be able to both speak write acc | · · · · · · · · · · · · · · · · · · · | |
| | technical topics. | aratory and with oc | 1111001100 011 |
| 04XRPZK | Russian for Advanced Students Examination | ZK | 4 |
| _ | it is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowled | | · · |
| | ents are eligible for the oral examination only after a prior pass in RP3 and a successful written examination. Students are given insti | | |
| 04XRZ1 | Russian for Beginners Z1 | 7 | 2 |
| _ | Russian for Degrinners 21 ents the first stage of the five-semester programme, its final aim being reading and understanding professional texts written in Russian | Thus it bogins wit | |
| | per (for both reading and writing skills) and fundamentals of grammar necessary for everyday communication (listening and speaking | - | - |
| the Russian aiphac | a short text with marked stress, understand its contents and summarize it. |). Otaderits will be | able to read |
| 04XRZ2 | | Z | 2 |
| | Russian for Beginners Z2 ster of the programme is designed to teach skills for basic communication in everyday situations and for reading easy and short subtr | 1 | |
| | te using short sentences and appropriate structures, and read aloud with confidence a short text without marked stress. They will als | | |
| able to communica | master further grammatical structures. They will have mastered with confidence the Russian alphabet and will be able to use it in | = | abulal y allu |
| 04XRZ3 | | Z | 2 |
| - | Russian for Beginners Z3 d on RZ2 and includes further everyday topics, develops understanding of short compact texts on new subtechnical topics (for training | _ | _ |
| | d introduces new grammar. Students will be trained to distinguish intonation patterns while listening to spoken language. They will be | | _ |
| and listerling) and | understood, and to express their opinion. Writing skills will be trained on guided writing tasks and note-taking. | able to respond s | 3 43 10 50 |
| 04XRZ4 | Russian for Beginners Z4 | Z | 2 |
| | rkussian for beginners 24 d on RZ3. It improves and expands the knowledge of general language in all four skills (reading and understanding longer texts with a c | _ | |
| | | | |
| | iunication in evervoav situations, writing longer texts). Students are trained to use drammar structures effectively (e.g., irregular verbs | | |
| | unication in everyday situations, writing longer texts). Students are trained to use grammar structures effectively (e.g., irregular verbs dality, imperatives, conditionals). They practice and develop communication skills for everyday situations (food, travelling, free time), a | s, differences in ve | b patterns |
| from Czech, mod | dality, imperatives, conditionals). They practice and develop communication skills for everyday situations (food, travelling, free time), a | s, differences in ver and practice oral ar | b patterns nd written |
| from Czech, mod | dality, imperatives, conditionals). They practice and develop communication skills for everyday situations (food, travelling, free time), a n more specific topics (environment, addictions, the green movement). They become acquainted with various geographical data (e.g. | s, differences in ver and practice oral ar | b patterns nd written |
| from Czech, mod communication o | dality, imperatives, conditionals). They practice and develop communication skills for everyday situations (food, travelling, free time), a n more specific topics (environment, addictions, the green movement). They become acquainted with various geographical data (e.g forms, look up the information from the timetable, learn about Russian holidays and typical meals. | s, differences in ver and practice oral ar ., Siberia), learn ho | b patterns nd written ow to fill in |
| from Czech, mod communication o | dality, imperatives, conditionals). They practice and develop communication skills for everyday situations (food, travelling, free time), an more specific topics (environment, addictions, the green movement). They become acquainted with various geographical data (e.g forms, look up the information from the timetable, learn about Russian holidays and typical meals. Russian for Beginners Z5 | s, differences in ver and practice oral ar ., Siberia), learn ho | b patterns nd written ow to fill in |
| from Czech, mod communication of 04XRZ5 The course expects | dality, imperatives, conditionals). They practice and develop communication skills for everyday situations (food, travelling, free time), an more specific topics (environment, addictions, the green movement). They become acquainted with various geographical data (e.g forms, look up the information from the timetable, learn about Russian holidays and typical meals. Russian for Beginners Z5 sithe student to have completed RZ4. It concentrates predominantly on reading skills (working with professional texts, i.e. understanding). | s, differences in verand practice oral ar ., Siberia), learn ho | b patterns and written bow to fill in 2 ummarizing |
| from Czech, mod communication of 04XRZ5 The course expects information from a significant course | dality, imperatives, conditionals). They practice and develop communication skills for everyday situations (food, travelling, free time), an more specific topics (environment, addictions, the green movement). They become acquainted with various geographical data (e.g. forms, look up the information from the timetable, learn about Russian holidays and typical meals. Russian for Beginners Z5 s the student to have completed RZ4. It concentrates predominantly on reading skills (working with professional texts, i.e. understandir specialized text) and speaking, and to a certain extent, writing about the professional information obtained by reading the texts. Communication of the standard of the sta | s, differences in verand practice oral ara., Siberia), learn horal Z | b patterns and written by to fill in 2 ummarizing e trained on |
