

# Study plan

**Name of study plan: 16 80 85 00 DVES TVA 2012 P**

Faculty/Institute/Others:

Department:

Branch of study guaranteed by the department: Welcome page

Garantor of the study branch:

Program of study: Welcome page

Type of study: unknown full-time

Required credits: 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 prezen ní povinné

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

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

Credits in the group: 22

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, <b>authors</b> and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
2342005	<b>Quality Control</b>	KZ	2	1P+1C+1L	*	P
2341014	<b>Technology II.</b>	Z,ZK	5	2P+0C+2L	*	P

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

2342005	Quality Control	KZ	2
Basic quality control terms, where is quality created, who is responsible for a quality. Basic statistical terms and distributions. Statistical methods: statistical process control, statistical sampling. Tools and methods for a quality assurance during product lifetime cycle. Standards 9 000 and 14 000, certification of quality control systems.			
2341014	Technology II.	Z,ZK	5
mechanics of chip formation, cutting processes, finishing operations, non-traditional machining processes. Production rates calculation, machining economics. Automation of processes, programming of manufacture. Engineering metrology. Assembly techniques. Introduction to process planning.			

Code of the group: 12BV\*5P

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

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

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

Credits in the group: 11

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, <b>authors</b> and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
2141204	<b>Introduction to Electrical Engineering for Technology</b> Jan Chyský, Lubomír Musálek, Martin Novák <b>Lubomír Musálek</b> Jan Chyský (Gar.)	Z,ZK	4	2P+0C+2L	*	P
2383001	<b>Fundamentals of Law</b> Václav Pilík Václav Pilík (Gar.)	Z	2	1P+1C	*	P

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

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			

2383001	Fundamentals of Law	Z	2
Basic orientation in legal system is a necessary part of professional equipment of each expert with university degree. The aim of this course is to provide a view into the Czech Legal Order, particular sources of law and system of law (branch of law), using tutorials, lectures, specialised literature and significant legal regulations. It is necessary for students to know our legal institutions, that will be regularly in touch with, especially during their professional career and to learn how to work with the collection of laws. At the same time the course leads students to know some practical habits and processes while putting the law on, especially in domain of contracts and other important legal relationships and to make them ready to prepare professional presentations and to understand basic structures between law and engineering			

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

Name of the group: 14 2012 BVES 5.sem zam TVA 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) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
2332038	Surface Treatment Technology	KZ	4	1P+2C	*	P
2331505	Welding Technology	Z,ZK	4	2P+1C	*	P
2322041	Heat treatment <i>Jana Sobotová, Martin Kuřík Jana Sobotová Jana Sobotová (Gar.)</i>	KZ	4	2P+1C	*	P

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

2332038	Surface Treatment Technology	KZ	4
TPU The course is an introduction to the topic of finishes (meaning and objectives of the field). They are introduced to the basics of corrosion distribution and its species. TPU focuses on corrosion protection in engineering and other industries. Are reconstructed surface preparation processes (mechanical, chemical). Among the discussed technologies finishes include coating technologies (such as electroplating, zinc plating) technology conversion layers, further application of organic coatings. An important issue is also ecological aspects, Technological design and testing in the field of surface treatment.			
2331505	Welding Technology	Z,ZK	4
2322041	Heat treatment	KZ	4
Theoretical fundamentals of heat treatment, basic processes of heat and chemical-heat treatment of ferrous and non-ferrous metals, excursion focused on the given topic			

Code of the group: 12BV\*6P

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

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

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

Credits in the group: 9

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
2331071	Automation of Production Processes	Z,ZK	5	3P+2C	*	P

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

2331071	Automation of Production Processes	Z,ZK	5
Automation of basic technological processes - casting, welding, forming and finishing. Facilities and equipment required to automate offices. Mechanization and automation in iron and steel foundries. Automation and robotics of die casting process, including other peripherals. Designing and programming of robotic welding centers. Designing and programming of robotic workstations for sheet metal forming. Design of automated forging cells. Design of automated finishing lines.			

Code of the group: 12BVP6P-TVA

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

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

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

Credits in the group: 22

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
2333993	Bachelor Thesis	Z	5	0P+6C	*	P
2332056	Preparations and Tools	KZ	3	0P+3C	*	P
2331065	Design Consideration	Z,ZK	5	3P+1C	*	P

2331506	Casting and Forming Technology	Z,ZK	5	3P+2C	*	P
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**Characteristics of the courses of this group of Study Plan: Code=12BVP6P-TVA Name=16 2012 BVES 6.sem zam TVA prez povinné**

2333993	Bachelor Thesis	Z	5
2332056	Preparations and Tools Principles of selection of the manufacturing method for semi-finished products. Production planning and production processes in the foundry. Production processes for forgings. Accuracy, stock material, utilized equipment. Production processes for stampings. Manufacturing of stampings, presses and equipment. Production processes for weldments. Operational sequence, filler materials, equipment. Plastic mouldings. Individual projects for production of a casting, forging or a stamping.	KZ	3
2331065	Design Consideration Relations between design, production technique and economic aspects. Design considerations in casting, forming, welding, machining and assembly techniques. Basis for material and production technology selection. Component detailing for manufacture. CNC basis and using CNC.	Z,ZK	5
2331506	Casting and Forming Technology Principles of selection of the manufacturing method for semi-finished products. Production planning and production processes in the foundry. Production processes for forgings, extrusion. Accuracy, stock material, utilized equipment. Production processes for stampings. Manufacturing of stampings, presses and equipment. Plastic mouldings. Individual projects for production of a casting, forging or a stamping.	Z,ZK	5

