

Study plan

Name of study plan: 15 80 85 00 DVES OBR 2012 P

Faculty/Institute/Others:

Department:

Branch of study guaranteed by the department: Technology, Materials and Management of Engineering

Garantor of the study branch: prof. Ing. Františka Pešlová, Ph.D.

Program of study: Manufacturing and Economy in Mechanical Engineering

Type of study: Bachelor full-time

Required credits: 115

Elective courses credits: 66

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: 106

The role of the block: P

Code of the group: 12BVP4P

Name of the group: 09 2012 BVES 4.sem prezenční 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
2381075	Enterprise Management and Economics	Z,ZK	5	2P+2C	4	P
2383102	Personnel Management Jan Horejc Jan Horejc (Gar.)	Z	2	2P+1C	*	P
2341014	Technology II. Lubomír Štajnochr, Michael Valášek, Libor Beránek, Jiří Kyncl, Petr Mikeš, Pavel Novák, Zdeněk Pítrmuc, Jan Podaný, Jan Šimota, Pavel Novák	Z,ZK	5	2P+2L	*	P
2342005	Quality Control Jan Podaný Jan Podaný Jan Podaný (Gar.)	KZ	2	1P+1L	*	P

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

2381075	Enterprise Management and Economics	Z,ZK	5
2383102	Personnel Management 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.	Z	2
2341014	Technology II. mechanics of chip formation, cutting processes, finishing operations, non-traditional machining processes. Production rates calculation, machining economics. Automation of processes, programming of manufacture. Engineering metrology. Assembly techniques. Introduction to process planning.	Z,ZK	5
2342005	Quality Control 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.	KZ	2

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) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
2381068	Cost Accounting Theodor Beran, Ladislav Vaniš Theodor Beran Theodor Beran (Gar.)	Z,ZK	5	2P+2C	*	P
2383001	Fundamentals of Law František Klimeš František Klimeš František Klimeš (Gar.)	Z	2	1P+1C	*	P
2141204	Introduction to Electrical Engineering for Technology Jan Chyský, Lubomír Musálek, Jiří Štátný, Martin Novák Lubomír Musálek Jan Chyský (Gar.)	Z,ZK	4	2P+2L	*	P
2131519	Machine Elements for Technology Jaroslav Kříčka, Jan Kanaval, Zdeněk Čespiro, František Lopot, Eliška Cézová František Lopot František Lopot (Gar.)	Z,ZK	5	2P+3C	*	P

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

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.
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
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
2131519	Machine Elements for Technology	Z,ZK	5	

Code of the group: 12BV*5P-OBR

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

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

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

Credits in the group: 17

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
2342032	Automation of machine tool programming Pavel Novák, Jan Tomíček Pavel Novák	KZ	3	1P+2C	*	P
2341515	Manufacturing process planning Jiří Kyncl Pavel Novák	Z,ZK	4	2P+2C	*	P
2341001	Metrology Libor Beránek, Petr Mikeš, Jan Podaný, Rudolf Dvořák Pavel Novák	Z,ZK	5	2P+2L	*	P

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

2342032	Automation of machine tool programming	KZ	3	Utilizations of computer technique for preparation of NC programs for lathe and milling machinery. Utilizations of probes on CNC machine tool.
2341515	Manufacturing process planning	Z,ZK	4	Objective of the course in terms of learning outcomes and competences. The aim of the course is to acquaint students with modern approaches and methodology of designing machining processes with regard to minimization of material consumption and economic efficiency of the machining process. Next, introducing students to the designing of assembly processes with respect to technical and organizational conditions. Further, the aim of the subject is to explain the issue of standardization of work with regard to the type of process and the type of performed activity.
2341001	Metrology	Z,ZK	5	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 automatisation.

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	Automation of Production Processes Aleš Herman, Ladislav Kolařík, Karel Kovanda, Viktor Kreibich, Jan Kudláček, František Václav Štourač, František Tatiček, Jiří Kuchař Barbora Bryksí Stunová Aleš Herman (Gar.)	Z,ZK	5	3P+2C	*	P
2381098	Enterprise Finance František Freiberg František Freiberg (Gar.)	Z,ZK	4	2P+2C	*	P
2382048	Statistical and Decision Analysis Barbora Stieberová Barbora Stieberová 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 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
2381098	Enterprise Finance 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.	Z,ZK	4
2382048	Statistical and Decision Analysis 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.	KZ	4

Code of the group: 12BV*6P-OBR

Name of the group: 16 2012 BVES 6.sem zam OBR 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
2343993	Bachelor thesis Pavel Novák	Z	5	0P+6C	*	P
2341002	Cutting tools Lubomír Štajnochr Pavel Novák	Z,ZK	4	2P+1C	*	P
2341068	Special machining technology Vítězslav Rázek, František Holešovský, Jan Mádl Jan Mádl	Z,ZK	5	3P+2C	*	P
2381107	Engineering Ergonomy Ladislav Vaniš, Martin Kyncl František Freiberg (Gar.)	Z,ZK	4	2P+2C	*	P

