

Study plan

Name of study plan: 02 26 31 34 BSTR EPT 2012 P základ

Faculty/Institute/Others:

Department:

Branch of study guaranteed by the department: Welcome page

Garantor of the study branch:

Program of study: Welcome page

Type of study: unknown full-time

Required credits: 279

Elective courses credits: -36

Sum of credits in the plan: 243

Note on the plan: export 03

Name of the block: Compulsory courses in the program

Minimal number of credits of the block: 202

The role of the block: P

Code of the group: 12B*P*P-TV

Name of the group: 07 2012 bakalářský teoretický

Requirement credits in the group: In this group you have to gain 3 credits

Requirement courses in the group: In this group you have to complete 3 courses

Credits in the group: 3

Note on the group: Letní výcvikový kurz je předmět povinný. Student jej může vykonat kdykoliv v průběhu studia, avšak v souladu s příslušnými ustanoveními Ústavu tělesné výchovy a sportu ČVUT

Code of the group: 12B*P*P-ZT21

Name of the group: 04 2012 prezenční ZT v podí 21

Requirement credits in the group: In this group you have to gain 6 credits

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

Credits in the group: 6

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) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
2333038	Fundamentals of Technology I.	Z	3	1P+1C	*	P

Characteristics of the courses of this group of Study Plan: Code=12B*P*P-ZT21 Name=04 2012 prezenční ZT v podí 21

2333038	Fundamentals of Technology I.	Z	3
Production processes in engineering production. Technology of engineering production. Materials in engineering. Concepts of steel and cast iron, technical metals. Production of pig iron and steel. Casting: modeling devices, molding materials, molding and castings. Foundry alloys. Overview of basic casting technology. Forming technology. Hot and cold forging. Free and drop forging. Rolling. Production of pipes. Bulk and sheet metal forming. Welding technology. The characteristics of the various types of welding. Fusion welding: Flame welding and arc welding with coated electrodes. Thermal cutting.			

Code of the group: 12B-KMENP TZI STR

Name of the group: 01 2012 souhrnná skupina 12B*PiP-KMEN pro I. od 1 do 6

Requirement credits in the group: In this group you have to gain 156 credits

Requirement courses in the group: In this group you have to complete 37 courses

Credits in the group: 156

Note on the group: Společné povinné předměty bakalářských programů STR a TZSI

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
2371047	Automatic Control <i>Milan Hofreiter, R žena Petrová, Tomáš Vyhřídál, Jaromír Fišer Tomáš Vyhřídál Tomáš Vyhřídál (Gar.)</i>	Z,ZK	5	3P+1C	*	P
2182019	Chemistry <i>Radek Šulc, Martin Dostál, Vojtěch B lohlav, Stanislav Solna, Jan Skořilas Radek Šulc Radek Šulc (Gar.)</i>	KZ	3	2P+1C	1	P
2131512	Machine Elements and Mechanisms I. <i>František Lopot</i>	Z,ZK	6	3P+2C	*	P
2131026	Machine Elements and Mechanisms II <i>Eliška Cézová, Zdeněk ešpíro, Martin Dub, Jan Flek, Jiří Houkal, Jan Kanaval, František Lopot, Karel Petr František Lopot František Lopot (Gar.)</i>	ZK	3	3P+0C	*	P
2141504	Electric Circuits and Electronics <i>Stanislava Papežová, Jan Chyský, Jaroslav Novák, Lukáš Novák Zuzana Sedlecká Jan Chyský (Gar.)</i>	Z,ZK	4	2P+0C+1L	*	P
2141505	Electrical machines and drives <i>Jan Chyský, Jaroslav Novák, Lukáš Novák Jaroslav Novák Jaroslav Novák (Gar.)</i>	Z,ZK	4	2P+0C+1L	*	P
2021041	Physics I.	Z,ZK	7	4P+1L	*	P
2021025	Physics II.	Z,ZK	4	1P+2L	3	P
2133025	Design <i>František Lopot František Lopot František Lopot (Gar.)</i>	Z	4	0P+4C	*	P
2011021	Constructive Geometry <i>Ivana Linkeová</i>	Z,ZK	6	3P+2C	*	P
2381054	Management and Economics of the Enterprise <i>Theodor Beran, Štěpánka Uhlířná, Vladimír Brdek, Ladislav Vaniš, Petr Žemlička Theodor Beran Theodor Beran (Gar.)</i>	Z,ZK	4	2P+2C	*	P
2011056	Mathematics I <i>Radka Keslerová, Marta Hlavová, Jiří Holman, Gejza Dohnal, Marta Bertíková, Vladimír Hric, Nikola Pajerová, Petr Louda, Lukáš Hájek, Radka Keslerová Gejza Dohnal (Gar.)</i>	Z,ZK	8	4P+4C	*	P
2011062	Matematika II. <i>Radka Keslerová</i>	Z,ZK	8	4P+4C	*	P
2011009	Mathematics III <i>Radka Keslerová, Jiří Holman, Gejza Dohnal, Marta Bertíková, Vladimír Hric, Jan Valášek, Luděk Beneš, Tomáš Bodnár, Tomáš Neustupa, Stanislav Kraus Stanislav Kraus (Gar.)</i>	Z,ZK	5	2P+2C	*	P
2311101	Mechanics I. <i>Pavel Bastl, Václav Bauma, Petr Beneš, Ivo Bukovský, Martin Nečas, Zdeněk Neusser, Jan Pelikán, Pavel Steinbauer, Zbyněk Šíka, Zbyněk Šíka Zbyněk Šíka (Gar.)</i>	Z,ZK	4	2P+2C	*	P
2311102	Mechanics II. <i>Pavel Bastl, Václav Bauma, Petr Beneš, Ivo Bukovský, Martin Nečas, Zdeněk Neusser, Jan Pelikán, Pavel Steinbauer, Zbyněk Šíka, Václav Bauma Václav Bauma (Gar.)</i>	Z,ZK	4	2P+2C	*	P
2322029	Materials Science I. <i>Jana Sobotová, Eliška Galíková, Jiří Cejp, Pavlína Hájková, Jan Král, Vladimír Mára, Lucie Pilsová, Tana Vacková Jana Sobotová Jana Sobotová (Gar.)</i>	KZ	3	2P+1L	2	P
2321039	Materials Science II. <i>Jana Sobotová, Eliška Galíková, Jiří Cejp, Pavlína Hájková, Jan Král, Vladimír Mára, Lucie Pilsová, Tana Vacková, Jan Walter, Jana Sobotová Jana Sobotová (Gar.)</i>	Z,ZK	4	2P+2L	*	P
2011049	Numerical Mathematics <i>Radka Keslerová, Jiří Holman, Marta Bertíková, Vladimír Hric, Petr Louda, Lukáš Hájek, Jan Valášek, Luděk Beneš, Tomáš Bodnár, Petr Svátek Petr Svátek (Gar.)</i>	Z,ZK	4	2P+2C	4	P
2012037	Computer Graphics <i>Marta Hlavová, Jiří Holman, Nikola Pajerová, Martin Hanek, Jan Karel, Ivana Linkeová, Jaroslav Cibulka Ivana Linkeová Ivana Linkeová (Gar.)</i>	KZ	3	1P+1C	*	P
2372041	Computer Support for Study <i>Vladimír Hlavá</i>	KZ	3	1P+1C	*	P
2181026	Momentum, Mass and Heat Transfer <i>Martin Dostál, Vojtěch B lohlav, Stanislav Solna, Jan Skořilas, Tomáš Jirout, Adam Krupica, Jiří Moravec Tomáš Jirout Tomáš Jirout (Gar.)</i>	Z,ZK	5	3P+1C	*	P
2131002	Engineering Design II <i>Eliška Cézová, Martin Dub, Jan Flek, Jan Kanaval, František Lopot, Karel Petr, Martin Havlíček, Jan Hoidekr, Roman Uhlíř Karel Petr Karel Petr (Gar.)</i>	Z,ZK	4	2P+3C	2	P
2133013	Engineering Design III. <i>Jan Kanaval, František Lopot, Jan Hoidekr, David Skalický, Roman Uhlíř Jan Kanaval Jan Kanaval (Gar.)</i>	Z	2	0P+2C	Z	P
2133014	Engineering Design IV. <i>František Lopot František Lopot František Lopot (Gar.)</i>	Z	2	0P+2C	L	P
2372083	Measurement in Engineering <i>Martin Novák, Vladimír Hlavá Martin Novák Martin Novák (Gar.)</i>	KZ	3	1P+0C+2L	*	P
2331068	Technology I.	Z,ZK	5	2P+2C	*	P

2341014	Technology II.	Z,ZK	5	2P+0C+2L	*	P
2012035	Algorithmization and Programming Fundamentals <i>Jiří Holman, Marta Čertíková, Vladimír Hric, Lukáš Hájek, Jan Halama, Vladimír Prokop, Martin Hanek, Jan Karel, Josef Musil, Petr Svátek Petr Svátek (Gar.)</i>	KZ	4	1P+2C	*	P
2153005	Fundamentals of Energy Conversions	Z	1	1P+1C	*	P
2383001	Fundamentals of Law <i>Václav Pilík Václav Pilík (Gar.)</i>	Z	2	1P+1C	*	P

Characteristics of the courses of this group of Study Plan: Code=12B-KMENP TZI STR Name=01 2012 souhrn skupin 12B*PiP-KMEN pro i od 1 do 6