Code of the group: 12DVP1P-KMEN

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

Requirement credits in the group:

Requirement courses in the group:

Credits in the group: 0

Note on the group: 12B\*\*1P-KMEN #

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

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

2182019	Chemistry 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
2011021	Constructive Geometry The subject is focused on geometric objects in the space - curves, surfaces and solids and their properties and mutual relations.	Z,ZK	6
2011056	Mathematics I In the course, greater emphasis is placed on the theoretical basis of the concepts discussed and on the derivation of basic relationships and connections between concepts. Students will also get to know the procedures for solving problems with parametric input. In addition, students will gain extended knowledge in some thematic areas: eigennumbers and eigenvectors of a matrix, Taylor polynomial, integral as a limit function, integration of some special functions.	Z,ZK	8
2372041	Computer Support for Study The course introduces students into creating technical and professional documents on computers or Web and into realizing technical computations with the use of computers. Students gain practical skills by creating an essay in a text editor, by realizing technical computations with a spreadsheet calculator, and by creating technical-based WWW page.	KZ	3

Code of the group: 12DVP2P-KMEN

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

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

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

Credits in the group: 25

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

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
2021041	<b>Physics I.</b>	Z,ZK	7	4P+1L	*	P
2011062	<b>Matematika II.</b> Radka Keslerová	Z,ZK	8	4P+4C	*	P

2322029	<b>Materials Science I.</b> <i>Jana Sobotová, Eliška Galíková, Jiří Cejp, Pavlína Hájková, Jan Král, Vladimír Mára, Lucie Pílsková, Taťana Vacková</i> <b>Jana Sobotová</b> Jana Sobotová (Gar.)	KZ	3	2P+1L	2	P
2012037	<b>Computer Graphics</b> <i>Marta Hlavová, Jiří Holman, Nikola Pajerová, Martin Hanek, Jan Karel, Ivana Linkeová, Jaroslav Cibulka</i> <b>Ivana Linkeová</b> Ivana Linkeová (Gar.)	KZ	3	1P+1C	*	P
2333017	<b>Surface Treatment</b>	Z	3	1P+1C	*	P
2131002	<b>Engineering Design II</b> <i>Eliška Cézová, Jan Flek, Jan Kanaval, Karel Petr, Martin Dub, Martin Havlíček, Jan Hoidekr, František Lopot, Roman Uhlíř</i> <b>Karel Petr</b> Karel Petr (Gar.)	Z,ZK	4	2P+3C	2	P
2333038	<b>Fundamentals of Technology I.</b>	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	<b>Physics I.</b> Kinematics and dynamics of a particle motion. Principle of conservation of energy. System of particles, centre of mass. Rigid body. Continuum, elastic properties of bodies. Oscillations, waves. Fluid mechanics. Temperature and heat transfer. Kinetic theory of gases. Thermodynamics. Electric field, current, conductivity, resistance. Conductors, semiconductors, insulators. Magnetic field. Magnetic materials. Laboratories - accuracy of measurements, systematic and random errors, uncertainty of direct and indirect measurements, regression, measurements of 11 various experiments related to the lectures.	Z,ZK	7
2011062	<b>Matematika II.</b> Open and closed set, boundary in $E^k$ . Real function of $k$ -variables. Partial derivatives and differentiability. Gradient and directional derivative. Differential operators div (divergence) and curl (rotation). Function given implicitly. Local and global (= absolute) extremes of a function of more variables. Double integral, volume (=triple) integral, Fubini theorem. Transformation of integrals to polar, cylindrical and spherical coordinates. A simple smooth curve and line integral of a scalar and vector function. Circulation and Green's theorem. A potential vector field, independence of a line integral on the path. Simple smooth surface and surface integral of a scalar function and a vector function. Flow of a vector field through a surface. The Gauss-Ostrogradskij theorem.	Z,ZK	8
2322029	<b>Materials Science I.</b> History and present state of materials engineering, overview of technical materials, internal structure of metals, crystal lattices and their defects, deformation, recrystallization and fracture of materials, structure and properties of materials and their testing, fundamentals of thermodynamics, phases and phase transformations, iron-carbon phase diagram.	KZ	3
2012037	<b>Computer Graphics</b>	KZ	3
2333017	<b>Surface Treatment</b> Introduction to the surface treatments - branch signification and objects. Principles of corrosion, types and corrosion distribution. Anticorrosive prevention in manufacturing, method anticorrosive prevention. Corrosion testing. Surface pre-treatment. Converse coatings, enamels. Inorganic coatings, electroplating, hot-dip galvanizing. Organic coatings. Ecological aspects of surface treatments.	Z	3
2131002	<b>Engineering Design II</b> Principles of ISO GPS (Geometrical Products Specification). Students will get critical knowledge about ISO system of limits and fits, tolerancing, surface texture, geometrical tolerance, dimensional loops, tolerancing of angles and cones, tolerancing of threads. Integral part of course is a project where students apply and practice their knowledge from lectures.	Z,ZK	4
2333038	<b>Fundamentals of Technology I.</b> Production processes in engineering production. Technology of engineering production. Materials in engineering. Concepts of steel and cast iron, technical metals. Production of pig iron and steel. Casting: modeling devices, molding materials, molding and castings. Foundry alloys. Overview of basic casting technology. Forming technology. Hot and cold forging. Free and drop forging. Rolling. Production of pipes. Bulk and sheet metal forming. Welding technology. The characteristics of the various types of welding. Fusion welding: Flame welding and arc welding with coated electrodes. Thermal cutting.	Z	3