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

2343993	Bachelor thesis Sources of information in the field. Databases and corporate literature. Normalization. Search activity. News from the field of engineering technology. Principles of research and work in laboratories. The principles of work safety in technological devices. Work on specialized tasks related to the focus of a thesis.	Z	5
2341002	Cutting tools Cutting tools characteristics. Cutting materials including heat treatment and surface finish, application fields. Cutting tool geometry, determination and measurement. Cutting tools elements design. Cutting tools design including dimensioning. Cutting tools production. Basic tools groups description and their use (turning tools, milling tools, etc.). Special cutting tools. Grinding, use and maintenance of cutting tools.	Z,ZK	4
2341068	Special machining technology Development of cutting material, cutting speed development and consequences on the properties of surface finish. Hard and precision machining, engineering economics and ecology. Influence of surface layer and selecting methods of machining process parameters. New methods of abrasive machining, grinding of ceramics, grinding difficult-materials. Expert, adaptive and intelligent control systems, abrasive processes. Physical methods of machining, manufacturing methods and gear threading, finishing methods. Technology in the aerospace industries, automotive, energy and other areas.	Z,ZK	5
2381107	Engineering Ergonomy The aim of the subject engineering ergonomics is to become acquainted with the problems, constraints and the optimal solution of the fundamental unit of an enterprise or organization, i.e. with system - man - technology (machine) - environment. The character of the subject is going out from the anthropocentric principle, i.e. that every system MTE as in the manufacturing, managing, technological, designing so in other spheres it is important unambiguously to accommodate them to the possibilities, abilities and skills of the weakest link - that is to the given man. The students will learn not only to start from the man's limitations during the designing of the MTE system, but also evaluate the existing economic level of the system and design rationalization measures for its optimization. The mission of the subject is that the students will be able in their work on all levels of economic spheres to ensure the optimal wellbeing for themselves and for the users of the designed systems as well as for their subordinates. The not-excludable output is also the health of man and higher quality and productivity of labour.	Z,ZK	4

Code of the group: 12DVP1P-KMEN

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

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	Chemistry Radek Šulc, Martin Dostál, Stanislav Solnař, Jan Skočilas Radek Šulc Radek Šulc (Gar.)	KZ	3	2P+1C	1	P
2011021	Constructive Geometry Ivana Linkeová	Z,ZK	6	3P+2C	*	P
2383008	Managerial Psychology	Z	2	1P+1C	*	P
2011056	Mathematics I František Mráz	Z,ZK	8	4P+4C	*	P
2372041	Computer Support for Study Vladimír Hlaváč, Goran Simeunović, Matouš Cejnek Ivo Bukovský Vladimír Hlaváč (Gar.)	KZ	3	1P+1C	*	P
2132001	Engineering Design I.	KZ	2	1P+2C	1	P
2131005	History of Technology	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 prezenční

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	Introduction to linear algebra, analytic geometry of straight lines and planes in E3, calculus of functions of one variable		
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 prezenční

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	Physics I.	Z,ZK	7	4P+1L	*	P
2011062	Matematika II. Radka Keslerová	Z,ZK	8	4P+4C	*	P
2322029	Materials Science I. Michael Valášek, Elena Čížmárová, Jakub Horník, Zdeňka Jeníková, Petr Zuna, Jana Sobotová, Ladislav Cvrček, Zdeněk Tolde, Jiří Janovec, Zdeněk Tolde Petr Zuna (Gar.)	KZ	3	2P+1L	2	P
2333017	Surface Treatment Jan Kudláček	Z	3	1P+1C	*	P
2012037	Computer Graphics Martin Hanek, Marta Hlavová, Jiří Holman, Jan Karel, Ivana Linkeová, Nikola Pajerová Ivana Linkeová	KZ	3	1P+1C	*	P
2131002	Engineering Design II	Z,ZK	4	2P+3C	2	P
2333038	Fundamentals of Technology I. Jan Kudláček	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 prezenční

2021041	Physics I.	Z,ZK	7
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.			
2011062	Matematika II.	Z,ZK	8
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.			
2322029	Materials Science I.	KZ	3
History and present state of materials engineering, overview of technical materials, internal structure of metals, crystal lattices and their defects, deformation, recrystallization and fracture of materials, structure and properties of materials and their testing, fundamentals of thermodynamics, phases and phase transformations, iron-carbon phase diagram.			
2333017	Surface Treatment	Z	3
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.			
2012037	Computer Graphics	KZ	3
2131002	Engineering Design II	Z,ZK	4
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.			
2333038	Fundamentals of Technology I.	Z	3
Production processes in engineering production. Technology of engineering production. Materials in engineering. Concepts of steel and cast iron, technical metals. Production of pig iron and steel. Casting: modeling devices, molding materials, molding and castings. Foundry alloys. Overview of basic casting technology. Forming technology. Hot and cold forging. Free and drop forging. Rolling. Production of pipes. Bulk and sheet metal forming. Welding technology. The characteristics of the various types of welding. Fusion welding: Flame welding and arc welding with coated electrodes. Thermal cutting.			