2371047	Automatic Control Automatic controllers are important part of many industrial processes. The goal of this course is to introduce students into basic knowledge of automatic control theory and practice like transfer functions, open versus closed loop control, design of controllers and frequency based analysis of control systems. The course also concentrates on logic control and control via programmable logic controllers. Some seminars are devoted to practical individual solution of simple design projects - tasks with motion screws, preloaded connecting bolts, clamped, pressed, splined and key joints between shafts and hubs and tasks with welded and riveted joints. Sketching of machine elements and their simple assembly units is also indispensable seminar work.	Z,ZK	5
2182019	Chemistry General chemistry from the point of view of mechanical and process engineering. Physical chemistry forms 2/3 of the course (structure and properties of matter, thermodynamics, phase equilibrium, chemical reactions, reaction engineering), the remaining 1/3 is devoted to organic chemistry (hydrocarbons, polymers) and biochemistry. Laboratory practice is oriented upon the material properties measurement.	KZ	3
2131512	Machine Elements and Mechanisms I. Joints and joining elements (screwed, clamped, splined, welded, riveted, soldered and adhesive joints; joints with use of feathers, pins, tenons, cotters, keys). Mechanical transmissions (belt, chain, friction, gear drives). Seminars are devoted to practical individual solution of simple design projects - tasks with motion screws, preloaded connecting bolts, clamped, pressed, splined and key joints between shafts and hubs and tasks with welded and riveted joints. Sketching of machine elements and their simple assembly units is also indispensable seminar work.	Z,ZK	6
2131026	Machine Elements and Mechanisms II Preliminary design, design calculations and application of axles and shafts, sliding and rolling bearings, shaft connections, elements of crank mechanism, pipelines and their accessories and fittings.	ZK	3
2141504	Electric Circuits and Electronics Introduction into theory of electrical circuits, analysis special types of electrical circuits as DC and AC. Transient states in circuits with accumulators of energy. El. Power and Energy. Introduction into electronics. Principle and typical parameters of basic semiconductor components. Application in electronic circuits (rectifier, stabilizer, power control, operational amplifier). Analogue and digital circuits. Principle of analogue and digital signal processing. Logical circuits, converters, microprocessor.	Z,ZK	4
2141505	Electrical machines and drives AC el. circuits. Electrical power and energy. Calculation, measurement, power factor. Magnetic circuit, materials, hysteresis loop. Electromagnet. Transformer, principle, construction, 3-phase transformer, operating conditions, rated (scheduled) values. Induction machine, principle, construction, operating conditions. Starting, speed-torque characteristic, speed control. Synchronous machines. DC-machines, principle, parameters, operating conditions, construction, starting, speed control, speed-torque characteristic. Low-voltage instruments. Low-voltage distribution system.	Z,ZK	4
2021041	Physics I. Kinematics and dynamics of a particle motion. Principle of conservation of energy. System of particles, centre of mass. Rigid body. Continuum, elastic properties of bodies. Oscillations, waves. Fluid mechanics. Temperature and heat transfer. Kinetic theory of gases. Thermodynamics. Electric field, current, conductivity, resistance. Conductors, semiconductors, insulators. Magnetic field. Magnetic materials. Laboratories - accuracy of measurements, systematic and random errors, uncertainty of direct and indirect measurements, regression, measurements of 11 various experiments related to the lectures.	Z,ZK	7
2021025	Physics II. Faraday's law of electromagnetic induction. Maxwell's equations, electromagnetic waves. Light, wave optics, geometrical optics. Quantum properties of electromagnetic waves. Interaction of radiation with matter. Photoelectric effect. Wave-particle nature of matter. Quantum-mechanical description of particle's motion. Hydrogen atom and periodic system of elements. Spectra, x-rays, laser. Band theory of solids, semiconductors. Nucleus, radioactivity, sources of nuclear energy. Laboratories - measurements of 6 experiments related to the lectures.	Z,ZK	4
2133025	Design Design, design calculations and their applications in case of geared transmissions, axles and shafts, sliding and rolling bearings, shaft couplings and clutches.	Z	4
2011021	Constructive Geometry The subject is focused on geometric objects in the space - curves, surfaces and solids and their properties and mutual relations.	Z,ZK	6
2381054	Management and Economics of the Enterprise The subject is intended to teach the students of the Faculty of Mechanical Engineering the basic economic starting points necessary for technical reasoning and to help them understand the basic relationships between economic quantities costs - revenues, expenses - incomes and other basic economic terms. The goal is for the audience to be able to communicate with economists in organizations. Every product or service is valued at a selling price and therefore it is necessary to understand the simple costing of products and services. Every technician will encounter reports and should understand the basic structure of financial statements. As a future manager, he will compile and approve the operating budget. In the field of management, they will learn basic managerial functions and their content. Furthermore, they will learn how to use network analysis in project management. For decision-making purposes, they will learn the applications of multi-criteria decision-making. The basics of marketing and strategic management will be introduced.	Z,ZK	4
2011056	Mathematics I In the course, greater emphasis is placed on the theoretical basis of the concepts discussed and on the derivation of basic relationships and connections between concepts. Students will also get to know the procedures for solving problems with parametric input. In addition, students will gain extended knowledge in some thematic areas: eigennumbers and eigenvectors of a matrix, Taylor polynomial, integral as a limit function, integration of some special functions.	Z,ZK	8
2011062	Matematika II. Open and closed set, boundary in E^k . Real function of k -variables. Partial derivatives and differentiability. Gradient and directional derivative. Differential operators div (divergence) and curl (rotation). Function given implicitly. Local and global (= absolute) extremes of a function of more variables. Double integral, volume (=triple) integral, Fubini theorem. Transformation of integrals to polar, cylindrical and spherical coordinates. A simple smooth curve and line integral of a scalar and vector function. Circulation and Green's theorem. A potential vector field, independence of a line integral on the path. Simple smooth surface and surface integral of a scalar function and a vector function. Flow of a vector field through a surface. The Gauss-Ostrogradskij theorem.	Z,ZK	8
2011009	Mathematics III An introductory course in ordinary differential equation and infinite series.	Z,ZK	5
2311101	Mechanics I. Mechanics I deals with the basic concepts of statics. There are described the methods of solution of equilibrium of particles and rigid bodies and their systems with and without friction. There are introduced the methods of description of position and motion of particles and rigid bodies.	Z,ZK	4

2311102	Mechanics II. Kinematics of point and of rigid bodies. Transformation matrix. Kinematics of concurrent movements. Motion: translation, rotation, general planar motion, spherical motion, screw motion, general spatial motion. Composition of mechanisms. Basic planar mechanisms. Analytical methods in kinematics of mechanisms - Trigonometric and vector method. Graphical methods in kinematics. Basic theory of gearing. Transmission mechanisms with gears. Strutting and seizing in mechanisms. Cable mechanisms.	Z,ZK	4
2322029	Materials Science I. History and present state of materials engineering, overview of technical materials, internal structure of metals, crystal lattices and their defects, deformation, recrystallization and fracture of materials, structure and properties of materials and their testing, fundamentals of thermodynamics, phases and phase transformations, iron-carbon phase diagram.	KZ	3
2321039	Materials Science II. Fundamentals of metallurgy, iron-carbon alloys and influence of other elements, phase transformations, thermal, combined chemical and thermal and thermo-mechanical processing, technical iron-carbon alloys, non-ferrous metals and their alloys, plastics, structural ceramics, composites, selection of materials.	Z,ZK	4
2011049	Numerical Mathematics Numerical solution of systems of linear equations, iterative methods. Numerical solution of nonlinear algebraic equations. Least squares method. Numerical solution of ordinary differential equations, initial and boundary value problems. Numerical solution of basic linear partial differential equations by finite difference method.	Z,ZK	4
2012037	Computer Graphics	KZ	3
2372041	Computer Support for Study The course introduces students into creating technical and professional documents on computers or Web and into realizing technical computations with the use of computers. Students gain practical skills by creating an essay in a text editor, by realizing technical computations with a spreadsheet calculator, and by creating technical-based WWW page.	KZ	3
2181026	Momentum, Mass and Heat Transfer Fundamentals of transport phenomena balances in homogeneous fluids. Navier-Stokes equations. Momentum transport in turbulent flows. Mechanical energy equation. Residence time distributions in continuous systems. Conduction heat transfer. Forced and natural convection heat transfer. Heat transfer with phase changes and thermal radiation. Multicomponent systems. Mass transfer by molecular diffusion, convection, with chemical reactions and interphase mass transfer.	Z,ZK	5
2131002	Engineering Design II Principles of ISO GPS (Geometrical Products Specification). Students will get critical knowledge about ISO system of limits and fits, tolerancing, surface texture, geometrical tolerance, dimensional loops, tolerancing of angles and cones, tolerancing of threads. Integral part of course is a project where students apply and practice their knowledge from lectures.	Z,ZK	4
2133013	Engineering Design III. Design of assembly unit (draft drawing, detail drawing, assembly drawing, technical report)	Z	2
2133014	Engineering Design IV.	Z	2
2372083	Measurement in Engineering Overview of sensor principles for measurement of non-electrical variables (temperature, position, force, speed, acceleration, torque). Calibration and verification of measurement instruments.	KZ	3
2331068	Technology I. Foundry properties of metals. Treatment. Pouring. Casting solidification. Moulding and core making. Thermal treatment. Plastic deformation. Division of forming processes. Semi-products, heating-up. Cutting. Cold and hot forming. Welds. Weldability. Weldment testing. Thermal cutting. Brazing. Surface treatments.	Z,ZK	5
2341014	Technology II. mechanics of chip formation, cutting processes, finishing operations, non-traditional machining processes. Production rates calculation, machining economics. Automation of processes, programming of manufacture. Engineering metrology. Assembly techniques. Introduction to process planning.	Z,ZK	5
2012035	Algorithmization and Programming Fundamentals Programming in MATLAB and its programming language. MATLAB command line. Elementary commands, variable, assignment and expression. Matrices, vectors and operations. Writing M-script. Input and output. Condition and cycle. Algorithmization of simple problems in MATLAB. Graphical commands. Matrix operations. Systems of linear equations. Scripts and functions. Structure of program. Variables, expressions, assignment, and input / output commands. switch. For cycle. Arrays and files. Pointers. Structures. Algorithmization of simple programs: minimum, mean, norm, numerical integration, bisection method, Newton method, matrix operations. Direct methods for solution of systems of linear equations.	KZ	4
2153005	Fundamentals of Energy Conversions	Z	1
2383001	Fundamentals of Law Basic orientation in legal system is a necessary part of professional equipment of each expert with university degree. The aim of this course is to provide a view into the Czech Legal Order, particular sources of law and system of law (branch of law), using tutorials, lectures, specialised literature and significant legal regulations. It is necessary for students to know our legal institutions, that will be regularly in touch with, especially during their professional career and to learn how to work with the collection of laws. At the same time the course leads students to know some practical habits and processes while putting the law on, especially in domain of contracts and other important legal relationships and to make them ready to prepare professional presentations and to understand basic structures between law and engineering	Z	2

Code of the group: 12BS*7P-EPT

Name of the group: 12 2012 BSTR 7.sem povinné EPT

Requirement credits in the group: In this group you have to gain 20 credits

Requirement courses in the group: In this group you have to complete 4 courses

Credits in the group: 20

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) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
2151165	Hydraulic and Pneumatic Machines	Z,ZK	5	2P+2C	*	P
2151090	Industry power and heating plant	Z,ZK	5	2P+2C	*	P
2151554	Thermal Turbines	Z,ZK	5	2P+2C	*	P
2151559	Heat Exchangers and Boilers	Z,ZK	5	2P+2C	*	P

Characteristics of the courses of this group of Study Plan: Code=12BS*7P-EPT Name=12 2012 BSTR 7.sem povinné EPT

2151165	Hydraulic and Pneumatic Machines	Z,ZK	5
Classification and principles of operation of hydraulic machines. Criteria of hydrodynamical similarity. Hydraulic systems. Different types of pumps, construction, capacity control and operation in various conditions. Theory of compression processes. Constructions, calculation, capacity control of compressors, operation with various gases. Refrigerating compressors. Accessories of a compressor stations and plants. Economical and ecological problems of a compressed air production and distribution.			
2151090	Industry power and heating plant	Z,ZK	5
2151554	Thermal Turbines	Z,ZK	5
2151559	Heat Exchangers and Boilers	Z,ZK	5