Code of the group: 12DVP3P-KMEN

Name of the group: 00 2012 D kmenové 3. semestr redukované pro VES 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) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
2021025	<b>Physics II.</b>	Z,ZK	4	1P+2L	3	P
2011009	<b>Mathematics III</b> <i>Radka Keslerová, Jiří Holman, Gejza Dohnal, Marta Bertíková, Vladimír Hric, Jan Valášek, Luděk Beneš, Tomáš Bodnár, Tomáš Neustupa, ..... Stanislav Kraus</i> Stanislav Kraus (Gar.)	Z,ZK	5	2P+2C	*	P
2321039	<b>Materials Science II.</b> <i>Jana Sobotová, Eliška Galíková, Jiří Cejp, Pavlína Hájková, Jan Král, Vladimír Mára, Lucie Pílsková, Taťana Vacková, Jan Walter, ..... Jana Sobotová</i> Jana Sobotová (Gar.)	Z,ZK	4	2P+2L	*	P
2331068	<b>Technology I.</b>	Z,ZK	5	2P+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	<b>Physics II.</b> Faraday's law of electromagnetic induction. Maxwell's equations, electromagnetic waves. Light, wave optics, geometrical optics. Quantum properties of electromagnetic waves. Interaction of radiation with matter. Photoelectric effect. Wave-particle nature of matter. Quantum-mechanical description of particle's motion. Hydrogen atom and periodic system of elements. Spectra, x-rays, laser. Band theory of solids, semiconductors. Nucleus, radioactivity, sources of nuclear energy. Laboratories - measurements of 6 experiments related to the lectures.	Z,ZK	4
2011009	<b>Mathematics III</b> An introductory course in ordinary differential equation and infinite series.	Z,ZK	5

2321039	Materials Science II. Fundamentals of metallurgy, iron-carbon alloys and influence of other elements, phase transformations, thermal, combined chemical and thermal and thermo-mechanical processing, technical iron-carbon alloys, non-ferrous metals and their alloys, plastics, structural ceramics, composites, selection of materials.	Z,ZK	4
2331068	Technology I. Foundry properties of metals. Treatment. Pouring. Casting solidification. Moulding and core making. Thermal treatment. Plastic deformation. Division of forming processes. Semi-products, heating-up. Cutting. Cold and hot forming. Welds. Weldability. Weldment testing. Thermal cutting. Brazing. Surface treatments.	Z,ZK	5

Name of the block: Compulsory elective courses

Minimal number of credits of the block: 9

The role of the block: PV

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

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

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

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

Credits in the group: 2

Note on the group:

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

Characteristics of the courses of this group of Study Plan: Code=12BV\*4Q-BZJ VES Name=11 2012 bakalá ské zkoušky z jazyk 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) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
2321067	<b>Technical Application of Materials</b> <i>Stanislav Krum</i>	Z,ZK	5	3P+1C	*	PV

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

2321067	Technical Application of Materials	Z,ZK	5
P edm t popisuje aplikovatelnost jednotlivých skupin inženýrských materiál ů a jejich odpovídající vlastnosti. Rovn ě ť se v nuje aktuálním vývojovým trend m t chto skupin. The subject describes applicability of specific engineering material types and their characteristics. It deals with the current development trends in these materials as well.			

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	<b>Project</b> <i>Jana Sobotová, Ji í Cejp, Pavlína Hájková, Jan Kr il, Vladimír Mára, Tā ana Vacková, Jakub Horník, Ladislav Cvr ek, Elena ižmárová, ..... Jana Sobotová Jana Sobotová (Gar.)</i>	KZ	2	0P+2C	*	PV
2332091	<b>Project</b>	KZ	2	0P+2C	*	PV
2342091	<b>Project</b>	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.			

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	<b>Physics I.</b>	ZK	3	0P+0L	*	v
201A021	<b>Constructive Geometry A</b> <i>Ivana Linkeová</i>	ZK	3	0P+0C	*	v
201A056	<b>Mathematics I.A</b> <i>Radka Keslerová</i>	ZK	4	0P+0C	*	v
201A062	<b>Mathematics II.A</b> <i>Radka Keslerová</i>	ZK	4	0P+0C	*	v

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

202A041	Physics I.	ZK	3
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.			
201A021	Constructive Geometry A	ZK	3
The subject is focused on geometric objects in the space - curves, surfaces and solids and their properties and mutual relations.			
201A056	Mathematics I.A	ZK	4
Introduction to linear algebra, analytic geometry of straight lines and planes in E3, calculus of functions of one variable			

201A062	Mathematics II.A	ZK	4
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.			

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

Name of the group: 05 2012 doporu ené seminá e

Requirement credits in the group:

Requirement courses in the group:

Credits in the group: 0

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

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

Characteristics of the courses of this group of Study Plan: Code=12B\*\*1V-DOP SEMI Name=05 2012 doporu ené seminá e

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

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

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

Requirement credits in the group:

Requirement courses in the group:

Credits in the group: 0

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
2046155	<b>English Conversation</b> <i>Ilona Šimice, Michele Le Blanc Ilona Šimice Michele Le Blanc (Gar.)</i>	Z	2	0P+2C	*	v
2046156	<b>English Conversation</b> <i>Ilona Šimice, Michele Le Blanc</i>	Z	2	0P+2C	L	v
2046071	<b>English - Lower Intermediate</b> <i>Ilona Šimice, Michaela Schusová, Hana Volejníková, Veronika Kratochvílová</i>	Z	2	0P+2C	L	v
2046070	<b>English - Lower Intermediate</b> <i>Ilona Šimice, Michaela Schusová, Hana Volejníková, Veronika Kratochvílová Michaela Schusová Ilona Šimice (Gar.)</i>	Z	2	0P+2C	Z	v
2046074	<b>English - Advanced</b> <i>Ilona Šimice, Michaela Schusová, Hana Volejníková, Veronika Kratochvílová, Michele Le Blanc Michaela Schusová Ilona Šimice (Gar.)</i>	Z	2	0P+2C	Z	v
2046075	<b>English - Advanced</b> <i>Ilona Šimice, Michaela Schusová, Hana Volejníková, Veronika Kratochvílová, Michele Le Blanc Ilona Šimice Ilona Šimice (Gar.)</i>	Z	2	0P+2C	L	v
2046072	<b>English - Upper Intermediate</b> <i>Ilona Šimice, Michaela Schusová, Hana Volejníková, Veronika Kratochvílová Michaela Schusová Ilona Šimice (Gar.)</i>	Z	2	0P+2C	Z	v
2046073	<b>English - Upper Intermediate</b> <i>Ilona Šimice, Michaela Schusová, Hana Volejníková, Veronika Kratochvílová Ilona Šimice Ilona Šimice (Gar.)</i>	Z	2	0P+2C	L	v
2046068	<b>English - Beginners</b> <i>Ilona Šimice, Michaela Schusová, Hana Volejníková, Veronika Kratochvílová Michaela Schusová Ilona Šimice (Gar.)</i>	Z	2	0P+2C	Z	v
2046069	<b>English - Beginners</b> <i>Ilona Šimice, Michaela Schusová, Hana Volejníková, Veronika Kratochvílová Ilona Šimice</i>	Z	2	0P+2C	L	v
2046126	<b>Czech Lower Intermediate</b> <i>Jaroslava Kommová</i>	Z	2	0P+2C	L	v
2046125	<b>Czech Lower Intermediate</b> <i>Jaroslava Kommová</i>	Z	2	0P+2C	Z	v

2046118	<b>Czech -Advanced</b> <i>Jaroslava Kommová</i>	Z	2	0P+2C	L	v
2046117	<b>Czech -Advanced</b> <i>Jaroslava Kommová</i>	Z	2	0P+2C	Z	v
2046127	<b>Czech - Upper Intermediate</b> <i>Jaroslava Kommová</i>	Z	2	0P+2C	Z	v
2046128	<b>Czech - Upper Intermediate</b> <i>Jaroslava Kommová</i>	Z	2	0P+2C	L	v
2046119	<b>Czech Language for Beginners I.</b> <i>Jaroslava Kommová</i>	Z	2	0P+2C	Z	v
2046120	<b>Czech Language for Beginners II.</b> <i>Jaroslava Kommová</i>	Z	2	0P+2C	L	v
2046086	<b>French - Lower Intermediate Course</b> <i>Michaela Schusová, Dušana Jirovská</i> <b>Michaela Schusová</b> <i>Michaela Schusová (Gar.)</i>	Z	2	0P+2C	Z	v
2046087	<b>French - Lower Intermediate Course</b> <i>Michaela Schusová, Dušana Jirovská</i> <b>Dušana Jirovská</b> <i>Dušana Jirovská (Gar.)</i>	Z	2	0P+2C	L	v
2046091	<b>French - Advanced</b> <i>Michaela Schusová, Dušana Jirovská</i> <b>Dušana Jirovská</b> <i>Dušana Jirovská (Gar.)</i>	Z	2	0P+2C	L	v
2046090	<b>French - Advanced</b> <i>Michaela Schusová, Dušana Jirovská, Eliška Vítková</i> <b>Eliška Vítková</b> <i>Eliška Vítková (Gar.)</i>	Z	2	0P+2C	Z	v
2046089	<b>French - Upper Intermediate</b> <i>Michaela Schusová, Dušana Jirovská</i> <b>Dušana Jirovská</b> <i>Dušana Jirovská (Gar.)</i>	Z	2	0P+2C	L	v
2046088	<b>French - Upper Intermediate</b> <i>Michaela Schusová, Dušana Jirovská</i> <b>Michaela Schusová</b> <i>Michaela Schusová (Gar.)</i>	Z	2	0P+2C	Z	v
2046084	<b>French - Beginners</b> <i>Michaela Schusová, Dušana Jirovská</i> <b>Michaela Schusová</b> <i>Michaela Schusová (Gar.)</i>	Z	2	0P+2C	Z	v
2046085	<b>French - Beginners' Course</b> <i>Michaela Schusová, Dušana Jirovská</i> <b>Michaela Schusová</b> <i>Dušana Jirovská (Gar.)</i>	Z	2	0P+2C	L	v
2146060	<b>Indonesian Language Course for Exchange</b>	Z	2	0P+2C	*	v
2146061	<b>Technical Indonesian - Course I.</b>	Z	2	0P+2C	Z	v
2144062	<b>Technical Indonesian - Course II.</b>	Z,ZK	3	1P+2C	L	v
2046078	<b>German - Lower Intermediate Course</b> <i>Michaela Schusová, Jaroslava Kommová, Eliška Vítková, Petr Laurich</i> <b>Michaela Schusová</b> <i>Michaela Schusová (Gar.)</i>	Z	2	0P+2C	Z	v
2046079	<b>German - Lower Intermediate Course</b> <i>Michaela Schusová, Jaroslava Kommová, Eliška Vítková, Petr Laurich</i> <b>Eliška Vítková</b> <i>Jaroslava Kommová (Gar.)</i>	Z	2	0P+2C	L	v
2046083	<b>German - Advanced Course</b> <i>Michaela Schusová, Jaroslava Kommová, Eliška Vítková, Petr Laurich</i> <b>Jaroslava Kommová</b> <i>Jaroslava Kommová (Gar.)</i>	Z	2	0P+2C	L	v
2046082	<b>German - Advanced Course</b> <i>Michaela Schusová, Jaroslava Kommová, Eliška Vítková, Petr Laurich</i> <b>Michaela Schusová</b> <i>Michaela Schusová (Gar.)</i>	Z	2	0P+2C	Z	v
2046081	<b>German - Upper Intermediate Course</b> <i>Michaela Schusová, Jaroslava Kommová, Eliška Vítková, Petr Laurich</i> <b>Eliška Vítková</b> <i>Jaroslava Kommová (Gar.)</i>	Z	2	0P+2C	L	v
2046080	<b>German - Upper Intermediate Course</b> <i>Michaela Schusová, Jaroslava Kommová, Eliška Vítková, Petr Laurich</i> <b>Michaela Schusová</b> <i>Michaela Schusová (Gar.)</i>	Z	2	0P+2C	Z	v
2046076	<b>German - Beginners</b> <i>Michaela Schusová, Jaroslava Kommová, Eliška Vítková, Petr Laurich</i> <b>Michaela Schusová</b> <i>Petr Laurich (Gar.)</i>	Z	2	0P+2C	Z	v
2046077	<b>German - Beginners</b> <i>Michaela Schusová, Jaroslava Kommová, Eliška Vítková, Petr Laurich</i> <b>Eliška Vítková</b> <i>Jaroslava Kommová (Gar.)</i>	Z	2	0P+2C	L	v
2046161	<b>Presentations in English</b> <i>Michaela Schusová</i>	Z	2	0P+2C	*	v
2046166	<b>Presentations in Czech</b> <i>Jaroslava Kommová</i>	Z	2	0P+2C	*	v
2046162	<b>Presentations in German</b> <i>Jaroslava Kommová, Eliška Vítková, Petr Laurich</i> <b>Jaroslava Kommová</b> <i>Jaroslava Kommová (Gar.)</i>	Z	2	0P+2C	*	v
2046164	<b>Presentations in Russian</b> <i>Dušana Jirovská</i>	Z	2	0P+2C	*	v
2046163	<b>Presentations in French language</b> <i>Dušana Jirovská</i> <b>Dušana Jirovská</b>	Z	2	0P+2C	*	v
2046165	<b>Presentations in Spanish</b> <i>Eliška Vítková</i>	Z	2	0P+2C	*	v