Code of the group: 12DVP3P-KMEN

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

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 Jiří Holman, Jan Karel, Marta Čertíková, Jan Valášek, Hynek Řezníček, Luděk Beneš, Tomáš Bodnár, Jiří Fůrst, Jan Halama, Radka Keslerová Leopold Herrmann (Gar.)	Z,ZK	5	2P+2C	3	P
2311004	Mechanics for Technology Michael Valášek, Tomáš Vampola, Zbyněk Šika, Václav Bauma, Ivo Bukovský, Pavel Steinbauer, Jan Zavřel, Martin Nečas, Jan Pelikán, Michael Valášek Michael Valášek (Gar.)	Z,ZK	7	4P+2C	*	P
2321039	Materials Science II. Elena Čížmárová, Jakub Horník, Zdeňka Jeníková, Petr Zuna, Jana Sobotová, Ladislav Cvrček, Zdeněk Tolde, Jiří Janovec, Jiří Cejp, Zdeněk Tolde	Z,ZK	4	2P+2L	*	P
2331068	Technology I. Michael Valášek, Aleš Herman, Ladislav Kolařík, Karel Kovanda, Viktor Kreibich, Jan Kudláček, František Václav Štourač, František Tatiček, Jiří Kuchař, Jan Suchánek Jan Kudláček (Gar.)	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 prezenční

2021025	Physics II.	Z,ZK	4
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.			
2011009	Mathematics III	Z,ZK	5
An introductory course in ordinary differential equation and infinite series.			
2311004	Mechanics for Technology	Z,ZK	7
2321039	Materials Science II.	Z,ZK	4
Fundamentals of metallurgy, iron-carbon alloys and influence of other elements, phase transformations, thermal, combined chemical and thermal and thermo-mechanical processing, technical iron-carbon alloys, non-ferrous metals and their alloys, plastics, structural ceramics, composites, selection of materials.			

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 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

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 bakalářské zkoušky z jazyků 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	English-Bachelor Exam Eliška Vítková, Zuzana Kalinová, Eva Končelíková, Michaela Schusová, Eva Pavlincová, Ilona Šimice, Nina Procházková Ayyub, Hana Volejníková, Veronika Kratochvílová Nina Procházková Ayyub	Z,ZK	2	0P+2C	*	PV
2041063	French - Bachelor Exam /FME Eliška Vítková, Dušana Jirovská Eliška Vítková Eliška Vítková (Gar.)	Z,ZK	2	0P+2C	*	PV
2041062	German - Bachelor Exam / FME Eliška Vítková, Jaroslava Kommová, Petr Laurich Jaroslava Kommová	Z,ZK	2	0P+2C	*	PV
2041065	Russian - Bachelor Exam / FME Eliška Vítková, Hana Volejníková, Dušana Jirovská Eliška Vítková	Z,ZK	2	0P+2C	*	PV
2041064	Spanish - Bachelor Exam / FME Eliška Vítková, Jaime Andrés Villagómez Jaime Andrés Villagómez	Z,ZK	2	0P+2C	*	PV

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

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

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	Technical Application of Materials Elena Čížmárová, Zdeňka Jeníková, Jana Sobotová, Ladislav Cvrček, Zdeněk Tolde, Jiří Cejp, Stanislav Krum Zdeněk Tolde Stanislav Krum (Gar.)	Z,ZK	5	3P+1C	*	PV

2381002	Fundamentals of Economics <i>Theodor Beran, Patrik Budský, Olga Dobrovoltschi Theodor Beran Theodor Beran (Gar.)</i>	Z,ZK	5	2P+2C	*	PV
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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	Main groups of engineering materials and their characteristics. Mechanical, physical, chemical properties of metals, polymers, ceramics, metallic glasses, and composites. Classification and designation of materials according to EN. Material and its role in the engineering design of a technical object. Selection of material with respect to utility properties. Typical applications of materials in power engineering, transportation, chemistry, electrical engineering and biomedicine.		
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) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
2322091	Project <i>Elena Čizmárová, Jakub Horník, Zdeňka Jeníková, Petr Zuna, Jana Sobotová, Ladislav Cvrček, Zdeněk Tolde, Jiří Janovec, Jiří Cejp, Zdeněk Tolde Jiří Cejp (Gar.)</i>	KZ	2	0P+2C	*	PV
2332091	Project <i>Aleš Herman, Ladislav Kolařík, Karel Kovanda, Viktor Kreibich, Jan Kudláček, František Václav Štourač, František Tatiček, Jiří Kuchař, Bohumír Bednář, Barbora Bryksí Stunová Aleš Herman (Gar.)</i>	KZ	2	0P+2C	*	PV
2342091	Project <i>Lubomír Štajnochr, Libor Beránek, Tomáš Kellner, Jiří Kyncl, Petr Mikeš, Pavel Novák, Lukáš Pelikán, Zdeněk Pitrmuc, Jan Podaný, Pavel Novák</i>	KZ	2	0P+2C	*	PV
2382091	Specialization Project	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.		
2332091	Project	KZ	2			
2342091	Project	KZ	2	Work on specialized tasks.		
2382091	Specialization Project	KZ	2			

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) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
202A041	Physics I.	ZK	3	0P+0L	*	v
201A021	Constructive Geometry A <i>Ivana Linkeová</i>	ZK	3	0P+0C	*	v
201A056	Mathematics I.A <i>Radka Keslerová</i>	ZK	4	0P+0C	*	v
201A062	Mathematics II.A <i>Radka Keslerová</i>	ZK	4	0P+0C	*	v