Code of the group: 12BS*8P-EPT

Name of the group: 15 2012 BSTR 8.sem povinné EPT

Requirement credits in the group: In this group you have to gain 17 credits

Requirement courses in the group: In this group you have to complete 4 courses

Credits in the group: 17

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) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
2151118	Distributed Energy	Z,ZK	5	2P+2C	*	P
2151117	Design of Power Facilities	Z,ZK	5	2P+2C	*	P
2153006	Technology of Air Protection in Power Engineering	Z	2	0P+2C	*	P
2151158	Principles of Refrigerating Technology and Heat Pumps	Z,ZK	5	2P+2C	*	P

Characteristics of the courses of this group of Study Plan: Code=12BS*8P-EPT Name=15 2012 BSTR 8.sem povinné EPT

2151118	Distributed Energy	Z,ZK	5
2151117	Design of Power Facilities	Z,ZK	5
2153006	Technology of Air Protection in Power Engineering	Z	2
2151158	Principles of Refrigerating Technology and Heat Pumps	Z,ZK	5

Name of the block: Compulsory elective courses

Minimal number of credits of the block: 45

The role of the block: PV

Code of the group: 12B**1Q-HUM

Name of the group: 03 2012 bakalá ské povinn volitelné humanitární

Requirement credits in the group: In this group you have to gain at least 2 credits (at most 6)

Requirement courses in the group: In this group you have to complete at least 1 course (at most 3)

Credits in the group: 2

Note on the group: Ze skupiny humanitních předmětů nutno je d e n absolvovat

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
2383009	Communication and Dealing with People <i>Vladimír Brdek, Jan Horejc Jan Horejc Jan Horejc (Gar.)</i>	Z	2	1P+1C	*	PV

Characteristics of the courses of this group of Study Plan: Code=12B**1Q-HUM Name=03 2012 bakalá ské povinn volitelné humanitární

2383009	Communication and Dealing with People	Z	2
Human communication represents an irreplaceable phenomenon in human activity, as it is present in practically all of his activities. The same applies (with specific modifications) to the activities of managers. So you can't not communicate - you can only communicate badly, well and excellently.			

Code of the group: 12B**4Q-BZJ S+T

Name of the group: 08 2012 bakalá ské zkoušky z jazyk pro STR a TZIS

Requirement credits in the group: In this group you have to gain at least 2 credits (at most 10)

Requirement courses in the group: In this group you have to complete at least 1 course (at most 5)

Credits in the group: 2

Note on the group: Součástí tohoto bakalářského studijního programu je povinnost vykonat zkoušku z jednoho cizího jazyka. Student ji může vykonat kdykoliv v průběhu studia. Administrativně je předmět přiřazen ke studijnímu plánu čtvrtého semestru druhého ročníku, neboť se předpokládá, že si student během předcházejících semestrů nejprve doplňuje v jazykových kurzech (volitelných předmětech) jazykové znalosti zejména v oblasti odborné terminologie

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
2041061	English-Bachelor Exam <i>Ilona Šimice, Michaela Schusová, Hana Volejníková, Veronika Kratochvílová, Michele Le Blanc Ilona Šimice (Gar.)</i>	Z,ZK	2	0P+2C	*	PV
2041063	French - Bachelor Exam /FME <i>Michaela Schusová, Dušana Jirovská Eliška Vítková Dušana Jirovská (Gar.)</i>	Z,ZK	2	0P+2C	*	PV
2041062	German - Bachelor Exam / FME <i>Michaela Schusová, Jaroslava Kommová, Eliška Vítková, Petr Laurich Jaroslava Kommová Jaroslava Kommová (Gar.)</i>	Z,ZK	2	0P+2C	*	PV
2041065	Russian - Bachelor Exam / FME <i>Michaela Schusová, Hana Volejníková, Dušana Jirovská Eliška Vítková Dušana Jirovská (Gar.)</i>	Z,ZK	2	0P+2C	*	PV
2041064	Spanish - Bachelor Exam / FME <i>Michaela Schusová, Jaime Andrés Villagómez Eliška Vítková Jaime Andrés Villagómez (Gar.)</i>	Z,ZK	2	0P+2C	*	PV

Characteristics of the courses of this group of Study Plan: Code=12B4Q-BZJ S+T Name=08 2012 bakalářské zkoušky z jazyků pro STR a TZIS**

2041061	English-Bachelor Exam	Z,ZK	2
Mapped to the Common European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulties, to take part in discussions, to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.			
2041063	French - Bachelor Exam /FME	Z,ZK	2
Mapped to the Common European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulties, to take part in discussions, to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.			
2041062	German - Bachelor Exam / FME	Z,ZK	2
Mapped to the Common European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulties, to take part in discussions, to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.			
2041065	Russian - Bachelor Exam / FME	Z,ZK	2
Mapped to the Common European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulties, to take part in discussions, to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.			
2041064	Spanish - Bachelor Exam / FME	Z,ZK	2
Mapped to the Common European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulties, to take part in discussions, to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.			

Code of the group: 12BS*6Q-OP

Name of the group: 10 2012 BSTR 6. sem oborové projekty

Requirement credits in the group: In this group you have to gain 2 credits

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

Credits in the group: 2

Note on the group: Student si vybere předmět příslušný oboru, který studuje

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
2372091	Project	KZ	2	0P+2C	*	PV
2362091	Project	KZ	2	0P+2C	*	PV
2152091	Departmental Project	KZ	2	0P+2C	*	PV
2182091	Project <i>Tomáš Jirout</i>	KZ	2	0P+2C	*	PV

Characteristics of the courses of this group of Study Plan: Code=12BS*6Q-OP Name=10 2012 BSTR 6. sem oborové projekty

2372091	Project	KZ	2
An individual project from the branch of specialisation, which student will study on his/her master level			
2362091	Project	KZ	2
2152091	Departmental Project	KZ	2
2182091	Project	KZ	2
Absolvent se seznámí se základy oboru Procesní technika.			

Code of the group: 12BS*6Q-PP

Name of the group: 11 2012 BSTR 6. sem prezentace projekt

Requirement credits in the group: In this group you have to gain 4 credits

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

Credits in the group: 4

Note on the group: 2363091 neseptán Student si vybere předmět příslušný oboru, který studuje

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
2153091	Presentation of Project	Z	4	4B	*	PV
2363091	Project Presentation	Z	4	4B		PV
2373091	Project presentation	Z	4	4B	*	PV
2183091	Project Presentation <i>Tomáš Jirout</i>	Z	4	0P+4C	*	PV

Characteristics of the courses of this group of Study Plan: Code=12BS*6Q-PP Name=11 2012 BSTR 6.sem prezentace projekt

2153091	Presentation of Project	Z	4
2363091	Project Presentation	Z	4
2373091	Project presentation	Z	4
Diploma thesis or bachelor work presentation. Student should study the presentation software possibilities and proposition of the department. Student should prepare the presentation of actual version of his diploma or bachelor work and present it in the face of the other student. The presentation will continue with discussion. Consequently, the work should be presented as a pdf file on a temporal web page.			
2183091	Project Presentation	Z	4
Preparation and presentation of a given project theme.			

Code of the group: 12BS*7Q-EPT-P1

Name of the group: 13 2012 BSTR 7.sem 1povvol EPT-P1

Requirement credits in the group: In this group you have to gain 5 credits

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

Credits in the group: 5

Note on the group: Kód předmětu Projekt I. se zapisuje podle ústavu: 2153707 Ústav energetiky a 2183707 Ústav procesní a zpracovatelské techniky

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
2183707	Project I. <i>Radek Šulc, Lukáš Krátký Lukáš Krátký Lukáš Krátký (Gar.)</i>	Z	5	0P+7C	*	PV
2153707	Project I.	Z	5	0P+7C	*	PV

Characteristics of the courses of this group of Study Plan: Code=12BS*7Q-EPT-P1 Name=13 2012 BSTR 7.sem 1povvol EPT-P1

2183707	Project I.	Z	5
Project, dimensioning and designing solution of basic elements for process technology.			
2153707	Project I.	Z	5

Code of the group: 12BS*7Q-EPT-ZAM

Name of the group: 14 2012 BSTR 7.sem 1povvol EPT-zam

Requirement credits in the group: In this group you have to gain 5 credits

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

Credits in the group: 5

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) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
2181502	Hydromechanical Equipment <i>Tomáš Jirout Tomáš Jirout Tomáš Jirout (Gar.)</i>	Z,ZK	5	2P+2C	*	PV
2151002	Nuclear Power Principles	Z,ZK	5	2P+2C	*	PV

Characteristics of the courses of this group of Study Plan: Code=12BS*7Q-EPT-ZAM Name=14 2012 BSTR 7.sem 1povvol EPT-zam

2181502	Hydromechanical Equipment	Z,ZK	5
Design, principles and basic calculations of following equipment: pipes and pipe networks, packed and bubble columns, filters, settlers, centrifuges and cyclones, fluidized beds, mixing equipment, silos and conveyors, crushers and mills, granulators, extruders, injection and blow moulding machines, rolls and calenders.			
2151002	Nuclear Power Principles	Z,ZK	5
Physical fundamentals of nuclear energy. Development and heat removal from core. Basic materials for nuclear reactors. Basic types of nuclear reactors. Review of advanced types of nuclear reactors. Fuel cycle. Reactor radiation, detection and quantification, determination of radiation doses. Problems of nuclear safety and technical provisions.			

Code of the group: 12BS*8Q-EPT-BP

Name of the group: 16 2012 BSTR 8.sem 1povvol EPT-BP

Requirement credits in the group: In this group you have to gain 5 credits

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

Credits in the group: 5

Note on the group:

Kód předmětu Bakalářská práce se zapisuje podle ústavu: 2153985 Ústav energetiky
2183985 Ústav procesní a zpracovatelské techniky

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
2183985	Bachelor Thesis <i>Tomáš Jirout</i>	Z	5	0P+6C	*	PV
2153985	Bachelor Thesis	Z	5	0P+6C	*	PV

Characteristics of the courses of this group of Study Plan: Code=12BS*8Q-EPT-BP Name=16 2012 BSTR 8.sem 1povvol EPT-BP

2183985	Bachelor Thesis	Z	5
Bachelor thesis is final individual work. This work checks ability of logical independent technical thinking and treatment with technical materials. There is applied acquired knowledge from previous study periods.			
2153985	Bachelor Thesis	Z	5

Code of the group: 12BS*8R-EPT-ZAM

Name of the group: 17 2012 BSTR 8.sem 2povvol EPT-zam

Requirement credits in the group: In this group you have to gain 20 credits

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

Credits in the group: 20

Note on the group:

Ze skupiny PV předmětů nutno d v a volit

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
2181507	Diffusion separation equipment <i>Radek Šulc, Vojtěch B. Iohlav Radek Šulc Radek Šulc (Gar.)</i>	Z,ZK	5	2P+2C	*	PV
2152028	Energy Audit and Legislation	KZ	5	2P+2C	*	PV
2151702	Renewable Energy Sources	Z,ZK	5	2P+2C	*	PV
2181508	Heat transfer equipments <i>Martin Dostál, Stanislav Solna Martin Dostál Martin Dostál (Gar.)</i>	Z,ZK	5	2P+2C	*	PV

Characteristics of the courses of this group of Study Plan: Code=12BS*8R-EPT-ZAM Name=17 2012 BSTR 8.sem 2povvol EPT-zam

2181507	Diffusion separation equipment	Z,ZK	5
Classis from Equipment for diffusion separation processes are giving a basic knowledge of processes and equipments where gas or liquid mixture is been separated due to principals of physical-chemical equilibriums or on the basis of mass transfer mechanisms. They are used for concentrating of products from dilute solutions or in turn for purification of diluted gasses or liquid solutions.			
2152028	Energy Audit and Legislation	KZ	5
2151702	Renewable Energy Sources	Z,ZK	5
2181508	Heat transfer equipments	Z,ZK	5
Fundamentals of thermodynamics and conductive and convective heat transfer. Enthalpy balancing. Technical thermodynamics and basic thermodynamic cycles. Functional description, mechanical design, thermal and hydraulic design of a heat exchangers, evaporators and dryers.			