2046137	<b>Russian - Lower Intermediate Course</b> <i>Michaela Schusová, Hana Volejníková, Dušana Jirovská, Eliška Vítková</i> <b>Michaela Schusová</b> Michaela Schusová (Gar.)	Z	2	0P+2C	Z	v
2046138	<b>Russian - Lower Intermediate Course</b> <i>Michaela Schusová, Hana Volejníková, Dušana Jirovská</i> <b>Dušana Jirovská</b>	Z	2	0P+2C	L	v
2046141	<b>Russian - Advanced</b> <i>Michaela Schusová, Hana Volejníková, Dušana Jirovská, Eliška Vítková</i> <b>Michaela Schusová</b> Michaela Schusová (Gar.)	Z	2	0P+2C	Z	v
2046142	<b>Russian - Advanced</b> <i>Michaela Schusová, Hana Volejníková, Dušana Jirovská</i> <b>Dušana Jirovská</b>	Z	2	0P+2C	L	v
2046140	<b>Russian - Upper Intermediate</b> <i>Michaela Schusová, Hana Volejníková, Dušana Jirovská</i> <b>Dušana Jirovská</b>	Z	2	0P+2C	L	v
2046139	<b>Russian - Upper Intermediate</b> <i>Michaela Schusová, Hana Volejníková, Dušana Jirovská, Eliška Vítková</i> <b>Michaela Schusová</b> Michaela Schusová (Gar.)	Z	2	0P+2C	Z	v
2046136	<b>Russian - Beginners</b> <i>Michaela Schusová, Hana Volejníková, Dušana Jirovská</i> <b>Dušana Jirovská</b>	Z	2	0P+2C	L	v
2046135	<b>Russian - Beginners</b> <i>Michaela Schusová, Hana Volejníková, Dušana Jirovská, Eliška Vítková</i> <b>Michaela Schusová</b> Michaela Schusová (Gar.)	Z	2	0P+2C	Z	v
2046099	<b>Spanish - Lower Intermediate</b> <i>Michaela Schusová, Jaime Andrés Villagómez</i> <b>Eliška Vítková</b> Jaime Andrés Villagómez (Gar.)	Z	2	0P+2C	L	v
2046098	<b>Spanish - Lower Intermediate</b> <i>Michaela Schusová, Eliška Vítková, Jaime Andrés Villagómez</i> <b>Eliška Vítková</b> Eliška Vítková (Gar.)	Z	2	0P+2C	Z	v
2046096	<b>Spanish - Beginners</b> <i>Michaela Schusová, Eliška Vítková, Jaime Andrés Villagómez</i> <b>Eliška Vítková</b> Eliška Vítková (Gar.)	Z	2	0P+2C	Z	v
2046097	<b>Spanish - Beginners</b> <i>Michaela Schusová, Jaime Andrés Villagómez</i> <b>Jaime Andrés Villagómez</b> Jaime Andrés Villagómez (Gar.)	Z	2	0P+2C	L	v

**Characteristics of the courses of this group of Study Plan: Code=12B\*\*1V-DOP ZJK Name=06 2012 doporu ené základní jazykové kurzy a prezentace**

