

## Study plan

### Name of study plan: 14 80 85 00 DVES MAT 2012 P

Faculty/Institute/Others:

Department:

Branch of study guaranteed by the department: Welcome page

Garantor of the study branch:

Program of study: Manufacturing and Economy in Mechanical Engineering

Type of study: Bachelor full-time

Required credits: 116

Elective courses credits: 65

Sum of credits in the plan: 181

Note on the plan: SP12DVES-MUSTR # SP12BVES-EKO-P # první pokus

Name of the block: Compulsory courses in the program

Minimal number of credits of the block: 107

The role of the block: P

Code of the group: 12BVP4P

Name of the group: 09 2012 BVES 4.sem prezen ní povinné

Requirement credits in the group: In this group you have to gain 22 credits

Requirement courses in the group: In this group you have to complete 5 courses

Credits in the group: 22

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
2381075	<b>Enterprise Management and Economics</b>	Z,ZK	5	2P+2C	4	P
2383102	<b>Personnel Management</b>	Z	2	2P+1C	*	P
2342005	<b>Quality Control</b> <i>Jan Podaný</i>	KZ	2	1P+1C+1L	*	P
2341014	<b>Technology II.</b> <i>Pavel Novák</i>	Z,ZK	5	2P+0C+2L	*	P

#### Characteristics of the courses of this group of Study Plan: Code=12BVP4P Name=09 2012 BVES 4.sem prezen ní povinné

2381075	Enterprise Management and Economics	Z,ZK	5
2383102	Personnel Management	Z	2
Personnel / human resource management is concerned with the effective management of people at work. Subject examines what can or should be done to make people both more productive and more satisfied with their working life. Its goal is to help develop more effective managers and staff specialists who work directly with the human resources of organizations.			
2342005	Quality Control	KZ	2
Basic quality control terms, where is quality created, who is responsible for a quality. Basic statistical terms and distributions. Statistical methods: statistical process control, statistical sampling. Tools and methods for a quality assurance during product lifetime cycle. Standards 9 000 and 14 000, certification of quality control systems.			
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 planning.			

Code of the group: 12BV\*5P

Name of the group: 12 2012 BVES 5.sem povinné

Requirement credits in the group: In this group you have to gain 11 credits

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

Credits in the group: 11

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
2131519	<b>Machine Elements for Technology</b> <i>Martin Dub, Eliška Cézová, Zdeněk ešpíro, Martin Havlíček, Jiří Houkal, Jan Kanaval, František Lopot, Ondřej Štoček, Roman Uhlíř František Lopot František Lopot (Gar.)</i>	Z,ZK	5	2P+3C	*	P
2381068	<b>Cost Accounting</b> <i>Theodor Beran, Ladislav Vaniš Theodor Beran Theodor Beran (Gar.)</i>	Z,ZK	5	2P+2C	*	P
2141204	<b>Introduction to Electrical Engineering for Technology</b> <i>Jan Chyský, Lubomír Musálek, Martin Novák Lubomír Musálek Jan Chyský (Gar.)</i>	Z,ZK	4	2P+0C+2L	*	P
2383001	<b>Fundamentals of Law</b> <i>Václav Pilík Václav Pilík (Gar.)</i>	Z	2	1P+1C	*	P

**Characteristics of the courses of this group of Study Plan: Code=12BV\*5P Name=12 2012 BVES 5.sem povinné**

2131519	Machine Elements for Technology	Z,ZK	5
2381068	Cost Accounting	Z,ZK	5
The subject presents an introduction to the problems of value management as the enterprise on the whole and its parts - centres - by means of budgeting (expected cost), so the individual achievements (intermediate products, products, services) - by means of preliminary costing (expected costs) and actual costing (actual costs). Emphasis is laid on the relation of costs on the whole - enterprise costs - to the costs of individual achievements and the understanding of the transformation from costs in the budgeting and accounting structure (individual cost items) into the costing structure (direct and overhead costs), and fixed and variable costs. There are taught conventional and also modern approaches in costing. The subject Cost Accounting is connected directly with the subject Accounting and represents an introduction to the problems of cost allocation to separate products, which are compared with the market price and finding out as their profitability, so their acceptability or unacceptability manufacturing program.			
2141204	Introduction to Electrical Engineering for Technology	Z,ZK	4
Elements of electrical circuits, analysis of electrical circuits as DC and AC. EI. Power and Energy. Principle and typical parameters diodes, transistors, thyristors, operation amplifiers. Analogue and digital circuits. AC el. circuits. Electrical power and energy. Calculation, measurement, power factor. Transformer. Induction machines. Synchronous machines. DC-machines			
2383001	Fundamentals of Law	Z	2
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			

Code of the group: 12BV\*5P-MAT

Name of the group: 14 2012 BVES 5.sem zam MAT povinné

Requirement credits in the group: In this group you have to gain 18 credits

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

Credits in the group: 18

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
2341001	<b>Metrology</b> <i>Libor Beránek, Petr Mikeš Pavel Novák Libor Beránek (Gar.)</i>	Z,ZK	5	2P+0C+2L	*	P
2331505	<b>Welding Technology</b> <i>Ladislav Kolařík, Marie Kolaříková, Pavel Rohan Ladislav Kolařík Ladislav Kolařík (Gar.)</i>	Z,ZK	4	2P+1C	*	P
2322041	<b>Heat treatment</b> <i>Jana Sobotová, Martin Kuřík Jana Sobotová Jana Sobotová (Gar.)</i>	KZ	4	2P+1C	*	P