Name of the block: Elective courses

Minimal number of credits of the block: 32

The role of the block: V

Code of the group: 12BS**V-ALFA

Name of the group: 02 2012 ALFA volitelné pro STR

Requirement credits in the group: In this group you have to gain 32 credits

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

Credits in the group: 32

Note on the group:

Předměty typu Alfa (A) nejsou u studijního programu B2341 Strojírenství povinné, avšak jsou povinné u studijního programu B2342 Teoretický základ strojírenství.

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
202A041	Physics I.	ZK	3	0P+0L	*	V
202A025	Physics II.A	ZK	2	0P+0C	*	V

201A021	Constructive Geometry A <i>Ivana Linkeová</i>	ZK	3	0P+0C	*	v
201A056	Mathematics I.A <i>Radka Keslerová</i>	ZK	4	0P+0C	*	v
201A062	Mathematics II.A <i>Radka Keslerová</i>	ZK	4	0P+0C	*	v
201A009	Mathematics III.A <i>Stanislav Kra mar</i>	ZK	2	0P+0C	*	v
201A049	Numerical Mathematics A <i>Lud k Beneš</i>	ZK	2	0P+0C	*	v

Characteristics of the courses of this group of Study Plan: Code=12BSV-ALFA Name=02 2012 ALFA volitelné pro STR**

202A041	Physics I. Kinematics and dynamics of a particle motion. Principle of conservation of energy. System of particles, centre of mass. Rigid body. Continuum, elastic properties of bodies. Oscillations, waves. Fluid mechanics. Temperature and heat transfer. Kinetic theory of gases. Thermodynamics. Electric field, current, conductivity, resistance. Conductors, semiconductors, insulators. Magnetic field. Magnetic materials. Laboratories - accuracy of measurements, systematic and random errors, uncertainty of direct and indirect measurements, regression, measurements of 11 various experiments related to the lectures.	ZK	3
202A025	Physics II.A Faraday's law of electromagnetic induction. Maxwell's equations, electromagnetic waves. Light, wave optics, geometrical optics. Quantum properties of electromagnetic waves. Interaction of radiation with matter. Photoelectric effect. Wave-particle nature of matter. Quantum-mechanical description of particle's motion. Hydrogen atom and periodic system of elements. Spectra, x-rays, laser. Band theory of solids, semiconductors. Nucleus, radioactivity, sources of nuclear energy. Laboratories - measurements of 6 experiments related to the lectures.	ZK	2
201A021	Constructive Geometry A The subject is focused on geometric objects in the space - curves, surfaces and solids and their properties and mutual relations.	ZK	3
201A056	Mathematics I.A Introduction to linear algebra, analytic geometry of straight lines and planes in E ³ , calculus of functions of one variable	ZK	4
201A062	Mathematics II.A Open and closed set, boundary in E ⁿ . Real function of k-variables. Partial derivatives and differentiability. Gradient and directional derivative. Differential operators div (divergence) and curl (rotation). Function given implicitly. Local and global (= absolute) extremes of a function of more variables. Double integral, volume (=triple) integral, Fubini theorem. Transformation of integrals to polar, cylindrical and spherical coordinates. A simple smooth curve and line integral of a scalar and vector function. Circulation and Green's theorem. A potential vector field, independence of a line integral on the path. Simple smooth surface and surface integral of a scalar function and a vector function. Flow of a vector field through a surface. The Gauss-Ostrogradskij theorem.	ZK	4
201A009	Mathematics III.A	ZK	2
201A049	Numerical Mathematics A	ZK	2

Code of the group: 12B**1V-DOP SEMI

Name of the group: 05 2012 doporu ené seminá e

Requirement credits in the group:

Requirement courses in the group:

Credits in the group: 0

Note on the group: Pokud si chce student své dosud získané znalosti (například z matematiky, fyziky, cizích jazyků atd.) doplnit, může si zapsat některý z volitelných předmětů, které příslušné ústavy pro 1. semestr (zimní) vypisují. Doporučujeme zejména předměty uvedené v této skupině

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
2026016	Physics - Seminar	Z	2	0P+2C	1	v
2016007	Mathematics I. - Seminar <i>Radka Keslerová, Hynek ezní ek, Olga Majlingová Radka Keslerová Gejza Dohnal (Gar.)</i>	Z	2	0P+2C	1	v

Characteristics of the courses of this group of Study Plan: Code=12B1V-DOP SEMI Name=05 2012 doporu ené seminá e**

2026016	Physics - Seminar The subject is mainly meant for high-school students for repetition of high-school physics.	Z	2
2016007	Mathematics I. - Seminar	Z	2

Code of the group: 12B**1V-DOP ZJK

Name of the group: 06 2012 doporu ené základní jazykové kurzy a prezentace

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) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
2046155	English Conversation <i>Ilona Šimice, Michele Le Blanc Ilona Šimice Michele Le Blanc (Gar.)</i>	Z	2	0P+2C	*	v
2046156	English Conversation <i>Ilona Šimice, Michele Le Blanc</i>	Z	2	0P+2C	L	v
2046071	English - Lower Intermediate <i>Ilona Šimice, Michaela Schusová, Hana Volejníková, Veronika Kratochvílová</i>	Z	2	0P+2C	L	v
2046070	English - Lower Intermediate <i>Ilona Šimice, Michaela Schusová, Hana Volejníková, Veronika Kratochvílová</i> Michaela Schusová <i>Ilona Šimice (Gar.)</i>	Z	2	0P+2C	Z	v
2046074	English - Advanced <i>Ilona Šimice, Michaela Schusová, Hana Volejníková, Veronika Kratochvílová, Michele Le Blanc</i> Michaela Schusová <i>Ilona Šimice (Gar.)</i>	Z	2	0P+2C	Z	v
2046075	English - Advanced <i>Ilona Šimice, Michaela Schusová, Hana Volejníková, Veronika Kratochvílová, Michele Le Blanc</i> Ilona Šimice <i>Ilona Šimice (Gar.)</i>	Z	2	0P+2C	L	v
2046072	English - Upper Intermediate <i>Ilona Šimice, Michaela Schusová, Hana Volejníková, Veronika Kratochvílová</i> Michaela Schusová <i>Ilona Šimice (Gar.)</i>	Z	2	0P+2C	Z	v
2046073	English - Upper Intermediate <i>Ilona Šimice, Michaela Schusová, Hana Volejníková, Veronika Kratochvílová</i> Ilona Šimice <i>Ilona Šimice (Gar.)</i>	Z	2	0P+2C	L	v
2046068	English - Beginners <i>Ilona Šimice, Michaela Schusová, Hana Volejníková, Veronika Kratochvílová</i> Michaela Schusová <i>Ilona Šimice (Gar.)</i>	Z	2	0P+2C	Z	v
2046069	English - Beginners <i>Ilona Šimice, Michaela Schusová, Hana Volejníková, Veronika Kratochvílová</i> Ilona Šimice	Z	2	0P+2C	L	v
2046126	Czech Lower Intermediate <i>Jaroslava Kommová</i>	Z	2	0P+2C	L	v
2046125	Czech Lower Intermediate <i>Jaroslava Kommová</i>	Z	2	0P+2C	Z	v
2046118	Czech -Advanced <i>Jaroslava Kommová</i>	Z	2	0P+2C	L	v
2046117	Czech -Advanced <i>Jaroslava Kommová</i>	Z	2	0P+2C	Z	v
2046127	Czech - Upper Intermediate <i>Jaroslava Kommová</i>	Z	2	0P+2C	Z	v
2046128	Czech - Upper Intermediate <i>Jaroslava Kommová</i>	Z	2	0P+2C	L	v
2046119	Czech Language for Beginners I. <i>Jaroslava Kommová</i>	Z	2	0P+2C	Z	v
2046120	Czech Language for Beginners II. <i>Jaroslava Kommová</i>	Z	2	0P+2C	L	v
2046086	French - Lower Intermediate Course <i>Michaela Schusová, Dušana Jirovská</i> Michaela Schusová <i>Michaela Schusová (Gar.)</i>	Z	2	0P+2C	Z	v
2046087	French - Lower Intermediate Course <i>Michaela Schusová, Dušana Jirovská</i> Dušana Jirovská <i>Dušana Jirovská (Gar.)</i>	Z	2	0P+2C	L	v
2046091	French - Advanced <i>Michaela Schusová, Dušana Jirovská</i> Dušana Jirovská <i>Dušana Jirovská (Gar.)</i>	Z	2	0P+2C	L	v
2046090	French - Advanced <i>Michaela Schusová, Dušana Jirovská, Eliška Vítková</i> Eliška Vítková <i>Eliška Vítková (Gar.)</i>	Z	2	0P+2C	Z	v
2046089	French - Upper Intermediate <i>Michaela Schusová, Dušana Jirovská</i> Dušana Jirovská <i>Dušana Jirovská (Gar.)</i>	Z	2	0P+2C	L	v
2046088	French - Upper Intermediate <i>Michaela Schusová, Dušana Jirovská</i> Michaela Schusová <i>Michaela Schusová (Gar.)</i>	Z	2	0P+2C	Z	v
2046084	French - Beginners <i>Michaela Schusová, Dušana Jirovská</i> Michaela Schusová <i>Michaela Schusová (Gar.)</i>	Z	2	0P+2C	Z	v
2046085	French - Beginners' Course <i>Michaela Schusová, Dušana Jirovská</i> Michaela Schusová <i>Dušana Jirovská (Gar.)</i>	Z	2	0P+2C	L	v
2146060	Indonesian Language Course for Exchange	Z	2	0P+2C	*	v
2146061	Technical Indonesian - Course I.	Z	2	0P+2C	Z	v
2144062	Technical Indonesian - Course II.	Z,ZK	3	1P+2C	L	v
2046078	German - Lower Intermediate Course <i>Michaela Schusová, Jaroslava Kommová, Eliška Vítková, Petr Laurich</i> Michaela Schusová <i>Michaela Schusová (Gar.)</i>	Z	2	0P+2C	Z	v