Characteristics of the courses of this group of Study Plan: Code=12BVV-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 E3, calculus of functions of one variable	ZK	4
201A062	Mathematics II.A Open and closed set, boundary in E ⁿ . Real function of k-variables. Partial derivatives and differentiability. Gradient and directional derivative. Differential operators div (divergence) and curl (rotation). Function given implicitly. Local and global (= absolute) extremes of a function of more variables. Double integral, volume (=triple) integral, Fubini theorem. Transformation of integrals to polar, cylindrical and spherical coordinates. A simple smooth curve and line integral of a scalar and vector function. Circulation and Green's theorem. A potential vector field, independence of a line integral on the path. Simple smooth surface and surface integral of a scalar function and a vector function. Flow of a vector field through a surface. The Gauss-Ostrogradskij theorem.	ZK	4

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

Name of the group: 05 2012 doporučené semináře

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 Jan Valášek, Hynek Řezníček, Luděk Beneš, Tomáš Bodnár, Radka Keslerová, Olga Majlingová, František Mráz, Tomáš Neustupa, Milana Kittlerová Radka Keslerová František Mráz (Gar.)	Z	2	0P+2C	1	v

Characteristics of the courses of this group of Study Plan: Code=12B1V-DOP SEMI Name=05 2012 doporučené semináře**

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 doporučené 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 Eliška Vítková, Ilona Šimice, Nina Procházková Ayyub Nina Procházková Ayyub Nina Procházková Ayyub (Gar.)	Z	2	0P+2C	*	v
2046156	English Conversation Eliška Vítková, Ilona Šimice, Nina Procházková Ayyub Nina Procházková Ayyub	Z	2	0P+2C	L	v
2046070	English - Lower Intermediate Eliška Vítková, Zuzana Kalinová, Michaela Schusová, Ilona Šimice, Nina Procházková Ayyub, Hana Volejníková, Veronika Kratochvílová Michaela Schusová Zuzana Kalinová (Gar.)	Z	2	0P+2C	Z	v
2046071	English - Lower Intermediate Eliška Vítková, Michaela Schusová, Ilona Šimice, Nina Procházková Ayyub, Hana Volejníková, Veronika Kratochvílová Michaela Schusová	Z	2	0P+2C	L	v
2046075	English - Advanced Eliška Vítková, Michaela Schusová, Ilona Šimice, Nina Procházková Ayyub, Hana Volejníková, Veronika Kratochvílová Michaela Schusová	Z	2	0P+2C	L	v

2046074	English - Advanced Eliška Vítková, Zuzana Kalinová, Michaela Schusová, Ilona Šimice, Nina Procházková Ayyub, Hana Volejníková, Veronika Kratochvílová Michaela Schusová Zuzana Kalinová (Gar.)	Z	2	0P+2C	Z	v
2046072	English - Upper Intermediate Eliška Vítková, Zuzana Kalinová, Michaela Schusová, Ilona Šimice, Nina Procházková Ayyub, Hana Volejníková, Veronika Kratochvílová Michaela Schusová Zuzana Kalinová (Gar.)	Z	2	0P+2C	Z	v
2046073	English - Upper Intermediate Eliška Vítková, Michaela Schusová, Ilona Šimice, Nina Procházková Ayyub, Hana Volejníková, Veronika Kratochvílová Michaela Schusová	Z	2	0P+2C	L	v
2046069	English - Beginners Eliška Vítková, Michaela Schusová, Ilona Šimice, Nina Procházková Ayyub, Hana Volejníková, Veronika Kratochvílová Michaela Schusová	Z	2	0P+2C	L	v
2046068	English - Beginners Eliška Vítková, Zuzana Kalinová, Michaela Schusová, Ilona Šimice, Hana Volejníková, Veronika Kratochvílová Michaela Schusová Zuzana Kalinová (Gar.)	Z	2	0P+2C	Z	v
2046087	French - Lower Intermediate Course Eliška Vítková, Dušana Jirovská Eliška Vítková	Z	2	0P+2C	L	v
2046086	French - Lower Intermediate Course Eliška Vítková, Dušana Jirovská Eliška Vítková Eliška Vítková (Gar.)	Z	2	0P+2C	Z	v
2046091	French - Advanced Eliška Vítková, Dušana Jirovská Eliška Vítková	Z	2	0P+2C	L	v
2046090	French - Advanced Eliška Vítková, Dušana Jirovská Eliška Vítková Eliška Vítková (Gar.)	Z	2	0P+2C	Z	v
2046089	French - Upper Intermediate Eliška Vítková, Dušana Jirovská Eliška Vítková	Z	2	0P+2C	L	v
2046088	French - Upper Intermediate Eliška Vítková, Dušana Jirovská Eliška Vítková Eliška Vítková (Gar.)	Z	2	0P+2C	Z	v
2046084	French - Beginners Eliška Vítková, Dušana Jirovská Eliška Vítková Eliška Vítková (Gar.)	Z	2	0P+2C	Z	v
2046085	French - Beginners' Course Eliška Vítková, Dušana Jirovská Eliška Vítková	Z	2	0P+2C	L	v
2146060	Indonesian Language Course for Exchange	Z	2	0P+2C	*	v
2146061	Technical Indonesian - Course I.	Z	2	0P+2C	Z	v
2144062	Technical Indonesian - Course II.	Z,ZK	3	1P+2C	L	v
2046079	German - Lower Intermediate Course Eliška Vítková, Jaroslava Kommová, Petr Laurich Jaroslava Kommová	Z	2	0P+2C	L	v
2046078	German - Lower Intermediate Course Eliška Vítková, Jaroslava Kommová, Petr Laurich Jaroslava Kommová Eliška Vítková (Gar.)	Z	2	0P+2C	Z	v
2046083	German - Advanced Course Eliška Vítková, Jaroslava Kommová, Petr Laurich	Z	2	0P+2C	L	v
2046082	German - Advanced Course Eliška Vítková, Jaroslava Kommová, Petr Laurich Jaroslava Kommová Eliška Vítková (Gar.)	Z	2	0P+2C	Z	v
2046080	German - Upper Intermediate Course Eliška Vítková, Jaroslava Kommová, Petr Laurich Jaroslava Kommová Eliška Vítková (Gar.)	Z	2	0P+2C	Z	v
2046081	German - Upper Intermediate Course Eliška Vítková, Jaroslava Kommová, Petr Laurich Jaroslava Kommová	Z	2	0P+2C	L	v
2046076	German - Beginners Eliška Vítková, Jaroslava Kommová, Petr Laurich Jaroslava Kommová Petr Laurich (Gar.)	Z	2	0P+2C	Z	v
2046077	German - Beginners Eliška Vítková, Jaroslava Kommová, Petr Laurich Jaroslava Kommová	Z	2	0P+2C	L	v
2046161	Presentations in English Eliška Vítková, Zuzana Kalinová, Michaela Schusová, Ilona Šimice, Nina Procházková Ayyub Michaela Schusová Michaela Schusová (Gar.)	Z	2	0P+2C	*	v
2046162	Presentations in German Eliška Vítková, Jaroslava Kommová, Petr Laurich Jaroslava Kommová Eliška Vítková (Gar.)	Z	2	0P+2C	*	v
2046164	Presentations in Russian Eliška Vítková, Dušana Jirovská Eliška Vítková Dušana Jirovská (Gar.)	Z	2	0P+2C	*	v
2046166	Presentations in Czech Eliška Vítková, Jaroslava Kommová, Petr Laurich Jaroslava Kommová Petr Laurich (Gar.)	Z	2	0P+2C	*	v
2046163	Presentations in French language Eliška Vítková, Dušana Jirovská Eliška Vítková Dušana Jirovská (Gar.)	Z	2	0P+2C	*	v
2046165	Presentations in Spanish Eliška Vítková Eliška Vítková	Z	2	0P+2C	*	v
2046138	Russian - Lower Intermediate Course Eliška Vítková, Hana Volejníková, Dušana Jirovská	Z	2	0P+2C	L	v
2046137	Russian - Lower Intermediate Course Eliška Vítková, Hana Volejníková, Dušana Jirovská Eliška Vítková (Gar.)	Z	2	0P+2C	Z	v