**Characteristics of the courses of this group of Study Plan: Code=12BV\*5P-MAT Name=14 2012 BVES 5.sem zam MAT povinné**

2341001	Metrology	Z,ZK	5
Metrology, intergration into quality control, legal metrology, metrology system. Geometrical quantities metrology. Measurement uncertainty. Primary and secondary standards. Measurement in 1, 2, and 3 coordinates. Laserinterferometres and their applications. Geometrical surface properties. Form - and position deviations. Surface structure - roughness, waviness. Measurement automatisation.			
2331505	Welding Technology	Z,ZK	4
2322041	Heat treatment	KZ	4
Theoretical fundamentals of heat treatment, basic processes of heat and chemical-heat treatment of ferrous and non-ferrous metals, excursion focused on the given topic			

Code of the group: 12BV\*6P

Name of the group: 15 2012 BVES 6.sem povinné

Requirement credits in the group: In this group you have to gain 9 credits

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

Credits in the group: 9

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
2331071	<b>Automation of Production Processes</b> Ladislav Kolařík, Jaroslav Červený, Aleš Herman, Viktor Kreibich, Jiří Kuchař, Vít Novák, František Tatíček <b>Aleš Herman</b> Aleš Herman (Gar.)	Z,ZK	5	3P+2C	*	P
2381098	<b>Enterprise Finance</b> František Freiberg <b>František Freiberg</b> František Freiberg (Gar.)	Z,ZK	4	2P+2C	*	P
2382048	<b>Statistical and Decision Analysis</b> Barbora Stieberová <b>Barbora Stieberová</b> Barbora Stieberová (Gar.)	KZ	4	2P+1C	*	P

**Characteristics of the courses of this group of Study Plan: Code=12BV\*6P Name=15 2012 BVES 6.sem povinné**

2331071	Automation of Production Processes	Z,ZK	5	Automation of basic technological processes - casting, welding, forming and finishing. Facilities and equipment required to automate offices. Mechanization and automation in iron and steel foundries. Automation and robotics of die casting process, including other peripherals. Designing and programming of robotic welding centers. Designing and programming of robotic workstations for sheet metal forming. Design of automated forging cells. Design of automated finishing lines.		
2381098	Enterprise Finance	Z,ZK	4	The subject Financing of the Enterprise provides a broad-based introduction to financial management. Students have an opportunity to acquire an understanding of the main concepts and their practical application in decision-making. Students gain knowledge of financial management role within a business, financial ratios, nature and purpose of projected financial statements and their role in the development of future plans for a business and in the assessing the impact of management decision on the performance and position of a business, factors which must be taken into account when managing the working capital of a business, various aspects of financing the business through external and internal sources of finance available to a business, ways how business can make decision and evaluation involving investments in new technology, and various aspects of mergers and takeovers.		
2382048	Statistical and Decision Analysis	KZ	4	Statistical analysis is a good basis for a creation of decision-making models. The goal of this subject is to teach students to apply the selected statistical method, to apply models of decision analysis, to create models for the management of industrial enterprises.		

Code of the group: 12BV\*6P-MAT

Name of the group: 16 2012 BVES 6.sem zam MAT povinné

Requirement credits in the group: In this group you have to gain 22 credits

Requirement courses in the group: In this group you have to complete 5 courses

Credits in the group: 22

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
2323993	<b>Bachelor Thesis</b> Jana Sobotová	Z	5	0P+6C	*	P
2321501	Jiří Janovec, Jakub Horváth, Lucie Pílsková <b>Jana Sobotová</b> Jakub Horváth (Gar.)	Z,ZK	4	3P+1C	*	P
2381174	<b>Enterprise Information Systems</b> Vladimír Brdek	Z,ZK	4	2P+2C	*	P
2321503	<b>Technical testing of materials</b> Jiří Cejpa, Elena Ižmárová <b>Elena Ižmárová</b> Elena Ižmárová (Gar.)	Z,ZK	5	2P+2C+0L	*	P

**Characteristics of the courses of this group of Study Plan: Code=12BV\*6P-MAT Name=16 2012 BVES 6.sem zam MAT povinné**

2323993	Bachelor Thesis	Z	5			
2321501		Z,ZK	4	The course characterizes individual groups of new construction materials. In addition to the development and physical nature of these materials, the most commonly used types of recently developed materials, their basic characteristics and mechanical properties are listed. Their technological possibilities, design applicability and methods of their designations are also presented.		
2381174	Enterprise Information Systems	Z,ZK	4			
2321503	Technical testing of materials	Z,ZK	5	Term and definition of properties. Verification of properties in a certified quality management system. Accredited test laboratory and test systems, test standard. Basic mechanical properties and testing the characteristics of metals, polymers, composites and ceramics. Testing of material for the limited state is the basic methods in accordance with the relevant standards. Test of resistance to brittle fracture, fatigue, creep. Evaluation of technological properties. Defectoscopic method for detecting defects in the material.		