| from Czech, mod communication of 04XRZ5 The course expects information from a severyday topics. S | dality, imperatives, conditionals). They practice and develop communication skills for everyday situations (food, travelling, free time), an more specific topics (environment, addictions, the green movement). They become acquainted with various geographical data (e.g forms, look up the information from the timetable, learn about Russian holidays and typical meals. Russian for Beginners Z5 sithe student to have completed RZ4. It concentrates predominantly on reading skills (working with professional texts, i.e. understanding). | s, differences in versand practice oral arm., Siberia), learn hour Z ng, extracting and s munication skills ar (verbal adjectives, | b patterns and written by to fill in 2 ummarizing e trained on |
| from Czech, mod communication of 04XRZ5 The course expects information from a severyday topics. Severyday topics. Severyday topics. | dality, imperatives, conditionals). They practice and develop communication skills for everyday situations (food, travelling, free time), an more specific topics (environment, addictions, the green movement). They become acquainted with various geographical data (e.g. forms, look up the information from the timetable, learn about Russian holidays and typical meals. Russian for Beginners Z5 Is the student to have completed RZ4. It concentrates predominantly on reading skills (working with professional texts, i.e. understanding specialized text) and speaking, and to a certain extent, writing about the professional information obtained by reading the texts. Communication of the concentration of | s, differences in versand practice oral arm., Siberia), learn hour Z ng, extracting and s munication skills ar (verbal adjectives, | b patterns and written by to fill in 2 ummarizing e trained on participles, |
| from Czech, mod communication of 04XRZ5 The course expects information from a severyday topics. Severy | dality, imperatives, conditionals). They practice and develop communication skills for everyday situations (food, travelling, free time), a number of specific topics (environment, addictions, the green movement). They become acquainted with various geographical data (e.g. forms, look up the information from the timetable, learn about Russian holidays and typical meals. Russian for Beginners Z5 Is the student to have completed RZ4. It concentrates predominantly on reading skills (working with professional texts, i.e. understanding specialized text) and speaking, and to a certain extent, writing about the professional information obtained by reading the texts. Communication grammar is based on professional and technical texts and only includes items typically used in professional communication for evoice). Students develop their technical and economic vocabulary, and are also trained in some professional skills (writing a CV, por Russian for Beginners Examination | s, differences in versand practice oral arm, Siberia), learn horal zng, extracting and smunication skills ar (verbal adjectives, polite request, etc.) | b patterns and written ow to fill in 2 ummarizing e trained on participles, |
| from Czech, mod communication of 04XRZ5 The course expects information from a severyday topics. Severy | dality, imperatives, conditionals). They practice and develop communication skills for everyday situations (food, travelling, free time), an more specific topics (environment, addictions, the green movement). They become acquainted with various geographical data (e.g. forms, look up the information from the timetable, learn about Russian holidays and typical meals. Russian for Beginners Z5 Is the student to have completed RZ4. It concentrates predominantly on reading skills (working with professional texts, i.e. understanding specialized text) and speaking, and to a certain extent, writing about the professional information obtained by reading the texts. Communication of the concentration of | s, differences in version of practice oral arms, Siberia), learn hours, Siberia), learn hours, Siberia), learn hours, extracting and sometimes and simunication skills are (verbal adjectives, polite request, etc.) ZK dge and skills acquidates. | b patterns and written ow to fill in 2 ummarizing e trained on participles, 3 ired in RZ1 |
| from Czech, mod communication of 04XRZ5 The course expects information from a severyday topics. Severy | dality, imperatives, conditionals). They practice and develop communication skills for everyday situations (food, travelling, free time), an more specific topics (environment, addictions, the green movement). They become acquainted with various geographical data (e.g. forms, look up the information from the timetable, learn about Russian holidays and typical meals. Russian for Beginners Z5 The student to have completed RZ4. It concentrates predominantly on reading skills (working with professional texts, i.e. understanding specialized text) and speaking, and to a certain extent, writing about the professional information obtained by reading the texts. Communication of the voice of the students develop their technical and technical texts and only includes items typically used in professional communication of the voice). Students develop their technical and economic vocabulary, and are also trained in some professional skills (writing a CV, potential professional skills (writing a CV, potential professional skills (writing a CV) professional skills (| s, differences in version of practice oral arms, Siberia), learn hours, Siberia), learn hours, Siberia), learn hours, extracting and sometimes and simunication skills are (verbal adjectives, polite request, etc.) ZK dge and skills acquidates. | b patterns of written ow to fill in 2 ummarizing e trained on participles, 3 ired in RZ1 cher. |