2046079	German - Lower Intermediate Course <i>Michaela Schusová, Jaroslava Kommová, Eliška Vítková, Petr Laurich Eliška Vítková Jaroslava Kommová (Gar.)</i>	Z	2	0P+2C	L	v
2046083	German - Advanced Course <i>Michaela Schusová, Jaroslava Kommová, Eliška Vítková, Petr Laurich Jaroslava Kommová Jaroslava Kommová (Gar.)</i>	Z	2	0P+2C	L	v
2046082	German - Advanced Course <i>Michaela Schusová, Jaroslava Kommová, Eliška Vítková, Petr Laurich Michaela Schusová Michaela Schusová (Gar.)</i>	Z	2	0P+2C	Z	v
2046081	German - Upper Intermediate Course <i>Michaela Schusová, Jaroslava Kommová, Eliška Vítková, Petr Laurich Eliška Vítková Jaroslava Kommová (Gar.)</i>	Z	2	0P+2C	L	v
2046080	German - Upper Intermediate Course <i>Michaela Schusová, Jaroslava Kommová, Eliška Vítková, Petr Laurich Michaela Schusová Michaela Schusová (Gar.)</i>	Z	2	0P+2C	Z	v
2046076	German - Beginners <i>Michaela Schusová, Jaroslava Kommová, Eliška Vítková, Petr Laurich Michaela Schusová Petr Laurich (Gar.)</i>	Z	2	0P+2C	Z	v
2046077	German - Beginners <i>Michaela Schusová, Jaroslava Kommová, Eliška Vítková, Petr Laurich Eliška Vítková Jaroslava Kommová (Gar.)</i>	Z	2	0P+2C	L	v
2046161	Presentations in English <i>Michaela Schusová</i>	Z	2	0P+2C	*	v
2046166	Presentations in Czech <i>Jaroslava Kommová</i>	Z	2	0P+2C	*	v
2046162	Presentations in German <i>Jaroslava Kommová, Eliška Vítková, Petr Laurich Jaroslava Kommová Jaroslava Kommová (Gar.)</i>	Z	2	0P+2C	*	v
2046164	Presentations in Russian <i>Dušana Jirovská</i>	Z	2	0P+2C	*	v
2046163	Presentations in French language <i>Dušana Jirovská Dušana Jirovská</i>	Z	2	0P+2C	*	v
2046165	Presentations in Spanish <i>Eliška Vítková</i>	Z	2	0P+2C	*	v
2046137	Russian - Lower Intermediate Course <i>Michaela Schusová, Hana Volejníková, Dušana Jirovská, Eliška Vítková Michaela Schusová Michaela Schusová (Gar.)</i>	Z	2	0P+2C	Z	v
2046138	Russian - Lower Intermediate Course <i>Michaela Schusová, Hana Volejníková, Dušana Jirovská Dušana Jirovská</i>	Z	2	0P+2C	L	v
2046141	Russian - Advanced <i>Michaela Schusová, Hana Volejníková, Dušana Jirovská, Eliška Vítková Michaela Schusová Michaela Schusová (Gar.)</i>	Z	2	0P+2C	Z	v
2046142	Russian - Advanced <i>Michaela Schusová, Hana Volejníková, Dušana Jirovská Dušana Jirovská</i>	Z	2	0P+2C	L	v
2046140	Russian - Upper Intermediate <i>Michaela Schusová, Hana Volejníková, Dušana Jirovská Dušana Jirovská</i>	Z	2	0P+2C	L	v
2046139	Russian - Upper Intermediate <i>Michaela Schusová, Hana Volejníková, Dušana Jirovská, Eliška Vítková Michaela Schusová Michaela Schusová (Gar.)</i>	Z	2	0P+2C	Z	v
2046136	Russian - Beginners <i>Michaela Schusová, Hana Volejníková, Dušana Jirovská Dušana Jirovská</i>	Z	2	0P+2C	L	v
2046135	Russian - Beginners <i>Michaela Schusová, Hana Volejníková, Dušana Jirovská, Eliška Vítková Michaela Schusová Michaela Schusová (Gar.)</i>	Z	2	0P+2C	Z	v
2046099	Spanish - Lower Intermediate <i>Michaela Schusová, Jaime Andrés Villagómez Eliška Vítková Jaime Andrés Villagómez (Gar.)</i>	Z	2	0P+2C	L	v
2046098	Spanish - Lower Intermediate <i>Michaela Schusová, Eliška Vítková, Jaime Andrés Villagómez Eliška Vítková Eliška Vítková (Gar.)</i>	Z	2	0P+2C	Z	v
2046096	Spanish - Beginners <i>Michaela Schusová, Eliška Vítková, Jaime Andrés Villagómez Eliška Vítková Eliška Vítková (Gar.)</i>	Z	2	0P+2C	Z	v
2046097	Spanish - Beginners <i>Michaela Schusová, Jaime Andrés Villagómez Jaime Andrés Villagómez Jaime Andrés Villagómez (Gar.)</i>	Z	2	0P+2C	L	v

Characteristics of the courses of this group of Study Plan: Code=12B1V-DOP ZJK Name=06 2012 doporučené základní jazykové kurzy a prezentace**

2046155	English Conversation Improving communicative skills in speaking on general topics and general technical topics.	Z	2
2046156	English Conversation Improving communicative skills in speaking on general topics and general technical topics.	Z	2
2046071	English - Lower Intermediate Mapped to the Common European Framework of Reference Level A2 Aim: Understanding clearly spoken language about everyday situations which a student meets either at school or at his/her free time and speaking about them. Writing in a simple way about familiar topics. reading and comprehension of simple texts. Improvement of professional language.	Z	2

2046070	English - Lower Intermediate	Z	2
Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language. A1 - A2.			
2046074	English - Advanced	Z	2
The aim: comprehension of spoken English as well as lectures given in English without great difficulties and active participation in a discussion. Written and oral skills on advanced level. Ability to write a summary, a report, an essay. reading and comprehension of popular-scientific and scientific articles or texts from student's field of studies without difficulties. Grammar structures on advanced level. B1 - B2.			
2046075	English - Advanced	Z	2
Mapped to the Common European Framework of Reference Level B1 - B2. The aim: comprehension of spoken English as well as lectures given in English without great difficulties and active participation in a discussion. Written and oral skills on advanced level. Ability to write a summary, a report, an essay. reading and comprehension of popular-scientific and scientific articles or texts from student's field of studies without difficulties. Grammar structures on advanced level.			
2046072	English - Upper Intermediate	Z	2
The aim is to extend language skills taking into consideration professional English and common professional terminology. Comprehension of standard English speech and conversation about topics of everyday life - at school, at work, during free time, on intermediate level. Broadening grammar knowledge. A2 - B1.			
2046073	English - Upper Intermediate	Z	2
Mapped to the Common European Framework of Reference Level B1. The aim is to extend language skills taking into consideration professional English and common professional terminology. Comprehension of standard English speech and conversation about topics of everyday life - at school, at work, during free time, on intermediate level. Broadening grammar knowledge.			
2046068	English - Beginners	Z	2
Aim: Basic vocabulary of everyday life in a written and spoken form. Understanding and use of basic expressions of general scientific terminology (professional language). A1			
2046069	English - Beginners	Z	2
Mapped to the Common European Framework of Reference Level A1 Aim: Basic vocabulary of everyday life in a written and spoken form. Understanding and use of basic expressions of general scientific terminology (professional language).			
2046126	Czech Lower Intermediate	Z	2
Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2046125	Czech Lower Intermediate	Z	2
Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2046118	Czech -Advanced	Z	2
Mapped to the level of Common European Framework of Reference: B1- B2 The aim: comprehension of spoken Czech as well as lectures given in Czech without great difficulties and active participation in a discussion. Written and oral skills on advanced level. Ability to write a summary, a report, an essay. Reading and comprehension of popular-scientific and scientific articles or texts from student's field of studies without difficulties. Grammar structures on advanced level.			
2046117	Czech -Advanced	Z	2
Comprehension of spoken language as well as lectures in Czech on topics familiar to the student. Communication with native speakers, participation in discussions. Expressing opinions. Written skills. Ability to write an essay or a report. Reading and understanding texts concerning current issues and popular scientific and technical articles.			
2046127	Czech - Upper Intermediate	Z	2
Understanding standard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ability to describe experiences and events, briefly explain one's opinions and plans. Reading and understanding general and technical texts.			
2046128	Czech - Upper Intermediate	Z	2
Mapped to the Common European Framework of Reference Level A2-B1. The aim is to extend language skills taking into consideration professional Czech and common professional terminology. Comprehension of standard Czech speech and conversation about topics of everyday life - at school, at work, during free time, on intermediate level. Broadening the knowledge technical language.			
2046119	Czech Language for Beginners I.	Z	2
Basic vocabulary of everyday life in a spoken and written form. Understanding and use of basic expressions of general scientific terminology (professional language)			
2046120	Czech Language for Beginners II.	Z	2
Mapped to the Common European Framework of Reference Level A1 Aim: Basic vocabulary of everyday life in a written and spoken form. Understanding and use of basic expressions of general scientific terminology (professional language).			
2046086	French - Lower Intermediate Course	Z	2
Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2046087	French - Lower Intermediate Course	Z	2
Mapped to the level of Common European Framework of Reference: A2 Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2046091	French - Advanced	Z	2
Mapped to the level of Common European Framework of reference: B1 - B2 Comprehension of spoken language as well as lectures in French on topics familiar to the student. Communication with native speakers, participation in discussions. Expressing opinions. Written skills. Ability to write an essay or a report. Reading and understanding texts concerning current issues and popular scientific and technical articles.			
2046090	French - Advanced	Z	2
Comprehension of spoken language as well as lectures in French on topics familiar to the student. Communication with native speakers, participation in discussions. Expressing opinions. Written skills. Ability to write an essay or a report. Reading and understanding texts concerning current issues and popular scientific and technical articles.			
2046089	French - Upper Intermediate	Z	2
Mapped to the level of Common European Framework of Reference:A2 - B1 Understanding standard speech about familiar topics, that a students comes across at work, at school, during free time, and talking about these topics. Ability to describe experiences and events, explain one's opinions and plans. Reading and understanding general and technical texts.			
2046088	French - Upper Intermediate	Z	2
Understanding standard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ability to describe experiences and events, briefly explain one's opinions and plans. Reading and understanding general and technical texts.			
2046084	French - Beginners	Z	2
Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			