Code of the group: 12DVP1P-KMEN

Name of the group: 00 2012 D kmenové 1. semestr VES prezen ní

Requirement credits in the group:

Requirement courses in the group:

Credits in the group: 0

Note on the group:

12B\*\*1P-KMEN #

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
2182019	<b>Chemistry</b> Radek Šulc, Martin Dostál, Vojtěch B. Iohlav, Stanislav Solna, Jan Skořilas Radek Šulc Radek Šulc (Gar.)	KZ	3	2P+1C	1	P
2011021	<b>Constructive Geometry</b> Ivana Linkeová	Z,ZK	6	3P+2C	*	P
2383008	<b>Managerial Psychology</b>	Z	2	1P+1C	*	P
2011056	<b>Mathematics I</b> Radka Keslerová, Marta Hlavová, Jiří Holman, Gejza Dohnal, Marta Bertíková, Vladimír Hříc, Nikola Pajerová, Petr Louda, Lukáš Hájek, ..... Radka Keslerová Gejza Dohnal (Gar.)	Z,ZK	8	4P+4C	*	P
2372041	<b>Computer Support for Study</b>	KZ	3	1P+1C	*	P
2132001	<b>Engineering Design I.</b> Karel Petr	KZ	2	1P+2C	1	P
2131005	<b>History of Technology</b>	ZK	3	2P+0C	1	P

**Characteristics of the courses of this group of Study Plan: Code=12DVP1P-KMEN Name=00 2012 D kmenové 1. semestr VES prezen ní**

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.		
2011021	Constructive Geometry	Z,ZK	6	The subject is focused on geometric objects in the space - curves, surfaces and solids and their properties and mutual relations.		
2383008	Managerial Psychology	Z	2			
2011056	Mathematics I	Z,ZK	8	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.		
2372041	Computer Support for Study	KZ	3	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.		
2132001	Engineering Design I.	KZ	2	Basic of technical representation, dimensioning and tolerancing		
2131005	History of Technology	ZK	3	Development of human knowledge in the domain of science and technology in the retrospective of the development of our civilization. Emphasis is given upon new branches of technology with special attention to the contribution of mining, iron metallurgy, power engineering, transportation and of the machine industry in the narrower sense of the word.		

Code of the group: 12DVP2P-KMEN

Name of the group: 00 2012 D kmenové 2. semestr VES prezen ní

Requirement credits in the group: In this group you have to gain 25 credits

Requirement courses in the group: In this group you have to complete 5 courses

Credits in the group: 25

Note on the group: 12B\*\*2P-KMEN #

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
2021041	<b>Physics I.</b>	Z,ZK	7	4P+1L	*	P
2011062	<b>Matematika II.</b> Radka Keslerová	Z,ZK	8	4P+4C	*	P
2322029	<b>Materials Science I.</b> Jana Sobotová, Jakub Horváth, Lucie Písová, Jiří Cejp, Elena Ižmárová, Jakub Horník, Eliška Galíková, Pavlína Hájková, Stanislav Krum, ..... Jana Sobotová Jana Sobotová (Gar.)	KZ	3	2P+1L	2	P
2012037	<b>Computer Graphics</b> Marta Hlavová, Jiří Holman, Nikola Pajerová, Martin Hanek, Jan Karel, Ivana Linkeová, Jaroslav Cibulka Ivana Linkeová Ivana Linkeová (Gar.)	KZ	3	1P+1C	*	P
2333017	<b>Surface Treatment</b> Jan Kudláček	Z	3	1P+1C	*	P
2131002	<b>Engineering Design II</b> Martin Dub, Martin Havlíček, Jan Kanaval, Jan Flek, Karel Petr, Jan Hoidekr Karel Petr Karel Petr (Gar.)	Z,ZK	4	2P+3C	2	P
2333038	<b>Fundamentals of Technology I.</b> Marie Kolaříková	Z	3	1P+1C	*	P

**Characteristics of the courses of this group of Study Plan: Code=12DVP2P-KMEN Name=00 2012 D kmenové 2. semestr VES prezen ní**

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
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
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
2012037	Computer Graphics	KZ	3
2333017	Surface Treatment Introduction to the surface treatments - branch signification and objects. Principles of corrosion, types and corrosion distribution. Anticorrosive prevention in manufacturing, method anticorrosive prevention. Corrosion testing. Surface pre-treatment. Converse coatings, enamels. Inorganic coatings, electroplating, hot-dip galvanizing. Organic coatings. Ecological aspects of surface treatments.	Z	3
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
2333038	Fundamentals of Technology I. 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.	Z	3

Code of the group: 12DVP3P-KMEN

Name of the group: 00 2012 D kmenové 3. semestr redukované pro VES prezen ní

Requirement credits in the group:

Requirement courses in the group:

Credits in the group: 0

Note on the group:

12BV\*3P-KMEN-R #

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
2021025	Physics II.	Z,ZK	4	1P+2L	3	P
2011009	Mathematics III Radka Keslerová, Ji í Holman, Gejza Dohnal, Marta ertíková, Vladimír Hric, Jan Valášek, Lud k Beneš, Tomáš Bodnár, Tomáš Neustupa, ..... Stanislav Kra mar Stanislav Kra mar (Gar.)	Z,ZK	5	2P+2C	*	P
2311004	Mechanics for Technology	Z,ZK	7	4P+2C	*	P
2321039	Materials Science II. Jana Sobotová, Martin Ku ík, Ji í Janovec, Jakub Horváth, Lucie Pilslová, Ji í Cejp, Elena ížmárová, Jakub Horník, Eliška Gal íková, ..... Jana Sobotová (Gar.)	Z,ZK	4	2P+2L	*	P
2331068	Technology I. Jan Kudlá ek	Z,ZK	5	2P+2C	*	P
2121023	Thermodynamics	Z,ZK	5	3P+2C	*	P