| from Czech, mod communication of the course expects information from a severyday topics. Spassiv 04XRZZK The course contenture - RZ5. Studio 04XSM1 | dality, imperatives, conditionals). They practice and develop communication skills for everyday situations (food, travelling, free time), an more specific topics (environment, addictions, the green movement). They become acquainted with various geographical data (e.g. forms, look up the information from the timetable, learn about Russian holidays and typical meals. Russian for Beginners Z5 Is the student to have completed RZ4. It concentrates predominantly on reading skills (working with professional texts, i.e. understanding specialized text) and speaking, and to a certain extent, writing about the professional information obtained by reading the texts. Communication of the voice). Students develop their technical and economic vocabulary, and are also trained in some professional skills (writing a CV, possion for Beginners Examination It is the examination as given by the study plan. The course is completed by taking a written and oral examination. Students are given instructions are eligible for the oral examination only after a prior pass in RZ5 and a successful written examination. Students are given instructions. | s, differences in versand practice oral arm., Siberia), learn horal sides of the si | b patterns and written ow to fill in 2 ummarizing e trained on participles, 3 ired in RZ1 cher. |
| from Czech, mod communication of communication of 04XRZ5 The course expects information from a severyday topics. Severyd | dality, imperatives, conditionals). They practice and develop communication skills for everyday situations (food, travelling, free time), an more specific topics (environment, addictions, the green movement). They become acquainted with various geographical data (e.g. forms, look up the information from the timetable, learn about Russian holidays and typical meals. Russian for Beginners Z5 Is the student to have completed RZ4. It concentrates predominantly on reading skills (working with professional texts, i.e. understanding specialized text) and speaking, and to a certain extent, writing about the professional information obtained by reading the texts. Communication grammar is based on professional and technical texts and only includes items typically used in professional communication are voice). Students develop their technical and economic vocabulary, and are also trained in some professional skills (writing a CV, possional for Beginners Examination It is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowled ents are eligible for the oral examination only after a prior pass in RZ5 and a successful written examination. Students are given instructed in the secondary school. The 3-semesting of the students whose competence is at level B1 of CEFR, i.e. those who studied Spanish in the secondary school. The 3-semesting data for the contraction of the secondary school. The 3-semesting data for the contraction of the secondary school. The 3-semesting data for the contraction of the secondary school. The 3-semesting data for the contraction of the secondary school. The 3-semesting data for the contraction of the contracti | s, differences in versand practice oral arm., Siberia), learn horal sides and sides are considered and sides are course developes. | b patterns and written ow to fill in 2 ummarizing e trained on participles, 3 ired in RZ1 cher. 2 s standard |
| from Czech, mod communication of communication of the course expects information from a severyday topics. Spassiv 04XRZZK The course contenting - RZ5. Studio 04XSM1 The course is designed to the course is designed and pa | dality, imperatives, conditionals). They practice and develop communication skills for everyday situations (food, travelling, free time), an more specific topics (environment, addictions, the green movement). They become acquainted with various geographical data (e.g. forms, look up the information from the timetable, learn about Russian holidays and typical meals. Russian for Beginners Z5 Is the student to have completed RZ4. It concentrates predominantly on reading skills (working with professional texts, i.e. understanding specialized text) and speaking, and to a certain extent, writing about the professional information obtained by reading the texts. Communication grammar is based on professional and technical texts and only includes items typically used in professional communication are voice). Students develop their technical and economic vocabulary, and are also trained in some professional skills (writing a CV, possional for Beginners Examination Russian for Beginners Examination It is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowled ents are eligible for the oral examination only after a prior pass in RZ5 and a successful written examination. Students are given instructed in the secondary school. The 3-semestary attention to further grammar topics (e.g., perifrasis verbales, futuro imperfecto, direct object and indirect object pronouns, negative | s, differences in versand practice oral arm, Siberia), learn horal zero, siberia), learn horal zero, extracting and somunication skills are (verbal adjectives, oblite request, etc.) ZK dge and skills acquiructions by the tear | b patterns and written ow to fill in 2 ummarizing e trained on participles, 3 ired in RZ1 cher. 2 s standard rative, and |
| from Czech, mod communication of communication of the course expects information from a severyday topics. Severyday topi | dality, imperatives, conditionals). They practice and develop communication skills for everyday situations (food, travelling, free time), an more specific topics (environment, addictions, the green movement). They become acquainted with various geographical data (e.g. forms, look up the information from the timetable, learn about Russian holidays and typical meals. Russian for Beginners Z5 Is the student to have completed RZ4. It concentrates predominantly on reading skills (working with professional texts, i.e. understanding specialized text) and speaking, and to a certain extent, writing about the professional information obtained by reading the texts. Communication grammar is based on professional and technical texts and only includes items typically used in professional communication are voice). Students develop their technical and economic vocabulary, and are also trained in some professional skills (writing a CV, possional text). The course is completed by taking a written and oral examination testing the knowledgeness are eligible for the oral examination only after a prior pass in RZ5 and a successful written examination. Students are given instructed in the secondary school. The 3-semestays attention to further grammar topics (e.g., perifrasis verbales, futuro imperfecto, direct object and indirect object pronouns, negative), to written and oral communication on a given everyday or easy subtechnical topic, for which the students are trained by reading texts. | s, differences in versand practice oral arm, Siberia), learn how the practice oral arm, Siberia), learn how the practice oral arm, Siberia), learn how the practice of the pra | b patterns and written ow to fill in 2 ummarizing e trained on participles, 3 ired in RZ1 cher. 2 s standard rative, and nem. |