2046155	English Conversation Improving communicative skills in speaking on general topics and general technical topics.	Z	2
2046156	English Conversation Improving communicative skills in speaking on general topics and general technical topics.	Z	2
2046071	English - Lower Intermediate Mapped to the Common European Framework of Reference Level A2 Aim: Understanding clearly spoken language about everyday situations which a student meets either at school or at his/her free time and speaking about them. Writing in a simple way about familiar topics. reading and comprehension of simple texts. Improvement of professional language.	Z	2
2046070	English - Lower Intermediate Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language. A1 - A2.	Z	2
2046074	English - Advanced The aim: comprehension of spoken English as well as lectures given in English without great difficulties and active participation in a discussion. Written and oral skills on advanced level. Ability to write a summary, a report, an essay. reading and comprehension of popular-scientific and scientific articles or texts from student's field of studies without difficulties. Grammar structures on advanced level. B1 - B2.	Z	2
2046075	English - Advanced Mapped to the Common European Framework of Reference Level B1 - B2. The aim: comprehension of spoken English as well as lectures given in English without great difficulties and active participation in a discussion. Written and oral skills on advanced level. Ability to write a summary, a report, an essay. reading and comprehension of popular-scientific and scientific articles or texts from student's field of studies without difficulties. Grammar structures on advanced level.	Z	2
2046072	English - Upper Intermediate The aim is to extend language skills taking into consideration professional English and common professional terminology. Comprehension of standard English speech and conversation about topics of everyday life - at school, at work, during free time, on intermediate level. Broadening grammar knowledge. A2 - B1.	Z	2
2046073	English - Upper Intermediate Mapped to the Common European Framework of Reference Level B1. The aim is to extend language skills taking into consideration professional English and common professional terminology. Comprehension of standard English speech and conversation about topics of everyday life - at school, at work, during free time, on intermediate level. Broadening grammar knowledge.	Z	2
2046068	English - Beginners Aim: Basic vocabulary of everyday life in a written and spoken form. Understanding and use of basic expressions of general scientific terminology (professional language). A1	Z	2
2046069	English - Beginners Mapped to the Common European Framework of Reference Level A1 Aim: Basic vocabulary of everyday life in a written and spoken form. Understanding and use of basic expressions of general scientific terminology (professional language).	Z	2
2046126	Czech Lower Intermediate Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.	Z	2
2046125	Czech Lower Intermediate 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
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