Characteristics of the courses of this group of Study Plan: Code=12DVP3P-KMEN Name=00 2012 D kmenové 3. semestr redukované pro VES prezen ní

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
2011009	Mathematics III An introductory course in ordinary differential equation and infinite series.	Z,ZK	5
2311004	Mechanics for Technology	Z,ZK	7
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
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

2121023	Thermodynamics	Z,ZK	5
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The course deal with a basic engineering approach to classical thermodynamics, heat transfer and compressible flow through nozzles and diffusers. Basic concepts and principles are introduced, and they are applied mostly to systems behaving as ideal gases or typical vapours. Basic notions associated with ideal mixtures are studied with an emphasis on psychometrics. Heat transfer covers fundamentals of conduction, convection and radiation. Heat exchangers are treated as an engineering application. Exercises and labs are devoted to practical problems and experimental technique.

Name of the block: Compulsory elective courses

Minimal number of credits of the block: 9

The role of the block: PV

Code of the group: 12BV\*4Q-BZJ VES

Name of the group: 11 2012 bakalá ské zkoušky z jazyk pro VES

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:

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

Characteristics of the courses of this group of Study Plan: Code=12BV\*4Q-BZJ VES Name=11 2012 bakalá ské zkoušky z jazyk pro VES

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: 12BV\*4Q-ZAM

Name of the group: 10 2012 BVES 4.sem zam 1povvol

Requirement credits in the group: In this group you have to gain at least 5 credits (at most 10)

Requirement courses in the group: In this group you have to complete at least 1 course ( at most 2)

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) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
2321067	<b>Technical Application of Materials</b> Stanislav Krum	Z,ZK	5	3P+1C	*	PV
2381002	<b>Fundamentals of Economics</b> Theodor Beran <b>Theodor Beran Theodor Beran (Gar.)</b>	Z,ZK	5	2P+2C	*	PV

Characteristics of the courses of this group of Study Plan: Code=12BV\*4Q-ZAM Name=10 2012 BVES 4.sem zam 1povvol

2321067	Technical Application of Materials	Z,ZK	5
P edm t popisuje aplikovatelnost jednotlivých skupin inženýrských materiál ů a jejich odpovídající vlastnosti. Rovn ě se v nuje aktuálním vývojovým trend m t chto skupin. The subject describes applicability of specific engineering material types and their characteristics. It deals with the current development trends in these materials as well.			
2381002	Fundamentals of Economics	Z,ZK	5
The course is focused on the following subjects: basic economic relations and consequences. Economic aggregates and their consequences. Operating of the economics according to so called macroeconomic circle, various economic theories. Consumption behaviour in microeconomics. Theory of production. Different markets and competitions.			

Code of the group: 12BV\*5Q-OP

Name of the group: 13 2012 BVES 5.sem 1povvol oborové projekty

Requirement credits in the group: In this group you have to gain at least 2 credits (at most 8)

Requirement courses in the group: In this group you have to complete at least 1 course ( at most 4)

Credits in the group: 2

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
2322091	<b>Project</b> Jana Sobotová, Ji í Janovec, Jakub Horváth, Ji í Cejp, Elena ížmárová, Jakub Horník, Pavlína Hájková, Stanislav Krum, Jan Kr il, ..... <b>Jana Sobotová</b> Jana Sobotová (Gar.)	KZ	2	0P+2C	*	PV
2382091	<b>Specialization Project</b> Ladislav Vaniš, Barbora Stieberová, Vladimír Brdek <b>František Freiberg</b>	KZ	2	0P+2C	*	PV
2332091	<b>Project</b> Ladislav Kola ík, Marie Kola íková, Pavel Rohan, Tomáš Gur ík, Jaroslav ervený, Aleš Herman, Viktor Kreibich, Ji í Kucha, František Tatí ek, ..... <b>Ladislav Kola ík</b> Aleš Herman (Gar.)	KZ	2	0P+2C	*	PV
2342091	<b>Project</b> Libor Beránek, Michal Koptiš, Petr Mikeš, Jan Šimota, Jan Urban, Vladislav Andronov, František Holešovský, Tomáš Kellner, Ji í Kyncl, ..... <b>Pavel Novák</b> Jan Podaný (Gar.)	KZ	2	0P+2C	*	PV

Characteristics of the courses of this group of Study Plan: Code=12BV\*5Q-OP Name=13 2012 BVES 5.sem 1povvol oborové projekty

2322091	Project	KZ	2
On the basis of the preliminary submission of a bachelor thesis the students, under supervision of their supervisors, prepare a review summarizing and evaluating the studied literature with particular emphasis on experimental technologies which can be applied in their bachelor theses. They can also mention a planned experiment or evaluate hitherto obtained knowledge or results.			
2382091	Specialization Project	KZ	2
2332091	Project	KZ	2
2342091	Project	KZ	2
Work on specialized tasks.			