2046085	French - Beginners' Course Mapped to the level of Common European Framework of Reference: A1 Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.	Z	2
2146060	Indonesian Language Course for Exchange Basic of Indonesian Language for Student Exchange Program to Indonesia	Z	2
2146061	Technical Indonesian - Course I. Second part of Indonesian Language for Student Exchange Program to Indonesia	Z	2
2144062	Technical Indonesian - Course II. Basic of Indonesian Language for Student Exchange Program to Indonesia	Z,ZK	3
2046078	German - Lower Intermediate Course Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.	Z	2
2046079	German - Lower Intermediate Course Mapped to the level of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a student meets either at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. reading and comprehension of simple texts. Improvement of professional language.	Z	2
2046083	German - Advanced Course Mapped to the level of Common European Framework of Reference: B1- B2 The aim: comprehension of spoken German as well as lectures given in German without great difficulties and active participation in a discussion. Written and oral skills on advanced level. Ability to write a summary, a report, an essay. Reading and comprehension of popular-scientific and scientific articles or texts from student's field of studies without difficulties. Grammar structures on advanced level.	Z	2
2046082	German - Advanced Course Comprehension of spoken language as well as lectures in German on topics familiar to the student. Communication with native speakers, participation in discussions. Expressing opinions. Written skills. Ability to write an essay or a report. Reading and understanding texts concerning current issues and popular scientific and technical articles.	Z	2
2046081	German - Upper Intermediate Course Mapped to the level of Common European Framework of Reference: A2 - B1 Understanding standard speech about familiar topics, that a student comes across at work, at school, during free time, and talking about these topics. Ability to describe experiences and events, explain one's opinions and plans. Reading and understanding general and technical texts.	Z	2
2046080	German - Upper Intermediate Course Understanding standard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ability to describe experiences and events, briefly explain one's opinions and plans. Reading and understanding general and technical texts.	Z	2
2046076	German - Beginners Basic vocabulary of everyday life in a spoken and written form. Understanding and use of basic expressions of general scientific terminology (professional language)	Z	2
2046077	German - Beginners Mapped to the level Common European Framework of Reference A1 Basic vocabulary of everyday life in a written and spoken form. Understanding and use of basic expressions of general scientific terminology (professional language).	Z	2
2046161	Presentations in English Preparing students to present in English on technical topics, with a possible co-operation with specialized departments.	Z	2
2046166	Presentations in Czech Preparing students to give presentations in English on technical topics, with a possible co-operation with specialized departments.	Z	2
2046162	Presentations in German Preparation for presenting technical topics in German, possibly in cooperation with specialized departments.	Z	2
2046164	Presentations in Russian Preparation for presenting technical topics in Russian, possibly in cooperation with specialized departments.	Z	2
2046163	Presentations in French language Preparation for presenting technical topics in French, possibly in cooperation with specialized departments.	Z	2
2046165	Presentations in Spanish Preparation for presenting technical topics in Spanish, possibly in cooperation with specialized departments.	Z	2
2046137	Russian - Lower Intermediate Course Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.	Z	2
2046138	Russian - Lower Intermediate Course Mapped to the level of Common European Framework of Reference: A2 Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.	Z	2
2046141	Russian - Advanced Comprehension of spoken language as well as lectures in Russian on topics familiar to the student. Communication with native speakers, participation in discussions. Expressing opinions. Written skills. Ability to write an essay or a report. Reading and understanding texts concerning current issues and popular scientific and technical articles.	Z	2
2046142	Russian - Advanced Mapped to the level of Common European Framework of reference: B1 - B2 Comprehension of spoken language as well as lectures in Russian on topics familiar to the student. Communication with native speakers, participation in discussions. Expressing opinions. Written skills. Ability to write an essay or a report. Reading and understanding texts concerning current issues and popular scientific and technical articles.	Z	2
2046140	Russian - Upper Intermediate Mapped to the level of Common European Framework of Reference: A2 - B1 Understanding standard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ability to describe experiences and events, briefly explain one's opinions and plans. Reading and understanding general and technical texts.	Z	2
2046139	Russian - Upper Intermediate Understanding standard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ability to describe experiences and events, briefly explain one's opinions and plans. Reading and understanding general and technical texts.	Z	2
2046136	Russian - Beginners Mapped to the level of Common European Framework of Reference: A1 Basic vocabulary of everyday life in a spoken and written form. Understanding and use of basic expressions of general scientific terminology (professional language)	Z	2
2046135	Russian - Beginners Basic vocabulary of everyday life in a spoken and written form. Understanding and use of basic expressions of general scientific terminology (professional language)	Z	2

2046099	Spanish - Lower Intermediate	Z	2
Mapped to the level of Common European Framework of Reference A2 Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2046098	Spanish - Lower Intermediate	Z	2
Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2046096	Spanish - Beginners	Z	2
Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2046097	Spanish - Beginners	Z	2
Mapped to the Common European Framework of Reference Level A1. Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			

List of courses of this pass:

Code	Name of the course	Completion	Credits
2011009	Mathematics III An introductory course in ordinary differential equation and infinite series.	Z,ZK	5
2011021	Constructive Geometry The subject is focused on geometric objects in the space - curves, surfaces and solids and their properties and mutual relations.	Z,ZK	6
2011049	Numerical Mathematics Numerical solution of systems of linear equations, iterative methods. Numerical solution of nonlinear algebraic equations. Least squares method. Numerical solution of ordinary differential equations, initial and boundary value problems. Numerical solution of basic linear partial differential equations by finite difference method.	Z,ZK	4
2011056	Mathematics I In the course, greater emphasis is placed on the theoretical basis of the concepts discussed and on the derivation of basic relationships and connections between concepts. Students will also get to know the procedures for solving problems with parametric input. In addition, students will gain extended knowledge in some thematic areas: eigennumbers and eigenvectors of a matrix, Taylor polynomial, integral as a limit function, integration of some special functions.	Z,ZK	8
2011062	Matematika II. Open and closed set, boundary in E^k . Real function of k-variables. Partial derivatives and differentiability. Gradient and directional derivative. Differential operators div (divergence) and curl (rotation). Function given implicitly. Local and global (= absolute) extremes of a function of more variables. Double integral, volume (=triple) integral, Fubini theorem. Transformation of integrals to polar, cylindrical and spherical coordinates. A simple smooth curve and line integral of a scalar and vector function. Circulation and Green's theorem. A potential vector field, independence of a line integral on the path. Simple smooth surface and surface integral of a scalar function and a vector function. Flow of a vector field through a surface. The Gauss-Ostrogradskij theorem.	Z,ZK	8
2012035	Algorithmization and Programming Fundamentals Programming in MATLAB and its programming language. MATLAB command line. Elementary commands, variable, assignment and expression. Matrices, vectors and operations. Writing M-script. Input and output. Condition and cycle. Algorithmization of simple problems in MATLAB. Graphical commands. Matrix operations. Systems of linear equations. Scripts and functions. Structure of program. Variables, expressions, assignment, and input / output commands. switch. For cycle. Arrays and files. Pointers. Structures. Algorithmization of simple programs: minimum, mean, norm, numerical integration, bisection method, Newton method, matrix operations. Direct methods for solution of systems of linear equations.	KZ	4
2012037	Computer Graphics	KZ	3
2016007	Mathematics I. - Seminar	Z	2
201A009	Mathematics III.A	ZK	2
201A021	Constructive Geometry A The subject is focused on geometric objects in the space - curves, surfaces and solids and their properties and mutual relations.	ZK	3
201A049	Numerical Mathematics A	ZK	2
201A056	Mathematics I.A Introduction to linear algebra, analytic geometry of straight lines and planes in E^3 , calculus of functions of one variable	ZK	4
201A062	Mathematics II.A Open and closed set, boundary in E^k . Real function of k-variables. Partial derivatives and differentiability. Gradient and directional derivative. Differential operators div (divergence) and curl (rotation). Function given implicitly. Local and global (= absolute) extremes of a function of more variables. Double integral, volume (=triple) integral, Fubini theorem. Transformation of integrals to polar, cylindrical and spherical coordinates. A simple smooth curve and line integral of a scalar and vector function. Circulation and Green's theorem. A potential vector field, independence of a line integral on the path. Simple smooth surface and surface integral of a scalar function and a vector function. Flow of a vector field through a surface. The Gauss-Ostrogradskij theorem.	ZK	4
2021025	Physics II. Faraday's law of electromagnetic induction. Maxwell's equations, electromagnetic waves. Light, wave optics, geometrical optics. Quantum properties of electromagnetic waves. Interaction of radiation with matter. Photoelectric effect. Wave-particle nature of matter. Quantum-mechanical description of particle's motion. Hydrogen atom and periodic system of elements. Spectra, x-rays, laser. Band theory of solids, semiconductors. Nucleus, radioactivity, sources of nuclear energy. Laboratories - measurements of 6 experiments related to the lectures.	Z,ZK	4
2021041	Physics I. Kinematics and dynamics of a particle motion. Principle of conservation of energy. System of particles, centre of mass. Rigid body. Continuum, elastic properties of bodies. Oscillations, waves. Fluid mechanics. Temperature and heat transfer. Kinetic theory of gases. Thermodynamics. Electric field, current, conductivity, resistance. Conductors, semiconductors, insulators. Magnetic field. Magnetic materials. Laboratories - accuracy of measurements, systematic and random errors, uncertainty of direct and indirect measurements, regression, measurements of 11 various experiments related to the lectures.	Z,ZK	7
2026016	Physics - Seminar The subject is mainly meant for high-school students for repetition of high-school physics.	Z	2