| from Czech, mod communication of communication of the course expects information from a severyday topics. Severyday topi | dality, imperatives, conditionals). They practice and develop communication skills for everyday situations (food, travelling, free time), an more specific topics (environment, addictions, the green movement). They become acquainted with various geographical data (e.g. forms, look up the information from the timetable, learn about Russian holidays and typical meals. Russian for Beginners Z5 Is the student to have completed RZ4. It concentrates predominantly on reading skills (working with professional texts, i.e. understanding specialized text) and speaking, and to a certain extent, writing about the professional information obtained by reading the texts. Completed by taking grammar is based on professional and technical texts and only includes items typically used in professional communication are voice). Students develop their technical and economic vocabulary, and are also trained in some professional skills (writing a CV, possional time texts are eligible for the oral examination only after a prior pass in RZ5 and a successful written and oral examination. Students are given instructed for students whose competence is at level B1 of CEFR, i.e. those who studied Spanish in the secondary school. The 3-semestays attention to further grammar topics (e.g., perifrasis verbales, futuro imperfecto, direct object and indirect object pronouns, negatively, to written and oral communication on a given everyday or easy subtechnical topic, for which the students are trained by reading texts. | s, differences in versand practice oral arm, Siberia), learn horal arm, extraction skills ard (verbal adjectives, olite request, etc.) ZK dge and skills acquiructions by the tead arm of the imperior of the imp | b patterns and written ow to fill in 2 ummarizing the trained on participles, 3 irred in RZ1 ther. 2 s standard rative, and them. 2 |
| from Czech, mod communication of communication of the course expects information from a severyday topics. Severyday topi | dality, imperatives, conditionals). They practice and develop communication skills for everyday situations (food, travelling, free time), an more specific topics (environment, addictions, the green movement). They become acquainted with various geographical data (e.g. forms, look up the information from the timetable, learn about Russian holidays and typical meals. Russian for Beginners Z5 Is the student to have completed RZ4. It concentrates predominantly on reading skills (working with professional texts, i.e. understanding specialized text) and speaking, and to a certain extent, writing about the professional information obtained by reading the texts. Completed by taking grammar is based on professional and technical texts and only includes items typically used in professional communication are voice). Students develop their technical and economic vocabulary, and are also trained in some professional skills (writing a CV, possional time texts are eligible for the oral examination only after a prior pass in RZ5 and a successful written and oral examination. Students are given instructed for students whose competence is at level B1 of CEFR, i.e. those who studied Spanish in the secondary school. The 3-semestary attention to further grammar topics (e.g., perifrasis verbales, futuro imperfecto, direct object and indirect object pronouns, negatively, to written and oral communication on a given everyday or easy subtechnical topic, for which the students are trained by reading texts. | s, differences in versand practice oral arm, Siberia), learn horal arm, extraction skills ard (verbal adjectives, olite request, etc.) ZK dge and skills acquiructions by the tead arm of the imperior of the imp | b patterns and written ow to fill in 2 ummarizing the trained on participles, 3 irred in RZ1 ther. 2 s standard rative, and them. 2 |
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| from Czech, mod communication of communication of communication of the course expects information from a severyday topics. Severyday topic | dality, imperatives, conditionals). They practice and develop communication skills for everyday situations (food, travelling, free time), an more specific topics (environment, addictions, the green movement). They become acquainted with various geographical data (e.g. forms, look up the information from the timetable, learn about Russian holidays and typical meals. Russian for Beginners Z5 In the student to have completed RZ4. It concentrates predominantly on reading skills (working with professional texts, i.e. understanding specialized text) and speaking, and to a certain extent, writing about the professional information obtained by reading the texts. Communication grammar is based on professional and technical texts and only includes items typically used in professional communication are voice). Students develop their technical and economic vocabulary, and are also trained in some professional skills (writing a CV, por Russian for Beginners Examination In the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowledgents are eligible for the oral examination only after a prior pass in RZ5 and a successful written examination. Students are given instructed for students whose competence is at level B1 of CEFR, i.e. those who studied Spanish in the secondary school. The 3-semestary attention to further grammar topics (e.g., perifrasis verbales, futuro