Name of the block: Elective courses

Minimal number of credits of the block: 0

The role of the block: V

Code of the group: 12BV\*\*V-ALFA

Name of the group: 02 2012 ALFA volitelné pro VES

Requirement credits in the group:

Requirement courses in the group:

Credits in the group: 0

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
202A041	<b>Physics I.</b>	ZK	3	0P+0L	*	V
201A021	<b>Constructive Geometry A</b> Ivana Linkeová	ZK	3	0P+0C	*	V
201A056	<b>Mathematics I.A</b> Radka Keslerová	ZK	4	0P+0C	*	V
201A062	<b>Mathematics II.A</b> Radka Keslerová	ZK	4	0P+0C	*	V

Characteristics of the courses of this group of Study Plan: Code=12BV\*\*V-ALFA Name=02 2012 ALFA volitelné pro VES

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
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 <sup>3</sup> , calculus of functions of one variable	ZK	4
201A062	Mathematics II.A Open and closed set, boundary in E <sup>k</sup> . 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

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) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
2026016	Physics - Seminar	Z	2	0P+2C	1	v
2016007	Mathematics I. - Seminar Radka Keslerová, Olga Majlingová Radka Keslerová Gejza Dohnal (Gar.)	Z	2	0P+2C	1	v

Characteristics of the courses of this group of Study Plan: Code=12B\*\*1V-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) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
2046155	English Conversation Michele Le Blanc, Ilona Šimice Ilona Šimice Michele Le Blanc (Gar.)	Z	2	0P+2C	*	v
2046156	English Conversation Michele Le Blanc, Ilona Šimice Nina Procházková Ayyub	Z	2	0P+2C	L	v
2046071	English - Lower Intermediate Michaela Schusová, Ilona Šimice, Hana Volejníková, Veronika Kratochvílová	Z	2	0P+2C	L	v
2046070	English - Lower Intermediate Michaela Schusová, Ilona Šimice, Hana Volejníková, Veronika Kratochvílová Michaela Schusová Ilona Šimice (Gar.)	Z	2	0P+2C	Z	v
2046074	English - Advanced Michele Le Blanc, Michaela Schusová, Ilona Šimice, Hana Volejníková, Veronika Kratochvílová Michaela Schusová Ilona Šimice (Gar.)	Z	2	0P+2C	Z	v
2046075	English - Advanced Michele Le Blanc, Michaela Schusová, Ilona Šimice, Hana Volejníková, Veronika Kratochvílová Ilona Šimice	Z	2	0P+2C	L	v
2046072	English - Upper Intermediate Michaela Schusová, Ilona Šimice, Hana Volejníková, Veronika Kratochvílová Michaela Schusová Ilona Šimice (Gar.)	Z	2	0P+2C	Z	v
2046073	English - Upper Intermediate Michaela Schusová, Ilona Šimice, Hana Volejníková, Veronika Kratochvílová Ilona Šimice	Z	2	0P+2C	L	v