2046142	Russian - Advanced <i>Eliška Vítková, Hana Volejníková, Dušana Jirovská</i>	Z	2	0P+2C	L	v
2046141	Russian - Advanced <i>Eliška Vítková, Hana Volejníková, Dušana Jirovská Dušana Jirovská (Gar.)</i>	Z	2	0P+2C	Z	v
2046139	Russian - Upper Intermediate <i>Eliška Vítková, Hana Volejníková, Dušana Jirovská Eliška Vítková (Gar.)</i>	Z	2	0P+2C	Z	v
2046140	Russian - Upper Intermediate <i>Eliška Vítková, Hana Volejníková, Dušana Jirovská</i>	Z	2	0P+2C	L	v
2046135	Russian - Beginners <i>Eliška Vítková, Hana Volejníková, Dušana Jirovská Eliška Vítková (Gar.)</i>	Z	2	0P+2C	Z	v
2046136	Russian - Beginners <i>Eliška Vítková, Hana Volejníková, Dušana Jirovská</i>	Z	2	0P+2C	L	v
2046125	Czech Lower Intermediate <i>Ilona Šimice, Jaroslava Kommová, Petr Laurich Jaroslava Kommová Petr Laurich (Gar.)</i>	Z	2	0P+2C	Z	v
2046126	Czech Lower Intermediate <i>Jaroslava Kommová</i>	Z	2	0P+2C	L	v
2046118	Czech -Advanced <i>Jaroslava Kommová</i>	Z	2	0P+2C	L	v
2046117	Czech -Advanced <i>Ilona Šimice, Jaroslava Kommová, Petr Laurich Jaroslava Kommová Jaroslava Kommová (Gar.)</i>	Z	2	0P+2C	Z	v
2046128	Czech - Upper Intermediate <i>Jaroslava Kommová</i>	Z	2	0P+2C	L	v
2046127	Czech - Upper Intermediate <i>Ilona Šimice, Jaroslava Kommová, Petr Laurich Jaroslava Kommová Jaroslava Kommová (Gar.)</i>	Z	2	0P+2C	Z	v
2046119	Czech Language for Beginners I. <i>Ilona Šimice, Jaroslava Kommová, Petr Laurich Jaroslava Kommová Jaroslava Kommová (Gar.)</i>	Z	2	0P+2C	Z	v
2046120	Czech Language for Beginners II. <i>Jaroslava Kommová</i>	Z	2	0P+2C	L	v
2046098	Spanish - Lower Intermediate <i>Eliška Vítková, Jaime Andrés Villagómez Eliška Vítková (Gar.)</i>	Z	2	0P+2C	Z	v
2046099	Spanish - Lower Intermediate <i>Eliška Vítková, Jaime Andrés Villagómez</i>	Z	2	0P+2C	L	v
2046096	Spanish - Beginners <i>Eliška Vítková, Jaime Andrés Villagómez Eliška Vítková (Gar.)</i>	Z	2	0P+2C	Z	v
2046097	Spanish - Beginners <i>Eliška Vítková, Jaime Andrés Villagómez</i>	Z	2	0P+2C	L	v