2046117	Czech -Advanced	Z	2
Comprehension of spoken language as well as lectures in Czech on topics familiar to the student. Communication with native speakers, participation in discussions. Expressing opinions. Written skills. Ability to write an essay or a report. Reading and understanding texts concerning current issues and popular scientific and technical articles.			
2046127	Czech - Upper Intermediate	Z	2
Understanding standard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ability to describe experiences and events, briefly explain one's opinions and plans. Reading and understanding general and technical texts.			
2046128	Czech - Upper Intermediate	Z	2
Mapped to the Common European Framework of Reference Level A2-B1. The aim is to extend language skills taking into consideration professional Czech and common professional terminology. Comprehension of standard Czech speech and conversation about topics of everyday life - at school, at work, during free time, on intermediate level. Broadening the knowledge technical language.			
2046119	Czech Language for Beginners I.	Z	2
Basic vocabulary of everyday life in a spoken and written form. Understanding and use of basic expressions of general scientific terminology (professional language)			
2046120	Czech Language for Beginners II.	Z	2
Mapped to the Common European Framework of Reference Level A1 Aim: Basic vocabulary of everyday life in a written and spoken form. Understanding and use of basic expressions of general scientific terminology (professional language).			
2046086	French - Lower Intermediate Course	Z	2
Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2046087	French - Lower Intermediate Course	Z	2
Mapped to the level of Common European Framework of Reference: A2 Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2046091	French - Advanced	Z	2
Mapped to the level of Common European Framework of reference: B1 - B2 Comprehension of spoken language as well as lectures in French on topics familiar to the student. Communication with native speakers, participation in discussions. Expressing opinions. Written skills. Ability to write an essay or a report. Reading and understanding texts concerning current issues and popular scientific and technical articles.			
2046090	French - Advanced	Z	2
Comprehension of spoken language as well as lectures in French on topics familiar to the student. Communication with native speakers, participation in discussions. Expressing opinions. Written skills. Ability to write an essay or a report. Reading and understanding texts concerning current issues and popular scientific and technical articles.			
2046089	French - Upper Intermediate	Z	2
Mapped to the level of Common European Framework of Reference:A2 - B1 Understanding standard speech about familiar topics, that a students comes across at work, at school, during free time, and talking about these topics. Ability to describe experiences and events, explain one's opinions and plans. Reading and understanding general and technical texts.			
2046088	French - Upper Intermediate	Z	2
Understanding standard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ability to describe experiences and events, briefly explain one's opinions and plans. Reading and understanding general and technical texts.			
2046084	French - Beginners	Z	2
Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2046085	French - Beginners' Course	Z	2
Mapped to the level of Common European Framework of Reference: A1 Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2146060	Indonesian Language Course for Exchange	Z	2
Basic of Indonesian Language for Student Exchange Program to Indonesia			
2146061	Technical Indonesian - Course I.	Z	2
Second part of Indonesian Language for Student Exchange Program to Indonesia			
2144062	Technical Indonesian - Course II.	Z,ZK	3
Basic of Indonesian Language for Student Exchange Program to Indonesia			
2046078	German - Lower Intermediate Course	Z	2
Aim: Understanding clearly what is spoken about everyday situations which a student meets in the company or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2046079	German - Lower Intermediate Course	Z	2
Mapped to the level of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a student meets either at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. reading and comprehension of simple texts. Improvement of professional language.			
2046083	German - Advanced Course	Z	2
Mapped to the level of Common European Framework of Reference: B1 - B2 The aim: comprehension of spoken German as well as lectures given in German without great difficulties and active participation in a discussion. Written and oral skills on advanced level. Ability to write a summary, a report, an essay. Reading and comprehension of popular-scientific and scientific articles or texts from student's field of studies without difficulties. Grammar structures on advanced level.			
2046082	German - Advanced Course	Z	2
Comprehension of spoken language as well as lectures in German on topics familiar to the student. Communication with native speakers, participation in discussions. Expressing opinions. Written skills. Ability to write an essay or a report. Reading and understanding texts concerning current issues and popular scientific and technical articles.			
2046081	German - Upper Intermediate Course	Z	2
Mapped to the level of Common European Framework of Reference:A2 - B1 Understanding standard speech about familiar topics, that a students comes across at work, at school, during free time, and talking about these topics. Ability to describe experiences and events, explain one's opinions and plans. Reading and understanding general and technical texts.			
2046080	German - Upper Intermediate Course	Z	2
Understanding standard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ability to describe experiences and events, briefly explain one's opinions and plans. Reading and understanding general and technical texts.			
2046076	German - Beginners	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) It corresponds to the Common European Framework of Reference for Languages A1.			
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 Preparing students to present in English on technical topics, with a possible co-operation with specialized departments.	Z	2
2046166	Presentations in Czech Preparing students to give presentations in English on technical topics, with a possible co-operation with specialized departments.	Z	2
2046162	Presentations in German Preparation for presenting technical topics in German, possibly in cooperation with specialized departments.	Z	2
2046164	Presentations in Russian Preparation for presenting technical topics in Russian, possibly in cooperation with specialized departments.	Z	2
2046163	Presentations in French language Preparation for presenting technical topics in French, possibly in cooperation with specialized departments.	Z	2
2046165	Presentations in Spanish Preparation for presenting technical topics in Spanish, possibly in cooperation with specialized departments.	Z	2
2046137	Russian - Lower Intermediate Course Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.	Z	2
2046138	Russian - Lower Intermediate Course Mapped to the level of Common European Framework of Reference: A2 Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.	Z	2
2046141	Russian - Advanced Comprehension of spoken language as well as lectures in Russian on topics familiar to the student. Communication with native speakers, participation in discussions. Expressing opinions. Written skills. Ability to write an essay or a report. Reading and understanding texts concerning current issues and popular scientific and technical articles.	Z	2
2046142	Russian - Advanced Mapped to the level of Common European Framework of reference: B1 - B2 Comprehension of spoken language as well as lectures in Russian on topics familiar to the student. Communication with native speakers, participation in discussions. Expressing opinions. Written skills. Ability to write an essay or a report. Reading and understanding texts concerning current issues and popular scientific and technical articles.	Z	2
2046140	Russian - Upper Intermediate Mapped to the level of Common European Framework of Reference: A2 - B1 Understanding standard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ability to describe experiences and events, briefly explain one's opinions and plans. Reading and understanding general and technical texts.	Z	2
2046139	Russian - Upper Intermediate Understanding standard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ability to describe experiences and events, briefly explain one's opinions and plans. Reading and understanding general and technical texts.	Z	2
2046136	Russian - Beginners Mapped to the level of Common European Framework of Reference: A1 Basic vocabulary of everyday life in a spoken and written form. Understanding and use of basic expressions of general scientific terminology (professional language)	Z	2
2046135	Russian - Beginners Basic vocabulary of everyday life in a spoken and written form. Understanding and use of basic expressions of general scientific terminology (professional language)	Z	2
2046099	Spanish - Lower Intermediate Mapped to the level of Common European Framework of Reference A2 Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.	Z	2
2046098	Spanish - Lower Intermediate Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.	Z	2
2046096	Spanish - Beginners Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.	Z	2
2046097	Spanish - Beginners Mapped to the Common European Framework of Reference Level A1. Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.	Z	2

### List of courses of this pass:

Code	Name of the course	Completion	Credits
2011009	Mathematics III An introductory course in ordinary differential equation and infinite series.	Z,ZK	5
2011021	Constructive Geometry The subject is focused on geometric objects in the space - curves, surfaces and solids and their properties and mutual relations.	Z,ZK	6
2011056	Mathematics I In the course, greater emphasis is placed on the theoretical basis of the concepts discussed and on the derivation of basic relationships and connections between concepts. Students will also get to know the procedures for solving problems with parametric input. In addition, students will gain extended knowledge in some thematic areas: eigenvalues and eigenvectors of a matrix, Taylor polynomial, integral as a limit function, integration of some special functions.	Z,ZK	8
2011062	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 The aim: comprehension of spoken English as well as lectures given in English without great difficulties and active participation in a discussion. Written and oral skills on advanced level. Ability to write a summary, a report, an essay. reading and comprehension of popular-scientific and scientific articles or texts from student's field of studies without difficulties. Grammar structures on advanced level. B1 - B2.	Z	2
2046075	English - Advanced Mapped to the Common European Framework of Reference Level B1 - B2. The aim: comprehension of spoken English as well as lectures given in English without great difficulties and active participation in a discussion. Written and oral skills on advanced level. Ability to write a summary, a report, an essay. reading and comprehension of popular-scientific and scientific articles or texts from student's field of studies without difficulties. Grammar structures on advanced level.	Z	2