2046068	<b>English - Beginners</b> Michaela Schusová, Ilona Šimice, Hana Volejníková, Veronika Kratochvílová <b>Michaela Schusová</b> Ilona Šimice (Gar.)	Z	2	0P+2C	Z	v
2046069	<b>English - Beginners</b> Michaela Schusová, Ilona Šimice, Hana Volejníková, Veronika Kratochvílová <b>Ilona Šimice</b>	Z	2	0P+2C	L	v
2046126	<b>Czech Lower Intermediate</b> <b>Jaroslava Kormmová</b>	Z	2	0P+2C	L	v
2046125	<b>Czech Lower Intermediate</b> <b>Jaroslava Kormmová</b>	Z	2	0P+2C	Z	v
2046118	<b>Czech -Advanced</b> <b>Jaroslava Kormmová</b>	Z	2	0P+2C	L	v
2046117	<b>Czech -Advanced</b> <b>Jaroslava Kormmová</b>	Z	2	0P+2C	Z	v
2046127	<b>Czech - Upper Intermediate</b> <b>Jaroslava Kormmová</b>	Z	2	0P+2C	Z	v
2046128	<b>Czech - Upper Intermediate</b> <b>Jaroslava Kormmová</b>	Z	2	0P+2C	L	v
2046119	<b>Czech Language for Beginners I.</b> <b>Jaroslava Kormmová</b>	Z	2	0P+2C	Z	v
2046120	<b>Czech Language for Beginners II.</b> <b>Jaroslava Kormmová</b>	Z	2	0P+2C	L	v
2046086	<b>French - Lower Intermediate Course</b> Michaela Schusová, Dušana Jirovská <b>Michaela Schusová</b> Michaela Schusová (Gar.)	Z	2	0P+2C	Z	v
2046087	<b>French - Lower Intermediate Course</b> Michaela Schusová, Dušana Jirovská <b>Dušana Jirovská</b>	Z	2	0P+2C	L	v
2046091	<b>French - Advanced</b> Michaela Schusová, Dušana Jirovská <b>Dušana Jirovská</b>	Z	2	0P+2C	L	v
2046090	<b>French - Advanced</b> Michaela Schusová, Dušana Jirovská, Eliška Vítková <b>Eliška Vítková</b> Eliška Vítková (Gar.)	Z	2	0P+2C	Z	v
2046089	<b>French - Upper Intermediate</b> Michaela Schusová, Dušana Jirovská <b>Dušana Jirovská</b>	Z	2	0P+2C	L	v
2046088	<b>French - Upper Intermediate</b> Michaela Schusová, Dušana Jirovská, Eliška Vítková <b>Michaela Schusová</b> Michaela Schusová (Gar.)	Z	2	0P+2C	Z	v
2046084	<b>French - Beginners</b> Michaela Schusová, Dušana Jirovská <b>Michaela Schusová</b> Michaela Schusová (Gar.)	Z	2	0P+2C	Z	v
2046085	<b>French - Beginners' Course</b> Michaela Schusová, Dušana Jirovská <b>Michaela Schusová</b> Michaela Schusová (Gar.)	Z	2	0P+2C	L	v
2146060	<b>Indonesian Language Course for Exchange</b>	Z	2	0P+2C	*	v
2146061	<b>Technical Indonesian - Course I.</b>	Z	2	0P+2C	Z	v
2144062	<b>Technical Indonesian - Course II.</b>	Z,ZK	3	1P+2C	L	v
2046078	<b>German - Lower Intermediate Course</b> Michaela Schusová, Eliška Vítková, Jaroslava Kormmová, Petr Laurich <b>Michaela Schusová</b> Michaela Schusová (Gar.)	Z	2	0P+2C	Z	v
2046079	<b>German - Lower Intermediate Course</b> Michaela Schusová, Eliška Vítková, Jaroslava Kormmová, Petr Laurich <b>Eliška Vítková</b>	Z	2	0P+2C	L	v
2046083	<b>German - Advanced Course</b> Michaela Schusová, Eliška Vítková, Jaroslava Kormmová, Petr Laurich <b>Jaroslava Kormmová</b>	Z	2	0P+2C	L	v
2046082	<b>German - Advanced Course</b> Michaela Schusová, Eliška Vítková, Jaroslava Kormmová, Petr Laurich <b>Michaela Schusová</b> Michaela Schusová (Gar.)	Z	2	0P+2C	Z	v
2046081	<b>German - Upper Intermediate Course</b> Michaela Schusová, Eliška Vítková, Jaroslava Kormmová, Petr Laurich <b>Eliška Vítková</b>	Z	2	0P+2C	L	v
2046080	<b>German - Upper Intermediate Course</b> Michaela Schusová, Eliška Vítková, Jaroslava Kormmová, Petr Laurich <b>Michaela Schusová</b> Michaela Schusová (Gar.)	Z	2	0P+2C	Z	v
2046076	<b>German - Beginners</b> Michaela Schusová, Eliška Vítková, Jaroslava Kormmová, Petr Laurich <b>Michaela Schusová</b> Michaela Schusová (Gar.)	Z	2	0P+2C	Z	v
2046077	<b>German - Beginners</b> Michaela Schusová, Eliška Vítková, Jaroslava Kormmová, Petr Laurich <b>Eliška Vítková</b>	Z	2	0P+2C	L	v
2046161	<b>Presentations in English</b> Michaela Schusová, Ilona Šimice, Eliška Vítková, Nina Procházková Ayyub <b>Michaela Schusová</b> Michaela Schusová (Gar.)	Z	2	0P+2C	*	v
2046166	<b>Presentations in Czech</b> Eliška Vítková, Jaroslava Kormmová, Petr Laurich <b>Jaroslava Kormmová</b> Petr Laurich (Gar.)	Z	2	0P+2C	*	v

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

**Characteristics of the courses of this group of Study Plan: Code=12B\*\*1V-DOP ZJK Name=06 2012 doporu ené 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 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
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
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
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
2046126	Czech 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.	Z	2

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	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.			
2146060	Indonesian Language Course for Exchange	Z	2
Basic of Indonesian Language for Student Exchange Program to Indonesia			
2146061	Technical Indonesian - Course I.	Z	2
Second part of Indonesian Language for Student Exchange Program to Indonesia			
2144062	Technical Indonesian - Course II.	Z,ZK	3
Basic of Indonesian Language for Student Exchange Program to Indonesia			
2046078	German - Lower Intermediate Course	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.			
2046079	German - Lower Intermediate Course	Z	2
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.			
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.			
2046082	German - Advanced Course	Z	2
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.			
2046081	German - Upper Intermediate Course	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.			
2046080	German - Upper Intermediate Course	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.			

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 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
2046098	Spanish - Lower Intermediate 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
2046096	Spanish - Beginners 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
2046097	Spanish - Beginners 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.	Z	2

### 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
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: eigenvalues and eigenvectors of a matrix, Taylor polynomial, integral as a limit function, integration of some special functions.	Z,ZK	8