202A025	Physics II.A Faraday's law of electromagnetic induction. Maxwell's equations, electromagnetic waves. Light, wave optics, geometrical optics. Quantum properties of electromagnetic waves. Interaction of radiation with matter. Photoelectric effect. Wave-particle nature of matter. Quantum-mechanical description of particle's motion. Hydrogen atom and periodic system of elements. Spectra, x-rays, laser. Band theory of solids, semiconductors. Nucleus, radioactivity, sources of nuclear energy. Laboratories - measurements of 6 experiments related to the lectures.	ZK	2
202A041	Physics I. Kinematics and dynamics of a particle motion. Principle of conservation of energy. System of particles, centre of mass. Rigid body. Continuum, elastic properties of bodies. Oscillations, waves. Fluid mechanics. Temperature and heat transfer. Kinetic theory of gases. Thermodynamics. Electric field, current, conductivity, resistance. Conductors, semiconductors, insulators. Magnetic field. Magnetic materials. Laboratories - accuracy of measurements, systematic and random errors, uncertainty of direct and indirect measurements, regression, measurements of 11 various experiments related to the lectures.	ZK	3
2041061	English-Bachelor Exam Mapped to the Common European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulties, to take part in discussions, to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.	Z,ZK	2
2041062	German - Bachelor Exam / FME Mapped to the Common European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulties, to take part in discussions, to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.	Z,ZK	2
2041063	French - Bachelor Exam /FME Mapped to the Common European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulties, to take part in discussions, to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.	Z,ZK	2
2041064	Spanish - Bachelor Exam / FME Mapped to the Common European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulties, to take part in discussions, to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.	Z,ZK	2
2041065	Russian - Bachelor Exam / FME Mapped to the Common European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulties, to take part in discussions, to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.	Z,ZK	2
2046068	English - Beginners Aim: Basic vocabulary of everyday life in a written and spoken form. Understanding and use of basic expressions of general scientific terminology (professional language). A1	Z	2
2046069	English - Beginners Mapped to the Common European Framework of Reference Level A1 Aim: Basic vocabulary of everyday life in a written and spoken form. Understanding and use of basic expressions of general scientific terminology (professional language).	Z	2
2046070	English - Lower Intermediate Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language. A1 - A2.	Z	2
2046071	English - Lower Intermediate Mapped to the Common European Framework of Reference Level A2 Aim: Understanding clearly spoken language about everyday situations which a student meets either at school or at his/her free time and speaking about them. Writing in a simple way about familiar topics. reading and comprehension of simple texts. Improvement of professional language.	Z	2
2046072	English - Upper Intermediate The aim is to extend language skills taking into consideration professional English and common professional terminology. Comprehension of standard English speech and conversation about topics of everyday life - at school, at work, during free time, on intermediate level. Broadening grammar knowledge. A2 - B1.	Z	2
2046073	English - Upper Intermediate Mapped to the Common European Framework of Reference Level B1. The aim is to extend language skills taking into consideration professional English and common professional terminology. Comprehension of standard English speech and conversation about topics of everyday life - at school, at work, during free time, on intermediate level. Broadening grammar knowledge.	Z	2
2046074	English - Advanced The aim: comprehension of spoken English as well as lectures given in English without great difficulties and active participation in a discussion. Written and oral skills on advanced level. Ability to write a summary, a report, an essay. reading and comprehension of popular-scientific and scientific articles or texts from student's field of studies without difficulties. Grammar structures on advanced level. B1 - B2.	Z	2
2046075	English - Advanced Mapped to the Common European Framework of Reference Level B1 - B2. The aim: comprehension of spoken English as well as lectures given in English without great difficulties and active participation in a discussion. Written and oral skills on advanced level. Ability to write a summary, a report, an essay. reading and comprehension of popular-scientific and scientific articles or texts from student's field of studies without difficulties. Grammar structures on advanced level.	Z	2
2046076	German - Beginners Basic vocabulary of everyday life in a spoken and written form. Understanding and use of basic expressions of general scientific terminology (professional language)	Z	2
2046077	German - Beginners Mapped to the level Common European Framework of Reference A1 Basic vocabulary of everyday life in a written and spoken form. Understanding and use of basic expressions of general scientific terminology (professional language).	Z	2
2046078	German - Lower Intermediate Course Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.	Z	2
2046079	German - Lower Intermediate Course Mapped to the level of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a student meets either at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. reading and comprehension of simple texts. Improvement of professional language.	Z	2
2046080	German - Upper Intermediate Course Understanding standard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ability to describe experiences and events, briefly explain one's opinions and plans. Reading and understanding general and technical texts.	Z	2
2046081	German - Upper Intermediate Course Mapped to the level of Common European Framework of Reference: A2 - B1 Understanding standard speech about familiar topics, that a student comes across at work, at school, during free time, and talking about these topics. Ability to describe experiences and events, explain one's opinions and plans. Reading and understanding general and technical texts.	Z	2
2046082	German - Advanced Course Comprehension of spoken language as well as lectures in German on topics familiar to the student. Communication with native speakers, participation in discussions. Expressing opinions. Written skills. Ability to write an essay or a report. Reading and understanding texts concerning current issues and popular scientific and technical articles.	Z	2

2046083	German - Advanced Course	Z	2
Mapped to the level of Common European Framework of Reference: B1- B2 The aim: comprehension of spoken German as well as lectures given in German without great difficulties and active participation in a discussion. Written and oral skills on advanced level. Ability to write a summary, a report, an essay. Reading and comprehension of popular-scientific and scientific articles or texts from student's field of studies without difficulties. Grammar structures on advanced level.			
2046084	French - Beginners	Z	2
Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2046085	French - Beginners' Course	Z	2
Mapped to the level of Common European Framework of Reference: A1 Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2046086	French - Lower Intermediate Course	Z	2
Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2046087	French - Lower Intermediate Course	Z	2
Mapped to the level of Common European Framework of Reference: A2 Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2046088	French - Upper Intermediate	Z	2
Understanding standard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ability to describe experiences and events, briefly explain one's opinions and plans. Reading and understanding general and technical texts.			
2046089	French - Upper Intermediate	Z	2
Mapped to the level of Common European Framework of Reference: A2 - B1 Understanding standard speech about familiar topics, that a students comes across at work, at school, during free time, and talking about these topics. Ability to describe experiences and events, explain one's opinions and plans. Reading and understanding general and technical texts.			
2046090	French - Advanced	Z	2
Comprehension of spoken language as well as lectures in French on topics familiar to the student. Communication with native speakers, participation in discussions. Expressing opinions. Written skills. Ability to write an essay or a report. Reading and understanding texts concerning current issues and popular scientific and technical articles.			
2046091	French - Advanced	Z	2
Mapped to the level of Common European Framework of reference: B1 - B2 Comprehension of spoken language as well as lectures in French on topics familiar to the student. Communication with native speakers, participation in discussions. Expressing opinions. Written skills. Ability to write an essay or a report. Reading and understanding texts concerning current issues and popular scientific and technical articles.			
2046096	Spanish - Beginners	Z	2
Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2046097	Spanish - Beginners	Z	2
Mapped to the Common European Framework of Reference Level A1. Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2046098	Spanish - Lower Intermediate	Z	2
Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2046099	Spanish - Lower Intermediate	Z	2
Mapped to the level of Common European Framework of Reference A2 Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2046117	Czech -Advanced	Z	2
Comprehension of spoken language as well as lectures in Czech on topics familiar to the student. Communication with native speakers, participation in discussions. Expressing opinions. Written skills. Ability to write an essay or a report. Reading and understanding texts concerning current issues and popular scientific and technical articles.			
2046118	Czech -Advanced	Z	2
Mapped to the level of Common European Framework of Reference: B1- B2 The aim: comprehension of spoken Czech as well as lectures given in Czech without great difficulties and active participation in a discussion. Written and oral skills on advanced level. Ability to write a summary, a report, an essay. Reading and comprehension of popular-scientific and scientific articles or texts from student's field of studies without difficulties. Grammar structures on advanced level.			
2046119	Czech Language for Beginners I.	Z	2
Basic vocabulary of everyday life in a spoken and written form. Understanding and use of basic expressions of general scientific terminology (professional language)			
2046120	Czech Language for Beginners II.	Z	2
Mapped to the Common European Framework of Reference Level A1 Aim: Basic vocabulary of everyday life in a written and spoken form. Understanding and use of basic expressions of general scientific terminology (professional language).			
2046125	Czech Lower Intermediate	Z	2
Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2046126	Czech Lower Intermediate	Z	2
Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2046127	Czech - Upper Intermediate	Z	2
Understanding standard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ability to describe experiences and events, briefly explain one's opinions and plans. Reading and understanding general and technical texts.			
2046128	Czech - Upper Intermediate	Z	2
Mapped to the Common European Framework of Reference Level A2-B1. The aim is to extend language skills taking into consideration professional Czech and common professional terminology. Comprehension of standard Czech speech and conversation about topics of everyday life - at school, at work, during free time, on intermediate level. Broadening the knowledge technical language.			
2046135	Russian - Beginners	Z	2
Basic vocabulary of everyday life in a spoken and written form. Understanding and use of basic expressions of general scientific terminology (professional language)			
2046136	Russian - Beginners	Z	2
Mapped to the level of Common European Framework of Reference: A1 Basic vocabulary of everyday life in a spoken and written form. Understanding and use of basic expressions of general scientific terminology (professional language)			

2046137	Russian - Lower Intermediate Course Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.	Z	2
2046138	Russian - Lower Intermediate Course Mapped to the level of Common European Framework of Reference: A2 Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.	Z	2
2046139	Russian - Upper Intermediate Understanding standard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ability to describe experiences and events, briefly explain one's opinions and plans. Reading and understanding general and technical texts.	Z	2
2046140	Russian - Upper Intermediate Mapped to the level of Common European Framework of Reference: A2 - B1 Understanding standard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ability to describe experiences and events, briefly explain one's opinions and plans. Reading and understanding general and technical texts.	Z	2
2046141	Russian - Advanced Comprehension of spoken language as well as lectures in Russian on topics familiar to the student. Communication with native speakers, participation in discussions. Expressing opinions. Written skills. Ability to write an essay or a report. Reading and understanding texts concerning current issues and popular scientific and technical articles.	Z	2
2046142	Russian - Advanced Mapped to the level of Common European Framework of reference: B1 - B2 Comprehension of spoken language as well as lectures in Russian on topics familiar to the student. Communication with native speakers, participation in discussions. Expressing opinions. Written skills. Ability to write an essay or a report. Reading and understanding texts concerning current issues and popular scientific and technical articles.	Z	2
2046155	English Conversation Improving communicative skills in speaking on general topics and general technical topics.	Z	2
2046156	English Conversation Improving communicative skills in speaking on general topics and general technical topics.	Z	2
2046161	Presentations in English Preparing students to present in English on technical topics, with a possible co-operation with specialized departments.	Z	2
2046162	Presentations in German Preparation for presenting technical topics in German, possibly in cooperation with specialized departments.	Z	2
2046163	Presentations in French language Preparation for presenting technical topics in French, possibly in cooperation with specialized departments.	Z	2
2046164	Presentations in Russian Preparation for presenting technical topics in Russian, possibly in cooperation with specialized departments.	Z	2
2046165	Presentations in Spanish Preparation for presenting technical topics in Spanish, possibly in cooperation with specialized departments.	Z	2
2046166	Presentations in Czech Preparing students to give presentations in English on technical topics, with a possible co-operation with specialized departments.	Z	2
2131002	Engineering Design II Principles of ISO GPS (Geometrical Products Specification). Students will get critical knowledge about ISO system of limits and fits, tolerancing, surface texture, geometrical tolerance, dimensional loops, tolerancing of angles and cones, tolerancing of threads. Integral part of course is a project where students apply and practice their knowledge from lectures.	Z,ZK	4
2131026	Machine Elements and Mechanisms II Preliminary design, design calculations and application of axles and shafts, sliding and rolling bearings, shaft connections, elements of crank mechanism, pipelines and their accessories and fittings.	ZK	3
2131512	Machine Elements and Mechanisms I. Joints and joining elements (screwed, clamped, splined, welded, riveted, soldered and adhesive joints; joints with use of feathers, pins, tenons, cotters, keys). Mechanical transmissions (belt, chain, friction, gear drives). Seminars are devoted to practical individual solution of simple design projects - tasks with motion screws, preloaded connecting bolts, clamped, pressed, splined and key joints between shafts and hubs and tasks with welded and riveted joints. Sketching of machine elements and their simple assembly units is also indispensable seminar work.	Z,ZK	6
2133013	Engineering Design III. Design of assembly unit (draft drawing, detail drawing, assembly drawing, technical report)	Z	2
2133014	Engineering Design IV.	Z	2
2133025	Design Design, design calculations and their applications in case of geared transmissions, axles and shafts, sliding and rolling bearings, shaft couplings and clutches.	Z	4
2141504	Electric Circuits and Electronics Introduction into theory of electrical circuits, analysis special types of electrical circuits as DC and AC. Transient states in circuits with accumulators of energy. El. Power and Energy. Introduction into electronics. Principle and typical parameters of basic semiconductor components. Application in electronic circuits (rectifier, stabilizer, power control, operational amplifier). Analogue and digital circuits. Principle of analogue and digital signal processing. Logical circuits, converters, microprocessor.	Z,ZK	4
2141505	Electrical machines and drives AC el. circuits. Electrical power and energy. Calculation, measurement, power factor. Magnetic circuit, materials, hysteresis loop. Electromagnet. Transformer, principle, construction, 3-phase transformer, operating conditions, rated (scheduled) values. Induction machine, principle, construction, operating conditions. Starting, speed-torque characteristic, speed control. Synchronous machines. DC-machines, principle, parameters, operating conditions, construction, starting, speed control, speed-torque characteristic. Low-voltage instruments. Low-voltage distribution system.	Z,ZK	4
2144062	Technical Indonesian - Course II. Basic of Indonesian Language for Student Exchange Program to Indonesia	Z,ZK	3
2146060	Indonesian Language Course for Exchange Basic of Indonesian Language for Student Exchange Program to Indonesia	Z	2
2146061	Technical Indonesian - Course I. Second part of Indonesian Language for Student Exchange Program to Indonesia	Z	2
2151002	Nuclear Power Principles Physical fundamentals of nuclear energy. Development and heat removal from core. Basic materials for nuclear reactors. Basic types of nuclear reactors. Review of advanced types of nuclear reactors. Fuel cycle. Reactor radiation, detection and quantification, determination of radiation doses. Problems of nuclear safety and technical provisions.	Z,ZK	5
2151090	Industry power and heating plant	Z,ZK	5