2046076	German - Beginners	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) It corresponds to the Common European Framework of Reference for Languages A1.			
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 in the company 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 current 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 current issues and popular scientific and technical articles.			
2046091	French - Advanced	Z	2
Mapped to the level of Common European Framework of reference: B1 - B2 Comprehension of spoken language as well as lectures in French on topics familiar to the student. Communication with native speakers, participation in discussions. Expressing opinions. Written skills. Ability to write an essay or a report. Reading and understanding texts concerning current issues and popular scientific and technical articles.			
2046096	Spanish - Beginners	Z	2
Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2046097	Spanish - Beginners	Z	2
Mapped to the Common European Framework of Reference Level A1. Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2046098	Spanish - Lower Intermediate	Z	2
Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2046099	Spanish - Lower Intermediate	Z	2
Mapped to the level of Common European Framework of Reference A2 Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.			
2046117	Czech -Advanced	Z	2
Comprehension of spoken language as well as lectures in Czech on topics familiar to the student. Communication with native speakers, participation in discussions. Expressing opinions. Written skills. Ability to write an essay or a report. Reading and understanding texts concerning current issues and popular scientific and technical articles.			
2046118	Czech -Advanced	Z	2
Mapped to the level of Common European Framework of Reference: B1- B2 The aim: comprehension of spoken Czech as well as lectures given in Czech without great difficulties and active participation in a discussion. Written and oral skills on advanced level. Ability to write a summary, a report, an essay. Reading and comprehension of popular-scientific and scientific articles or texts from student's field of studies without difficulties. Grammar structures on advanced level.			
2046119	Czech Language for Beginners I.	Z	2
Basic vocabulary of everyday life in a spoken and written form. Understanding and use of basic expressions of general scientific terminology (professional language)			

2046120	Czech Language for Beginners II. 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
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
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	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.			
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.			
2321067	Technical Application of Materials	Z,ZK	5
P ední popisuje aplikovatelnost jednotlivých skupin inženýrských materiálů a jejich odpovídající vlastnosti. Rovněž se v ní uvádí aktuální vývojové trendy těchto skupin. The subject describes applicability of specific engineering material types and their characteristics. It deals with the current development trends in these materials as well.			
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.			
2322041	Heat treatment	KZ	4
Theoretical fundamentals of heat treatment, basic processes of heat and chemical-heat treatment of ferrous and non-ferrous metals, excursion focused on the given topic			
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.			
2331065	Design Consideration	Z,ZK	5
Relations between design, production technique and economic aspects. Design considerations in casting, forming, welding, machining and assembly techniques. Basis for material and production technology selection. Component detailing for manufacture. CNC basis and using CNC.			
2331068	Technology I.	Z,ZK	5
Foundry properties of metals. Treatment. Pouring. Casting solidification. Moulding and core making. Thermal treatment. Plastic deformation. Division of forming processes. Semi-products, heating-up. Cutting. Cold and hot forming. Welds. Weldability. Weldment testing. Thermal cutting. Brazing. Surface treatments.			
2331071	Automation of Production Processes	Z,ZK	5
Automation of basic technological processes - casting, welding, forming and finishing. Facilities and equipment required to automate offices. Mechanization and automation in iron and steel foundries. Automation and robotics of die casting process, including other peripherals. Designing and programming of robotic welding centers. Designing and programming of robotic workstations for sheet metal forming. Design of automated forging cells. Design of automated finishing lines.			
2331505	Welding Technology	Z,ZK	4
2331506	Casting and Forming Technology	Z,ZK	5
Principles of selection of the manufacturing method for semi-finished products. Production planning and production processes in the foundry. Production processes for forgings, extrusion. Accuracy, stock material, utilized equipment. Production processes for stampings. Manufacturing of stampings, presses and equipment. Plastic mouldings. Individual projects for production of a casting, forging or a stamping.			
2332038	Surface Treatment Technology	KZ	4
TPU The course is an introduction to the topic of finishes (meaning and objectives of the field). They are introduced to the basics of corrosion distribution and its species. TPU focuses on corrosion protection in engineering and other industries. Are reconstructed surface preparation processes (mechanical, chemical). Among the discussed technologies finishes include coating technologies (such as electroplating, zinc plating) technology conversion layers, further application of organic coatings. An important issue is also ecological aspects, Technological design and testing in the field of surface treatment.			
2332056	Preparations and Tools	KZ	3
Principles of selection of the manufacturing method for semi-finished products. Production planning and production processes in the foundry. Production processes for forgings. Accuracy, stock material, utilized equipment. Production processes for stampings. Manufacturing of stampings, presses and equipment. Production processes for weldments. Operational sequence, filler materials, equipment. Plastic mouldings. Individual projects for production of a casting, forging or a stamping.			
2332091	Project	KZ	2
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.			
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.			
2333993	Bachelor Thesis	Z	5
2341014	Technology II.	Z,ZK	5
mechanics of chip formation, cutting processes, finishing operations, non-traditional machining processes. Production rates calculation, machining economics. Automation of processes, programming of manufacture. Engineering metrology. Assembly techniques. Introduction to process planning.			
2342005	Quality Control	KZ	2
Basic quality control terms, where is quality created, who is responsible for a quality. Basic statistical terms and distributions. Statistical methods: statistical process control, statistical sampling. Tools and methods for a quality assurance during product lifetime cycle. Standards 9 000 and 14 000, certification of quality control systems.			
2342091	Project	KZ	2
Work on specialized tasks.			
2372041	Computer Support for Study	KZ	3
The course introduces students into creating technical and professional documents on computers or Web and into realizing technical computations with the use of computers. Students gain practical skills by creating an essay in a text editor, by realizing technical computations with a spreadsheet calculator, and by creating technical-based WWW page.			
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

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

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