imperfecto, direct object and indirect object pronouns, negative), to written and oral communication on a given everyday or easy subtechnical topic, for which the students are trained by reading texts are supplemented with shoulded from the previous course (SM1). Students are gradually acquainted with fundamentals of Spanish for spanish for Intermediate Students M3 The students with additional subtechnical materials, so the students will be gradually acquainted with the peculiarities of academs are supplemented with additional subtechnical materials, so the students will be gradually acquainte | s, differences in versand practice oral arm, Siberia), learn horal arm, skills arm, (verbal adjectives, olite request, etc.) ZK dge and skills acquiructions by the tead of the imperior of the i | b patterns and written ow to fill in 2 ummarizing the trained on participles, 3 ired in RZ1 ther. 2 s standard rative, and them. 2 order to be 2 e competent |
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| 04XSP3 Spanish for Advanced Students P3 | Z | 2 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------|
| Course SP3 is the final part of the advanced Spanish course. It is based on texts chosen by the students according to their future specialization. It is focu | sed on written com | nmunication |
| based on what students will need in their career. | | |
| 04XSPZK Spanish for Advanced Students Examination | ZK | 4 |
| The course content is the examination as given by the study plan. Examination SPZK consists of two parts, namely oral and written. The prerequisite for a | dmission to oral pa | art is having |
| passed the written test. Examination content is based on syllabi of courses SP1, SP2, and SP3 or on an individual study plan of the | student. | |
| 04XSZ1 Spanish for Beginners Z1 | Z | 2 |
| Course SZ1 is the first stage of the five-semester programme of Spanish studies; during the first stage the students will master phonetics and fundament | al grammar structu | res and will |
| be able to communicate at an elementary level on topics of everyday life. They will acquire and extend fundamental vocabulary of general Spani | sh and will develor | o it. |
| 04XSZ2 Spanish for Beginners Students Z2 | Z | 2 |
| Course SZ2 is based on course SZ1, and expects students to develop and extend the knowledge and skills acquired so far. Grammar structures and lexis | will be chosen so a | as to enable |
| them to understand short adapted written texts and speech. Attention is also paid to cultural differences between Spanish-speaking countries and others | s such as the Czec | h Republic. |
| Realia of Spanish-speaking countries are also included. | | |
| 04XSZ3 Spanish for Beginners Z3 | Z | 2 |
| The course is based on course SZ2, and develops the student's vocabulary and grammar structure. The course covers realia (history and culture) of the | ອ Spanish-speakinເ | g countries, |
| mainly of Spain. It pays attention to further grammar topics (pretérito perfecto, pretérito indefinido, pretérito imperfecto, the gerund and the imperative) | . It includes written | and oral |
| communication on a given general topic, for which the student is trained by reading texts or listening to them. | | |
| 04XSZ4 Spanish for Beginners Z4 | Z | 2 |
| The course is based on course SZ3. It develops the student's vocabulary and extends the knowledge of the culture and social customs of the Spanish | - | = |
| Spain. It pays attention to further grammar topics (perífrasis verbales, futuro imperfecto, direct object and indirect object pronouns, negative form of the | - | ıbjunctive), |
| to written and oral communication on a given general or subtechnical topic, for which the student is trained by reading texts or listenir | | |
| 04XSZ5 Spanish for Beginners Z5 | Z | 2 |
| The course books are supplemented with additional subtechnical materials, so the students will be gradually acquainted with peculiarities of Spanish fo | | s. In its final |
| part, the general Spanish course based on the course book will end with presentations and, finally, a written and oral examina | | |
| 04XSZZK Spanish for Beginners Examination | ZK | 3 |
| The course content is the examination as given by the study plan. Examination consists of two parts - written and oral. Student can register for oral examination | amination only if he | e/she has |
| passed the written examination test. | | |
| 12NME1 Numerical Methods 1 | Z,ZK | 4 |
| There are explained the basic principles of numerical mathematics important for numerical solving of problems important for physics and technology. Met | | |
| important for physicists (ordinary differential equations, random numbers) are included in addition to the basic numerical methods. Integrated computation | onal environment I | MATLAB is |
| used as a principle programming language as a demonstration tool. The seminars are held in computer laboratory. | | |
| 12UNXAP Introduction to UNIX | Z | 2 |
| Computer and operating systems. Personal computer, workstation and supercomputers. Processor, memory, bus, devices, hard disk, network interface | | |
| Principles of operating systems. Operating system UNIX. Basic principles, kernel, kernel services. Documentation. File system, file atributes, working with | | |
| Command interpreter (shell) bash and its programming (scripts). Controlling processes, process status, computer load a process priorities. Standard to | | |
| X-windows. Computer networks. Local computer networks. Global computer networks. Addresses and protocols TCP/IP. Network configuration of a computer networks. Addresses and protocols TCP/IP. Network configuration of a computer networks. | omputer. Network s | services: |
| hardware sharing, mail, scp, etc. Network applications 12UPF1 Introduction to Computational Physics 1 | 7.71/ | 2 |
| 12UPF1 Introduction to Computational Physics 1 Numerical simulation and its role in physics, methodology of writing computer codes. Computer languages for physics. Numerical libraries and program | Z,ZK | 2 Computer |
| tools for scientific visualization. Computational fluid dynamics, hydrodynamic simulations, methods for discretization of Euler equations. High-performance | | - |