2151117	Design of Power Facilities	Z,ZK	5
2151118	Distributed Energy	Z,ZK	5
2151158	Principles of Refrigerating Technology and Heat Pumps	Z,ZK	5
2151165	Hydraulic and Pneumatic Machines	Z,ZK	5
Classification and principles of operation of hydraulic machines. Criteria of hydrodynamical similarity. Hydraulic systems. Different types of pumps, construction, capacity control and operation in various conditions. Theory of compression processes. Constructions, calculation, capacity control of compressors, operation with various gases. Refrigerating compressors. Accessories of a compressor stations and plants. Economical and ecological problems of a compressed air production and distribution.			
2151554	Thermal Turbines	Z,ZK	5
2151559	Heat Exchangers and Boilers	Z,ZK	5
2151702	Renewable Energy Sources	Z,ZK	5
2152028	Energy Audit and Legislation	KZ	5
2152091	Departmental Project	KZ	2
2153005	Fundamentals of Energy Conversions	Z	1
2153006	Technology of Air Protection in Power Engineering	Z	2
2153091	Presentation of Project	Z	4
2153707	Project I.	Z	5
2153985	Bachelor Thesis	Z	5
2181026	Momentum, Mass and Heat Transfer	Z,ZK	5
Fundamentals of transport phenomena balances in homogeneous fluids. Navier-Stokes equations. Momentum transport in turbulent flows. Mechanical energy equation. Residence time distributions in continuous systems. Conduction heat transfer. Forced and natural convection heat transfer. Heat transfer with phase changes and thermal radiation. Multicomponent systems. Mass transfer by molecular diffusion, convection, with chemical reactions and interphase mass transfer.			
2181502	Hydromechanical Equipment	Z,ZK	5
Design, principles and basic calculations of following equipment: pipes and pipe networks, packed and bubble columns, filters, settlers, centrifuges and cyclones, fluidized beds, mixing equipment, silos and conveyors, crushers and mills, granulators, extruders, injection and blow moulding machines, rolls and calendars.			
2181507	Diffusion separation equipment	Z,ZK	5
Classis from Equipment for diffusion separation processes are giving a basic knowledge of processes and equipments where gas or liquid mixture is been separated due to principals of physical-chemical equilibriums or on the basis of mass transfer mechanisms. They are used for concentrating of products from dilute solutions or in turn for purification of diluted gasses or liquid solutions.			
2181508	Heat transfer equipments	Z,ZK	5
Fundamentals of thermodynamics and conductive and convective heat transfer. Enthalpy balancing. Technical thermodynamics and basic thermodynamic cycles. Functional description, mechanical design, thermal and hydraulic design of a heat exchangers, evaporators and dryers.			
2182019	Chemistry	KZ	3
General chemistry from the point of view of mechanical and process engineering. Physical chemistry forms 2/3 of the course (structure and properties of matter, thermodynamics, phase equilibrium, chemical reactions, reaction engineering), the remaining 1/3 is devoted to organic chemistry (hydrocarbons, polymers) and biochemistry. Laboratory practice is oriented upon the material properties measurement.			
2182091	Project	KZ	2
Absolvent se seznámí se základy oboru Procesní technika.			
2183091	Project Presentation	Z	4
Preparation and presentation of a given project theme.			
2183707	Project I.	Z	5
Project, dimensioning and designing solution of basic elements for process technology.			
2183985	Bachelor Thesis	Z	5
Bachelor thesis is final individual work. This work checks ability of logical independent technical thinking and treatment with technical materials. There is applied acquired knowledge from previous study periods.			
2311101	Mechanics I.	Z,ZK	4
Mechanics I deals with the basic concepts of statics. There are described the methods of solution of equilibrium of particles and rigid bodies and their systems with and without friction. There are introduced the methods of description of position and motion of particles and rigid bodies.			
2311102	Mechanics II.	Z,ZK	4
Kinematics of point and of rigid bodies. Transformation matrix. Kinematics of concurrent movements. Motion: translation, rotation, general planar motion, spherical motion, screw motion, general spatial motion. Composition of mechanisms. Basic planar mechanisms. Analytical methods in kinematics of mechanisms - Trigonometric and vector method. Graphical methods in kinematics. Basic theory of gearing. Transmission mechanisms with gears. Strutting and seeing in mechanisms. Cable mechanisms.			
2321039	Materials Science II.	Z,ZK	4
Fundamentals of metallurgy, iron-carbon alloys and influence of other elements, phase transformations, thermal, combined chemical and thermal and thermo-mechanical processing, technical iron-carbon alloys, non-ferrous metals and their alloys, plastics, structural ceramics, composites, selection of materials.			
2322029	Materials Science I.	KZ	3
History and present state of materials engineering, overview of technical materials, internal structure of metals, crystal lattices and their defects, deformation, recrystallization and fracture of materials, structure and properties of materials and their testing, fundamentals of thermodynamics, phases and phase transformations, iron-carbon phase diagram.			
2331068	Technology I.	Z,ZK	5
Foundry properties of metals. Treatment. Pouring. Casting solidification. Moulding and core making. Thermal treatment. Plastic deformation. Division of forming processes. Semi-products, heating-up. Cutting. Cold and hot forming. Welds. Weldability. Weldment testing. Thermal cutting. Brazing. Surface treatments.			
2333038	Fundamentals of Technology I.	Z	3
Production processes in engineering production. Technology of engineering production. Materials in engineering. Concepts of steel and cast iron, technical metals. Production of pig iron and steel. Casting: modelling devices, molding materials, molding and castings. Foundry alloys. Overview of basic casting technology. Forming technology. Hot and cold forging. Free and drop forging. Rolling. Production of pipes. Bulk and sheet metal forming. Welding technology. The characteristics of the various types of welding. Fusion welding: Flame welding and arc welding with coated electrodes. Thermal cutting.			
2341014	Technology II.	Z,ZK	5
mechanics of chip formation, cutting processes, finishing operations, non-traditional machining processes. Production rates calculation, machining economics. Automation of processes, programming of manufacture. Engineering metrology. Assembly techniques. Introduction to process planing.			
2362091	Project	KZ	2

2363091	Project Presentation	Z	4
2371047	Automatic Control Automatic controllers are important part of many industrial processes. The goal of this course is to introduce students into basic knowledge of automatic control theory and practice like transfer functions, open versus closed loop control, design of controllers and frequency based analysis of control systems. The course also concentrates on logic control and control via programmable logic controllers. Some seminars are arranged in laboratories where practical skills and control engineering methods are trained. Students begin to work with MATLAB software as a common platform of control engineers.	Z,ZK	5
2372041	Computer Support for Study The course introduces students into creating technical and professional documents on computers or Web and into realizing technical computations with the use of computers. Students gain practical skills by creating an essay in a text editor, by realizing technical computations with a spreadsheet calculator, and by creating technical-based WWW page.	KZ	3
2372083	Measurement in Engineering Overview of sensor principles for measurement of non-electrical variables (temperature, position, force, speed, acceleration, torque). Calibration and verification of measurement instruments.	KZ	3
2372091	Project An individual project from the branch of specialisation, which student will study on his/her magister level	KZ	2
2373091	Project presentation Diploma thesis or bachelor work presentation. Student should study the presentation software possibilities and proposition of the department. Student should prepare the presentation of actual version of his diploma or bachelor work and present it in the face of the other student. The presentation will continue with discussion. Consequently, the work should be presented as a pdf file on a temporal web page.	Z	4
2381054	Management and Economics of the Enterprise The subject is intended to teach the students of the Faculty of Mechanical Engineering the basic economic starting points necessary for technical reasoning and to help them understand the basic relationships between economic quantities costs - revenues, expenses - incomes and other basic economic terms. The goal is for the audience to be able to communicate with economists in organizations. every product or service is valued at a selling price and therefore it is necessary to understand the simple costing of products and services. Every technician will encounter reports and should understand the basic structure of financial statements. As a future manager, he will compile and approve the operating budget. In the field of management, they will learn basic managerial functions and their content. Furthermore, they will learn how to use network analysis in project management. For decision-making purposes, they will learn the applications of multi-criteria decision-making. The basics of marketing and strategic management will be introduced.	Z,ZK	4
2383001	Fundamentals of Law Basic orientation in legal system is a necessary part of professional equipment of each expert with university degree. The aim of this course is to provide a view into the Czech Legal Order, particular sources of law and system of law (branch of law), using tutorials, lectures, specialised literature and significant legal regulations. It is necessary for students to know our legal institutions, that will be regularly in touch with, especially during their professional career and to learn how to work with the collection of laws. At the same time the course leads students to know some practical habits and processes while putting the law on, especially in domain of contracts and other important legal relationships and to make them ready to prepare professional presentations and to understand basic structures between law and engineering	Z	2
2383009	Communication and Dealing with People Human communication represents an irreplaceable phenomenon in human activity, as it is present in practically all of his activities. The same applies (with specific modifications) to the activities of managers. So you can't not communicate - you can only communicate badly, well and excellently.	Z	2

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