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

2046155	English Conversation Improving communicative skills in speaking on general topics and general technical topics.	Z	2
2046156	English Conversation Improving communicative skills in speaking on general topics and general technical topics.	Z	2
2046070	English - Lower Intermediate Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language. A1 - A2.	Z	2
2046071	English - Lower Intermediate Mapped to the Common European Framework of Reference Level A2 Aim: Understanding clearly spoken language about everyday situations which a student meets either at school or at his/her free time and speaking about them. Writing in a simple way about familiar topics. reading and comprehension of simple texts. Improvement of professional language.	Z	2
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
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
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
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
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

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.			
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.			
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			
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.			
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.			
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.			
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.			
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).			
2046161	Presentations in English	Z	2
Preparing students to present in English on technical topics, with a possible co-operation with specialized departments.			
2046162	Presentations in German	Z	2
Preparation for presenting technical topics in German, possibly in cooperation with specialized departments.			
2046164	Presentations in Russian	Z	2
Preparation for presenting technical topics in Russian, possibly in cooperation with specialized departments.			
2046166	Presentations in Czech	Z	2
Preparing students to give presentations in English on technical topics, with a possible co-operation with specialized departments.			
2046163	Presentations in French language	Z	2
Preparation for presenting technical topics in French, possibly in cooperation with specialized departments.			
2046165	Presentations in Spanish	Z	2
Preparation for presenting technical topics in Spanish, possibly in cooperation with specialized departments.			
2046138	Russian - Lower Intermediate Course	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.			

2046137	Russian - 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.			
2046142	Russian - Advanced	Z	2
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.			
2046141	Russian - Advanced	Z	2
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.			
2046139	Russian - 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.			
2046140	Russian - Upper Intermediate	Z	2
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.			
2046135	Russian - Beginners	Z	2
Basic vocabulary of everyday life in a spoken and written form. Understanding and use of basic expressions of general scientific terminology (professional language)			
2046136	Russian - Beginners	Z	2
Mapped to the level of Common European Framework of Reference: A1 Basic vocabulary of everyday life in a spoken and written form. Understanding and use of basic expressions of general scientific terminology (professional language)			
2046125	Czech Lower Intermediate	Z	2
Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2046126	Czech Lower Intermediate	Z	2
Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
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.			
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.			
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.			
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).			
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.			
2046096	Spanish - Beginners	Z	2
Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2046097	Spanish - Beginners	Z	2
Mapped to the Common European Framework of Reference Level A1. Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			

List of courses of this pass:

Code	Name of the course	Completion	Credits
2011009	Mathematics III An introductory course in ordinary differential equation and infinite series.	Z,ZK	5
2011021	Constructive Geometry The subject is focused on geometric objects in the space - curves, surfaces and solids and their properties and mutual relations.	Z,ZK	6