2011062	<b>Matematika II.</b> 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
2012037	<b>Computer Graphics</b>	KZ	3
2016007	<b>Mathematics I. - Seminar</b>	Z	2
201A021	<b>Constructive Geometry A</b> The subject is focused on geometric objects in the space - curves, surfaces and solids and their properties and mutual relations.	ZK	3
201A056	<b>Mathematics I.A</b> Introduction to linear algebra, analytic geometry of straight lines and planes in $E^3$ , calculus of functions of one variable	ZK	4
201A062	<b>Mathematics II.A</b> 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	<b>Physics II.</b> 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	<b>Physics I.</b> 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	<b>Physics - Seminar</b> The subject is mainly meant for high-school students for repetition of high-school physics.	Z	2
202A041	<b>Physics I.</b> 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	<b>English-Bachelor Exam</b> 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	<b>German - Bachelor Exam / FME</b> 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	<b>French - Bachelor Exam /FME</b> 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	<b>Spanish - Bachelor Exam / FME</b> 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	<b>Russian - Bachelor Exam / FME</b> 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	<b>English - Beginners</b> 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	<b>English - Beginners</b> 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	<b>English - Lower Intermediate</b> 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	<b>English - Lower Intermediate</b> 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	<b>English - Upper Intermediate</b> 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	<b>English - Upper Intermediate</b> 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	<b>English - Advanced</b> 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	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.			
2046076	German - 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)			
2046077	German - Beginners	Z	2
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).			
2046078	German - Lower Intermediate Course	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.			
2046079	German - Lower Intermediate Course	Z	2
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.			
2046080	German - Upper Intermediate Course	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.			
2046081	German - Upper Intermediate Course	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.			
2046082	German - Advanced Course	Z	2
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 currant issues and popular scientific and technical articles.			
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 currant 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 currant 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 currant issues and popular scientific and technical articles.			

2046118	<b>Czech -Advanced</b> 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.	Z	2
2046119	<b>Czech Language for Beginners I.</b> 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
2046120	<b>Czech Language for Beginners II.</b> 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
2046125	<b>Czech Lower Intermediate</b> 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
2046126	<b>Czech Lower Intermediate</b> 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
2046127	<b>Czech - Upper Intermediate</b> 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
2046128	<b>Czech - Upper Intermediate</b> 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.	Z	2
2046135	<b>Russian - Beginners</b> 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
2046136	<b>Russian - Beginners</b> 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
2046137	<b>Russian - Lower Intermediate Course</b> 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	<b>Russian - Lower Intermediate Course</b> 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	<b>Russian - Upper Intermediate</b> 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	<b>Russian - Upper Intermediate</b> 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	<b>Russian - Advanced</b> 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	<b>Russian - Advanced</b> 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	<b>English Conversation</b> Improving communicative skills in speaking on general topics and general technical topics.	Z	2
2046156	<b>English Conversation</b> Improving communicative skills in speaking on general topics and general technical topics.	Z	2
2046161	<b>Presentations in English</b> Preparing students to present in English on technical topics, with a possible co-operation with specialized departments.	Z	2
2046162	<b>Presentations in German</b> Preparation for presenting technical topics in German, possibly in cooperation with specialized departments.	Z	2
2046163	<b>Presentations in French language</b> Preparation for presenting technical topics in French, possibly in cooperation with specialized departments.	Z	2
2046164	<b>Presentations in Russian</b> Preparation for presenting technical topics in Russian, possibly in cooperation with specialized departments.	Z	2
2046165	<b>Presentations in Spanish</b> Preparation for presenting technical topics in Spanish, possibly in cooperation with specialized departments.	Z	2
2046166	<b>Presentations in Czech</b> Preparing students to give presentations in English on technical topics, with a possible co-operation with specialized departments.	Z	2
2121023	<b>Thermodynamics</b> The course deal with a basic engineering approach to classical thermodynamics, heat transfer and compressible flow through nozzles and diffusers. Basic concepts and principles are introduced, and they are applied mostly to systems behaving as ideal gases or typical vapours. Basic notions associated with ideal mixtures are studied with an emphasis on psychometrics. Heat transfer covers fundamentals of conduction, convection and radiation. Heat exchangers are treated as an engineering application. Exercises and labs are devoted to practical problems and experimental technique.	Z,ZK	5
2131002	<b>Engineering Design II</b> 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