| software for parallel simulations. Databases of scientific information, scientist evaluation, citation analysis. | computing, paraller | computing, |
| 12UPF2 Introduction to Computational Physics 2 | Z,ZK | 2 |
| Nonlinear models, complex systems, chaotic systems, fractals and their applications in physics. Artificial intelligence methods: neural networks, machine | | |
| expert systems and their applications in physics. Quantum computing. Virtual reality. | , learning, genetic | aigoniinis, |
| | Z | 2 |
| 12UVP Introduction to Scientific Computing Practically oriented Introduction to scientific computing. Constituent part of the course is realized in computer classroom. Students get acquinted with sr | | |
| and technicval computing, data analysis, data visualisation and algorithm development. | Jille basic tools for | t Scientific |
| 12ZEL1 Basic Electronics 1 | Z,ZK | 3 |
| The subject provides primary knowledge of circuit theory concerning principles of electronic circuits in both stationary and harmonic stable state. Circu | · ' | |
| circuits include symbolic and complex method are explained. Proper circuit analysis is also lectured. The subject's final part deals with transient effective analysis. | • | |
| 12ZEL2 Basic Electronics 2 | Z,ZK | 3 |
| The subject follows up with the Basic Electronics 1. Semiconductor elements basic properties are explained. Thecourse's final part deals with basic the | | |
| | 7 | 3 |
| 15CH1 General Chemistry 1 The most important concepts, quantities and units used in chemistry are introduced in the course General Chemistry I. Their significance and practical u | L L | _ |
| solved in exercises. | se are mustrated b | у ехапірієз |
| 15CH2 General Chemistry 2 | Z,ZK | 3 |
| The subject is the continuation of the course General chemistry I. The main attention is paid to general principles governing chemical processes. Using v | | _ |
| the validity of these principles is not restricted only to chemical processes is documented. The significance and practical use of explained principles are | - | |
| in exercises. | | - 100 001VEU |
| 16DETE Detectors of Ionizing Radiation | ZK | 4 |
| Gas filled detectors (ionization chambers, proportional counters, Geiger-Müller counters, corona counters), organic and inorganic scintillation detectors, C | | |
| of light by photomultiplier, parameters of PMT, semiconductor detectors, cryogenic detectors. | noronnov odanioro | , ovaluation |
| 16EPAM Exact Methods in Research of Historic Monuments | ZK | 2 |
| Aims and methods of historic monument investigations, methods of age determination (radiocarbon, thermoluminescence and related methods, further radiation) | | |
| archaeomagnetism), analytical methods for determination of origin and production technologies of artefacts (activation analysis, X-ray fluorescence are | | |
| photogrammetry. | , | ,, |
| 16EXK Excursion | Z | 2 |
| Excursion in research institutes, laboratories and cooperative universities(CERN, JINR, TU Dresden,) and modern research trends usig in | | _ |
| 16KPR Clinical Propaedeutic | ZK | 2 |
| Making students familiar with the basics of anamnesis, physical examination, examinational methods of different organs, hematological and biochemical | | |
| g and an analysis of an analys | | u |

160SE Professional Seminar In the first part of the seminar, students familiarize themselves with the general principles of publishing and presenting scientific work and the formal requirements for bachelors degree projects at the faculty. The second part is designed as a practical training for the defence of the bachelors degree project. The students give oral presentations of the current state of the research results achieved during the work on their projects. Each presentation is followed by a discussion on scientific matters as well as on the possibilities of improving the students performance. Third part of the seminar deals with topical questions on nuclear and radiation physics, dosimetry, detectors of ionizing radiation, and radiation protection with focus on bachelor state final exams. Ph.D. students and academic staff lead this topical discussion with students about given questions and tries to help the students to accommodate learned knowledge form their studies in complex frame for application in practice. 16PADR Practical Analysis of Data and Risks The aim of the course is to provide students with a summary of basic theoretical knowledge, especially in the field of probability and statistics, useful for data and risk analysis. The main content of the course is practical application of theoretical procedures, especially data analysis using available software solution. Students will learn to perform comprehensive analysis and evaluation of data and risks. Problems of Non-ionizing Radiation 16PNZ ΚZ 2 Subject is focused on biological effects of non-ionizing radiation and its use in physical praxis. Information about principles, biological effects and methods used in fields of magnetic resonance and ultrasound as applied in various types of technical or medical equipment are given as well. Topical Dosimetry Seminar The seminary is supposed to motivate the students interest in the field of dosimetry and provide basic information about different applications of ionizing radiation in science, in research and in human life. The lectures are given by students and absolvents of DDAIR, who are currently employed at the department or in various organizations (SÚRO, v.v.i., ÚJF AV R v.v.i., ÚJV ež, MI, Hospital Na Homolce, FN v Motole, PTC Czech s.r.o., CERN, Fermilab). The lectures will focus not only on describing research and current topics in the field of dosimetry, but students will also learn more about Bachelor degree thesis topics and thus will learn more about their possible specialization during the studies and afterwards. 16RAON Radiation Protection ZK 4 The course covers the basic principles of radiation protection. It describes not only the current approaches but also points to future developments. The course is accepted as training, which allows obtaining special competence in radiation protection and learner receives appropriate certificate. 