2011056	Mathematics I Introduction to linear algebra, analytic geometry of straight lines and planes in E3, calculus of functions of one variable	Z,ZK	8
2011062	Matematika II. Open and closed set, boundary in E^k . Real function of k-variables. Partial derivatives and differentiability. Gradient and directional derivative. Differential operators div (divergence) and curl (rotation). Function given implicitly. Local and global (= absolute) extremes of a function of more variables. Double integral, volume (=triple) integral, Fubini theorem. Transformation of integrals to polar, cylindrical and spherical coordinates. A simple smooth curve and line integral of a scalar and vector function. Circulation and Green's theorem. A potential vector field, independence of a line integral on the path. Simple smooth surface and surface integral of a scalar function and a vector function. Flow of a vector field through a surface. The Gauss-Ostrogradskij theorem.	Z,ZK	8
2012037	Computer Graphics	KZ	3
2016007	Mathematics I. - Seminar	Z	2
201A021	Constructive Geometry A The subject is focused on geometric objects in the space - curves, surfaces and solids and their properties and mutual relations.	ZK	3
201A056	Mathematics I.A Introduction to linear algebra, analytic geometry of straight lines and planes in E3, calculus of functions of one variable	ZK	4
201A062	Mathematics II.A Open and closed set, boundary in E^k . Real function of k-variables. Partial derivatives and differentiability. Gradient and directional derivative. Differential operators div (divergence) and curl (rotation). Function given implicitly. Local and global (= absolute) extremes of a function of more variables. Double integral, volume (=triple) integral, Fubini theorem. Transformation of integrals to polar, cylindrical and spherical coordinates. A simple smooth curve and line integral of a scalar and vector function. Circulation and Green's theorem. A potential vector field, independence of a line integral on the path. Simple smooth surface and surface integral of a scalar function and a vector function. Flow of a vector field through a surface. The Gauss-Ostrogradskij theorem.	ZK	4
2021025	Physics II. Faraday's law of electromagnetic induction. Maxwell's equations, electromagnetic waves. Light, wave optics, geometrical optics. Quantum properties of electromagnetic waves. Interaction of radiation with matter. Photoelectric effect. Wave-particle nature of matter. Quantum-mechanical description of particle's motion. Hydrogen atom and periodic system of elements. Spectra, x-rays, laser. Band theory of solids, semiconductors. Nucleus, radioactivity, sources of nuclear energy. Laboratories - measurements of 6 experiments related to the lectures.	Z,ZK	4
2021041	Physics I. Kinematics and dynamics of a particle motion. Principle of conservation of energy. System of particles, centre of mass. Rigid body. Continuum, elastic properties of bodies. Oscillations, waves. Fluid mechanics. Temperature and heat transfer. Kinetic theory of gases. Thermodynamics. Electric field, current, conductivity, resistance. Conductors, semiconductors, insulators. Magnetic field. Magnetic materials. Laboratories - accuracy of measurements, systematic and random errors, uncertainty of direct and indirect measurements, regression, measurements of 11 various experiments related to the lectures.	Z,ZK	7
2026016	Physics - Seminar The subject is mainly meant for high-school students for repetition of high-school physics.	Z	2
202A041	Physics I. Kinematics and dynamics of a particle motion. Principle of conservation of energy. System of particles, centre of mass. Rigid body. Continuum, elastic properties of bodies. Oscillations, waves. Fluid mechanics. Temperature and heat transfer. Kinetic theory of gases. Thermodynamics. Electric field, current, conductivity, resistance. Conductors, semiconductors, insulators. Magnetic field. Magnetic materials. Laboratories - accuracy of measurements, systematic and random errors, uncertainty of direct and indirect measurements, regression, measurements of 11 various experiments related to the lectures.	ZK	3
2041061	English-Bachelor Exam Mapped to the Common European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulties, to take part in discussions, to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.	Z,ZK	2
2041062	German - Bachelor Exam / FME Mapped to the Common European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulties, to take part in discussions, to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.	Z,ZK	2
2041063	French - Bachelor Exam /FME Mapped to the Common European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulties, to take part in discussions, to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.	Z,ZK	2
2041064	Spanish - Bachelor Exam / FME Mapped to the Common European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulties, to take part in discussions, to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.	Z,ZK	2
2041065	Russian - Bachelor Exam / FME Mapped to the Common European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulties, to take part in discussions, to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.	Z,ZK	2
2046068	English - Beginners Aim: Basic vocabulary of everyday life in a written and spoken form. Understanding and use of basic expressions of general scientific terminology (professional language). A1	Z	2
2046069	English - Beginners Mapped to the Common European Framework of Reference Level A1 Aim: Basic vocabulary of everyday life in a written and spoken form. Understanding and use of basic expressions of general scientific terminology (professional language).	Z	2
2046070	English - Lower Intermediate Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language. A1 - A2.	Z	2
2046071	English - Lower Intermediate Mapped to the Common European Framework of Reference Level A2 Aim: Understanding clearly spoken language about everyday situations which a student meets either at school or at his/her free time and speaking about them. Writing in a simple way about familiar topics. reading and comprehension of simple texts. Improvement of professional language.	Z	2
2046072	English - Upper Intermediate The aim is to extend language skills taking into consideration professional English and common professional terminology. Comprehension of standard English speech and conversation about topics of everyday life - at school, at work, during free time, on intermediate level. Broadening grammar knowledge. A2 - B1.	Z	2
2046073	English - Upper Intermediate Mapped to the Common European Framework of Reference Level B1. The aim is to extend language skills taking into consideration professional English and common professional terminology. Comprehension of standard English speech and conversation about topics of everyday life - at school, at work, during free time, on intermediate level. Broadening grammar knowledge.	Z	2