2131005	History of Technology	ZK	3
Development of human knowledge in the domain of science and technology in the retrospective of the development of our civilization. Emphasis is given upon new branches of technology with special attention to the contribution of mining, iron metallurgy, power engineering, transportation and of the machine industry in the narrower sense of the word.			
2131519	Machine Elements for Technology	Z,ZK	5
2132001	Engineering Design I. Basic of technical representation, dimensioning and tolerancing	KZ	2
2141204	Introduction to Electrical Engineering for Technology	Z,ZK	4
Elements of electrical circuits, analysis of electrical circuits as DC and AC. El. Power and Energy. Principle and typical parameters diodes, transistors, thyristors, operation amplifiers. Analogue and digital circuits. AC el. circuits. Electrical power and energy. Calculation, measurement, power factor. Transformer. Induction machines. Synchronous machines. DC-machines			
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
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.			
2311004	Mechanics for Technology	Z,ZK	7
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
2321067	Technical Application of Materials	Z,ZK	5
P ed m t popisuje aplikovatelnost jednotlivých skupin inženýrských materiál ů a jejich odpovídající vlastnosti. Rovn ě se v ů nuje aktuálním vývojným trend m t chto skupin. The subject describes applicability of specific engineering material types and their characteristics. It deals with the current development trends in these materials as well.			
2321501	The course characterizes individual groups of new construction materials. In addition to the development and physical nature of these materials, the most commonly used types of recently developed materials, their basic characteristics and mechanical properties are listed. Their technological possibilities, design applicability and methods of their designations are also presented.	Z,ZK	4
2321503	Technical testing of materials	Z,ZK	5
Term and definition of properties. Verification of properties in a certified quality management system. Accredited test laboratory and test systems, test standard. Basic mechanical properties and testing the characteristics of metals, polymers, composites and ceramics. Testing of material for the limited state is the basic methods in accordance with the relevant standards. Test of resistance to brittle fracture, fatigue, creep. Evaluation of technological properties. Defectoscopic method for detecting defects in the material.			
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
2322041	Heat treatment Theoretical fundamentals of heat treatment, basic processes of heat and chemical-heat treatment of ferrous and non-ferrous metals, excursion focused on the given topic	KZ	4
2322091	Project On the basis of the preliminary submission of a bachelor thesis the students, under supervision of their supervisors, prepare a review summarizing and evaluating the studied literature with particular emphasis on experimental technologies which can be applied in their bachelor theses. They can also mention a planned experiment or evaluate hitherto obtained knowledge or results.	KZ	2
2323993	Bachelor Thesis	Z	5
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
2331071	Automation of Production Processes Automation of basic technological processes - casting, welding, forming and finishing. Facilities and equipment required to automate offices. Mechanization and automation in iron and steel foundries. Automation and robotics of die casting process, including other peripherals. Designing and programming of robotic welding centers. Designing and programming of robotic workstations for sheet metal forming. Design of automated forging cells. Design of automated finishing lines.	Z,ZK	5
2331505	Welding Technology	Z,ZK	4
2332091	Project	KZ	2
2333017	Surface Treatment Introduction to the surface treatments - branch signification and objects. Principles of corrosion, types and corrosion distribution. Anticorrosive prevention in manufacturing, method anticorrosive prevention. Corrosion testing. Surface pre-treatment. Converse coatings, enamels. Inorganic coatings, electroplating, hot-dip galvanizing. Organic coatings. Ecological aspects of surface treatments.	Z	3
2333038	Fundamentals of Technology I. 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.	Z	3
2341001	Metrology Metrology, intergration into quality control, legal metrology, metrology system. Geometrical quantities metrology. Measurement uncertainty. Primary and secondary standarts. Measurement in 1, 2, end 3 coordinates. Laserinterferometres and their applications. Geometrical surface properties. Form - and position deviations. Surface structure - roughness, waviness. Measurement automatisaton.	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 planing.	Z,ZK	5



2342005	Quality Control	KZ	2
Basic quality control terms, where is quality created, who is responsible for a quality. Basic statistical terms and distributions. Statistical methods: statistical process control, statistical sampling. Tools and methods for a quality assurance during product lifetime cycle. Standards 9 000 and 14 000, certification of quality control systems.			
2342091	Project	KZ	2
Work on specialized tasks.			
2372041	Computer Support for Study	KZ	3
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.			
2381002	Fundamentals of Economics	Z,ZK	5
The course is focused on the following subjects: basic economic relations and consequences. Economic aggregates and their consequences. Operating of the economics according to so called macroeconomic circle, various economic theories. Consumption behaviour in microeconomics. Theory of production. Different markets and competitions.			
2381068	Cost Accounting	Z,ZK	5
The subject presents an introduction to the problems of value management as the enterprise on the whole and its parts - centres - by means of budgeting (expected cost), so the individual achievements (intermediate products, products, services) - by means of preliminary costing (expected costs) and actual costing (actual costs). Emphasis is laid on the relation of costs on the whole - enterprise costs - to the costs of individual achievements and the understanding of the transformation from costs in the budgeting and accounting structure (individual cost items) into the costing structure (direct and overhead costs), and fixed and variable costs. There are taught conventional and also modern approaches in costing. The subject Cost Accounting is connected directly with the subject Accounting and represents an introduction to the problems of cost allocation to separate products, which are compared with the market price and finding out as their profitability, so their acceptability or unacceptability manufacturing program.			
2381075	Enterprise Management and Economics	Z,ZK	5
2381098	Enterprise Finance	Z,ZK	4
The subject Financing of the Enterprise provides a broad-based introduction to financial management. Students have an opportunity to acquire an understanding of the main concepts and their practical application in decision-making. Students gain knowledge of financial management role within a business, financial ratios, nature and purpose of projected financial statements and their role in the development of future plans for a business and in the assessing the impact of management decision on the performance and position of a business, factors which must be taken into account when managing the working capital of a business, various aspects of financing the business through external and internal sources of finance available to a business, ways how business can make decision and evaluation involving investments in new technology, and various aspects of mergers and takeovers.			
2381174	Enterprise Information Systems	Z,ZK	4
2382048	Statistical and Decision Analysis	KZ	4
Statistical analysis is a good basis for a creation of decision-making models. The goal of this subject is to teach students to apply the selected statistical method, to apply models of decision analysis, to create models for the management of industrial enterprises.			
2382091	Specialization Project	KZ	2
2383001	Fundamentals of Law	Z	2
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			
2383008	Managerial Psychology	Z	2
2383102	Personnel Management	Z	2
Personnel / human resource management is concerned with the effective management of people at work. Subject examines what can or should be done to make people both more productive and more satisfied with their working life. Its goal is to help develop more effective managers and staff specialists who work directly with the human resources of organizations.			

For updated information see <http://bilakniha.cvut.cz/en/FF.html>

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