16RAZP Radioactivity in the Environment The course provides a comprehensive view of the source of ionizing radiation occurring in the environment. 16UAZB ZK Principles of Ionizing-Radiation Applications 2 Historical outline of applications, review of interaction of radiation with a matter, radiation sources, detectors and instrumentation, evaluation of radionuclide measurements, use of penetration and scattering of radiation beams, selected radioanalytical methods, tracer methods, radionuclide dating, further possibilities for the use of ionizing radiation. 16UJRF1 Introductory Nuclear and Radiation Physics 1 The aim of the course is to provide students with basic knowledge about atomic nucleus and radiation physics, which is followed by other specialized lectures. The subject summarizes thematic areas: development of opinions on micro-wave and radiation physics, basic characteristics of the atom and nucleus, binding energy, measurement of mass and dimensions of the nuclei, the most important nuclear models. General characteristics of the interaction of ionizing radiation with the matter, interaction of alpha, beta, gamma and neutron radiation, passage of radiation beams through the matter, radiation effects in matter. 16UJRF2 Z.ZK Introductory Nuclear and Radiation Physics 2 The aim of the course is to provide students with basic knowledge about atomic nucleus and radiation physics, which is followed by other specialized lectures. The subject summarizes thematic areas: general properties of radioactive decay, alpha decay, proton radioactivity, beta decay, gamma emission, natural radioactivity, properties and types of nuclear reactions, nuclear fission, transuranium elements, thermonuclear reaction. 16UVJZ Introduction to Decommissioning of Nuclear Facilities Z,ZK The course aims to familiarise students with the actual decommissioning process. The syllabus of the subject is built in the sense of the actual course of the preparation and realization of the decommissioning project. It includes implementation of site decommissioning including legislative requirements to protect employees and the environment against radiation and waste management in their categorization, transport, release to the environment and disposal. It deals with documentation and centralization of monitoring systems. 16ZDOZ1 Fundamentals of Radiation Dosimetry 1 History, development, and objectives of dosimetry. Quantities and units used for description of sources, fields, interactions of ionizing radiation, ionizations, energy transfer and absorption. Fundamentals of the effects of ionizing radiation. 16ZDOZ2N Fundamentals of Radiation Dosimetry 2 4 Fundamentals of biological effects of ionizing radiation. Quantities and units used in radiation protection. Recommendations of ICRP and ICRU. Principles and methods of measurements in dosimetry. Determination of activity and neutron source emission. Measurements of absorbed dose and exposure. 16ZIVB Introduction to Ecology ΚZ 2 The subject inform about basic of the ecologic principles, terms and ideas. It covers overview information regarding to particular components of the environment and evaluate economic indicators and sustainable development. 16ZOZ K7 Sources of Irradiation and Environment The subject provides an overview of the usage of ionizing radiation from its discovery and first applications to modern methods. It allows the student to acquire the basic knowledge about ionizing radiation usage. The subject deals with the fundamental issues related to ionizing radiation and the safety of dealing with the sources of IR. The course includes practical exercises with processing the data and subsequent presentation of the results. 16ZPRD ΚZ Elementary Labs 3 The aim of the course is to acquaint students with applications of ionizing radiation detectors and also with the principles of detection and spectrometry of ionizing radiation. Ionizing radiation detectors in this course is considered as a device which produces an evaluable signal at the time of interaction (unlike dosimeters). The aim of the course is to understand to basic principles of detection and calibration of common instruments in the field of ionizing radiation measurement. 16ZPSP Basic Work with PC 7 2 The aim of the course is to acquaint students with the basic skills related to working on a personal computer. The introductory part of the course is devoted to information systems and resources available at the CTU in Prague and the FNSPE. Emphasis is placed on effective handling of work with office productivity software (text editor, spreadsheet and presentation software) with exercises in MS Office. The practical content focuses mainly on further use during studies (laboratory reports, research work, bachelor's and diploma theses) and in specific practice (hospitals, state administration, companies). Other sections summarize basic information about computer hardware, software, and security. Completion of independent home exercises and participation in exercises above 60% is a necessary condition for passing the course. 16ZRAO **Basics of Radiation Protection** The aim of the course is to familiarize students with the general principles of radiation protection. The main emphasis is put on basic mechanisms and concepts, in order to allow critical orientation in this field. The course provides answers to the cardinal questions: What is ionizing radiation (IR), where it comes from, whether and how it is dangerous for people, what is the meaning of protective units (Gray, Sievert), how to prevent malicious effect of IR and many others. The content of the lectures does not require any prior knowledge. 16ZRIZ Health risks of ionizing radiation The aim of the course is to acquaint students with the radiobiological basics of radiation protection. The basis of the course is an introduction to the biological effects of ionizing radiation (IR) at the molecular, cellular and tissue levels, an overview of deterministic and stochastic effects of ionizing radiation, health harm, risk and its evaluation, basics of epidemiology.