2046074	English - Advanced	Z	2
The aim: comprehension of spoken English as well as lectures given in English without great difficulties and active participation in a discussion. Written and oral skills on advanced level. Ability to write a summary, a report, an essay. reading and comprehension of popular-scientific and scientific articles or texts from student's field of studies without difficulties. Grammar structures on advanced level. B1 - B2.			
2046075	English - Advanced	Z	2
Mapped to the Common European Framework of Reference Level B1 - B2. The aim: comprehension of spoken English as well as lectures given in English without great difficulties and active participation in a discussion. Written and oral skills on advanced level. Ability to write a summary, a report, an essay. reading and comprehension of popular-scientific and scientific articles or texts from student's field of studies without difficulties. Grammar structures on advanced level.			
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 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.	Z	2
2046118	Czech -Advanced 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	Czech Language for Beginners I. 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	Czech Language for Beginners II. 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	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
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
2046127	Czech - 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
2046128	Czech - Upper Intermediate 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	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
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
2046137	Russian - Lower Intermediate Course Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.	Z	2
2046138	Russian - Lower Intermediate Course Mapped to the level of Common European Framework of Reference: A2 Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.	Z	2
2046139	Russian - Upper Intermediate Understanding standard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ability to describe experiences and events, briefly explain one's opinions and plans. Reading and understanding general and technical texts.	Z	2
2046140	Russian - Upper Intermediate Mapped to the level of Common European Framework of Reference: A2 - B1 Understanding standard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ability to describe experiences and events, briefly explain one's opinions and plans. Reading and understanding general and technical texts.	Z	2
2046141	Russian - Advanced Comprehension of spoken language as well as lectures in Russian on topics familiar to the student. Communication with native speakers, participation in discussions. Expressing opinions. Written skills. Ability to write an essay or a report. Reading and understanding texts concerning current issues and popular scientific and technical articles.	Z	2
2046142	Russian - Advanced Mapped to the level of Common European Framework of reference: B1 - B2 Comprehension of spoken language as well as lectures in Russian on topics familiar to the student. Communication with native speakers, participation in discussions. Expressing opinions. Written skills. Ability to write an essay or a report. Reading and understanding texts concerning current issues and popular scientific and technical articles.	Z	2
2046155	English Conversation Improving communicative skills in speaking on general topics and general technical topics.	Z	2
2046156	English Conversation Improving communicative skills in speaking on general topics and general technical topics.	Z	2
2046161	Presentations in English Preparing students to present in English on technical topics, with a possible co-operation with specialized departments.	Z	2
2046162	Presentations in German Preparation for presenting technical topics in German, possibly in cooperation with specialized departments.	Z	2
2046163	Presentations in French language Preparation for presenting technical topics in French, possibly in cooperation with specialized departments.	Z	2
2046164	Presentations in Russian Preparation for presenting technical topics in Russian, possibly in cooperation with specialized departments.	Z	2
2046165	Presentations in Spanish Preparation for presenting technical topics in Spanish, possibly in cooperation with specialized departments.	Z	2
2046166	Presentations in Czech Preparing students to give presentations in English on technical topics, with a possible co-operation with specialized departments.	Z	2
2121023	Thermodynamics 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	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
2131005	History of Technology 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.	ZK	3
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 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	Z,ZK	4
2144062	Technical Indonesian - Course II. Basic of Indonesian Language for Student Exchange Program to Indonesia	Z,ZK	3
2146060	Indonesian Language Course for Exchange Basic of Indonesian Language for Student Exchange Program to Indonesia	Z	2
2146061	Technical Indonesian - Course I. Second part of Indonesian Language for Student Exchange Program to Indonesia	Z	2
2182019	Chemistry General chemistry from the point of view of mechanical and process engineering. Physical chemistry forms 2/3 of the course (structure and properties of matter, thermodynamics, phase equilibrium, chemical reactions, reaction engineering), the remaining 1/3 is devoted to organic chemistry (hydrocarbons, polymers) and biochemistry. Laboratory practice is oriented upon the material properties measurement.	KZ	3
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 Main groups of engineering materials and their characteristics. Mechanical, physical, chemical properties of metals, polymers, ceramics, metallic glasses, and composites. Classification and designation of materials according to EN. Material and its role in the engineering design of a technical object. Selection of material with respect to utility properties. Typical applications of materials in power engineering, transportation, chemistry, electrical engineering and biomedicine.	Z,ZK	5
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
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
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
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, wawiness. Measurement automatISATION.	Z,ZK	5
2341002	Cutting tools Cutting tools characteristics. Cutting materials including heat treatment and surface finish, application fields. Cutting tool geometry, determination and measurement. Cutting tools elements design. Cutting tools design including dimensioning. Cutting tools production. Basic tools groups description and their use (turning tools, milling tools, etc.). Special cutting tools. Grinding, use and maintenance of cutting tools.	Z,ZK	4
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
2341068	Special machining technology Development of cutting material, cutting speed development and consequences on the properties of surface finish. Hard and precision machining, engineering economics and ecology. Influence of surface layer and selecting methods of machining process parameters. New methods of abrasive machining, grinding of ceramics, grinding difficult-materials. Expert, adaptive and intelligent control systems, abrasive processes. Physical methods of machining, manufacturing methods and gear threading, finishing methods. Technology in the aerospace industries, automotive, energy and other areas.	Z,ZK	5

2341515	Manufacturing process planning	Z,ZK	4
Objective of the course in terms of learning outcomes and competences. The aim of the course is to acquaint students with modern approaches and methodology of designing machining processes with regard to minimization of material consumption and economic efficiency of the machining process. Next, introducing students to the designing of assembly processes with respect to technical and organizational conditions. Further, the aim of the subject is to explain the issue of standardization of work with regard to the type of process and the type of performed activity.			
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.			
2342032	Automation of machine tool programming	KZ	3
Utilizations of computer technique for preparation of NC programs for lathe and milling machinery. Utilizations of probes on CNC machine tool.			
2342091	Project	KZ	2
Work on specialized tasks.			
2343993	Bachelor thesis	Z	5
Sources of information in the field. Databases and corporate literature. Normalization. Search activity. News from the field of engineering technology. Principles of research and work in laboratories. The principles of work safety in technological devices. Work on specialized tasks related to the focus of a thesis.			
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.			
2381107	Engineering Ergonomy	Z,ZK	4
The aim of the subject engineering ergonomics is to become acquainted with the problems, constraints and the optimal solution of the fundamental unit of an enterprise or organization, i.e. with system - man - technology (machine) - environment. The character of the subject is going out from the anthropocentric principle, i. e. that every system MTE as in the manufacturing, managing, technological, designing so in other spheres it is important unambiguously to accommodate them to the possibilities, abilities and skills of the weakest link - that is to the given man. The students will learn not only to start from the man's limitations during the designing of the MTE system, but also evaluate the existing economic level of the system and design rationalization measures for its optimization. The mission of the subject is that the students will be able in their work on all levels of economic spheres to ensure the optimal wellbeing for themselves and for the users of the designed systems as well as for their subordinates. The not-excludable output is also the health of man and higher quality and productivity of labour.			
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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