| 17BPJI1 | Bachelor Thesis 1 | Z | 5 |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|
| | sis of theses assignment and under leading of a supervisor individually processes given topic during 2 semesters. The subject is give | n by self-reliant w | ork on given |
| | topic. The work is continuously check by a supervisor. | | |
| 17BPJI2 | Bachelor Thesis 2 | Z | 10 |
| Student on the ba | sis of theses assignment and under leading of a supervisor individually processes given topic during 2 semesters. The subject is give | n by self-reliant w | ork on given |
| | topic. The work is continuously check by a supervisor. | | |
| 17BPROV | Safe operation of nuclear facilities | KZ | 2 |
| | The aim of the subject is to familiarize students with basic principles of nuclear safety. | | _ |
| 17ENEF | Experimental Neutron Physics | KZ | 3 |
| | sed on experimental methods and experiments in the field of neutron physics, mainly using radionuclide neutron sources. The lectures | | |
| • | or preparation and realization of the laboratory exercises and to the methods of experimental data processing and evaluation. Specificall | | |
| • | ron properties and their utilization, the characteristics of neutron sources, properties of prompt and delayed neutrons, selected method: | | |
| | ances, production, formation and modification of neutron fields and neutron beams. The lectures are complemented by the laboratory e urement of delayed neutrons, study of neutron transport in various substances, experiments with various neutron sources (252Cf, Am | | |
| | d detection of photo-neutron source, calibration of the radionuclide neutron source. The experiments are realized at the VR-1 training r | | - |
| 17JARE | Nuclear Reactors | ZK | 2 |
| - | I power issue. Previous evolution of power reactor. Nuclear fission reactors, fuel assemblies, active core, control systems, safety system | | _ |
| | generations. Standard types of nuclear power reactors: concept, description, layout, previous evolution, world share, perspectives. Pres | | |
| | PWR (Westinghouse, KWU, Framatom). VVER-type reactors, Temelin nuclear power plant. Boiling water reactors. Heavy water react | | , , |
| | gas cooled reactors. Second nuclear era. reactors of generation III (EPR, AP-1000, VVER 1200). Reactors of generation IV: GIF and | | |
| | selection of proposed systems. Six selected concepts. ICRP scenarios of word evolution, hydrogen power, role of nuclear power in lo | | |
| 17UING | Introduction to Engineering | KZ | 3 |
| | des introduction to engineering skills. Students should gain general engineering skills at basic level (e.g. material properties and beha | vior, basics of ma | anufacturing |
| | and production, quality assurance, environmental impacts,). In addition, the introduction to scientific work and technical drawing will be | e included. | |
| 18PMTL | Programming in MATLAB | KZ | 4 |
| Introducing Matla | b environment as efficient tool for computation in complex arrays and symbolic variables, namely for linear algebra, mathematic analysis | sis, statistics, algo | orithmization |
| | and geometric representation of results. | | |
| 18PRC1 | Programming in C++ 1 | Z | 4 |
| | This course covers mainly the C programming language and non-object oriented features of the C++ language. | | ' |
| 18PRC2 | Programming in C++ 2 | KZ | 4 |
| | course covers the object oriented programming and othesr advanced constructs in the C+;+ programming language and the Standard | Template Library | .' |
| 18ZALG | Basics of Algorithmization | Z,ZK | 4 |
| This course i | s devoted to selected algorithms and methods for algorithm design. This course intruduces selected methods for the determination of | the algorithm cor | nplexity. |
| 18ZPRO | Basics of Programming | Z | 4 |
| This course is | intended mainly for students with little or no experience in programming. It familiarizes the students with the basic concepts in program | nming and with th | ne Python |
| | programming language. | _ | • |
| TV-1 | Physical Education | Z | 1 |
| TV-2 | Physical Education | Z | 1 |
| | · | | |
| I V3 | Physical education | 7 | 1 |
| TV-3 TV-4 | Physical education Physical education | Z | 1 1 |

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