# Study plan

# Name of study plan: 06 40 45 48 DSTR EPT 2012 K základ

Faculty/Institute/Others:

Department:

Branch of study guaranteed by the department: Welcome page

Garantor of the study branch:

Program of study: Bachelor of Mechanical Engineering

Type of study: Bachelor combined

Required credits: 114

Elective courses credits: 124 Sum of credits in the plan: 238

Note on the plan: SP12DSTR-K MUSTR # SP12DSTR-TZP-K # SP12BSTR-TZP-K # první pokus

Name of the block: Compulsory courses in the program

Minimal number of credits of the block: 37

The role of the block: P

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

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

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

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

Credits in the group: 20 Note on the group:

| Code    | Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.) | Completion | Credits | Scope | Semester | Role |
|---------|---|------------|---------|-------|----------|------|
| 2151165 | Hydraulic and Pneumatic Machines Pavel Mosler, Michal Kolovratník, Jan Melichar Jan Melichar Jan Melichar (Gar.)  | Z,ZK       | 5       | 2P+2C | *        | Р    |
| 2151090 | Industry power and heating plant Michal Kolovratník, František Hrdli ka, Lukáš Pila Michal Kolovratník František Hrdli ka (Gar.)                          | Z,ZK       | 5       | 2P+2C | *        | Р    |
| 2151554 | Thermal Turbines Michal Kolovratník Ond ej Bartoš Michal Kolovratník (Gar.)   | Z,ZK       | 5       | 2P+2C | *        | Р    |
| 2151559 | Heat Exchangers and Boilers<br>Tomáš Dlouhý Pavel Skopec Tomáš Dlouhý (Gar.)  | Z,ZK       | 5       | 2P+2C | *        | Р    |

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

| 2151165   | Hydraulic and Pneumatic Machines   | Z,ZK               | 5         |  |
|---|--|--------------------|-----------|--|
| Classificiation and principles of operation of hydraulic machines. Criterions of hydrodynamical similarity. Hydraulic systems. Differend types of pumps, construction, capacity control |  |                    |           |  |
| and operation in variou   | is conditions. Theory of compression processes. Constructions, calculation, capacity control of compressors, operation with vi | arious gases. Refi | igerating |  |
| compressors. Accesso  | ries of a compressor stations and plants. Economical and ecological problems of a compressed air production and distribution   | ٦.                 |           |  |
| 2151090   | Industry power and heating plant   | Z,ZK               | 5         |  |
| 2151554   | Thermal Turbines   | Z,ZK               | 5         |  |
| 2151559   | Heat Exchangers and Boilers  | Z,ZK               | 5         |  |

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

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

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

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

Credits in the group: 17 Note on the group:

| Code    | Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.) | Completion | Credits | Scope | Semester | Role |
|---------|---|------------|---------|-------|----------|------|
| 2151118 | Distributed Energy Michal Kolovratník, Jakub Maš uch Michal Kolovratník Michal Kolovratník (Gar.)   | Z,ZK       | 5       | 2P+2C | *        | Р    |
| 2151117 | Design of Power Facilities  Lukáš Pila Lukáš Pila   | Z,ZK       | 5       | 2P+2C | *        | Р    |
| 2153006 | Technology of Air Protection in Power Engineering  Jan Hrdli ka   | Z          | 2       | 0P+2C | *        | Р    |
| 2151158 | Principles of Refrigerating Technology and Heat Pumps  Michal Kolovratník. Miroslav Petrák Miroslav Petrák  | Z,ZK       | 5       | 2P+2C | *        | Р    |

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

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

Code of the group: 12DSK1P-KMEN

Name of the group: 00 2012 D kmenové 1. semestr STR kombinované

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, Vojt ch B lohlav, Stanislav Solna , Jan Sko ilas Radek Šulc Radek Šulc (Gar.)   | KZ         | 3       | 2P+1C | 1        | Р    |
| 2011021 | Constructive Geometry Ivana Linkeová   | Z,ZK       | 6       | 3P+2C | *        | Р    |
| 2383008 | Managerial Psychology  | Z          | 2       | 1P+1C | *        | Р    |
| 2011056 | Mathematics I<br>Radka Keslerová, Marta Hlavová, Ji í Holman, Gejza Dohnal, Marta ertíková,<br>Vladimír Hric, Nikola Pajerová, Petr Louda, Lukáš Hájek, Radka<br>Keslerová Gejza Dohnal (Gar.) | Z,ZK       | 8       | 4P+4C | *        | Р    |
| 2372041 | Computer Support for Study Vladimír Hlavá  | KZ         | 3       | 1P+1C | *        | Р    |
| 2132001 | Engineering Design I.  Karel Petr  | KZ         | 2       | 1P+2C | 1        | Р    |
| 2131005 | History of Technology  | ZK         | 3       | 2P+0C | 1        | Р    |
| K333038 | Fundamentals of Technology I.  | Z          | 3       | 8B    | *        | Р    |

| Characteristics of | the courses of this group of Study Plan: Code=12DSK1P-KMEN Name=00 2012 D kmenové 1. s | emestr STR k | kombinované | <u></u> |
|--------------------|--|--------------|-------------|---------|
| 0400040            | Ob a maintain .  | 1/7          |             | 1       |

| 2182019                 | Cnemistry  | KZ !                | j 3            |
|-------------------------|--|---------------------|----------------|
| General chemistry from  | the point of view of mechanical and process engineering. Physical chemistry forms 2/3 of the course (structure and propertie   | es of matter, therr | nodynamics,    |
| phase equilibrium, chen | nical reactions, reaction engineering), the remaining 1/3 is devoted to organic chemistry (hydrocarbons, polymers) and biochemistry (hydrocarbons, polymers) | emistry. Laborato   | ry practice is |
| oriented upon the mater | ial properties measurement.  |                     |                |

| 2011021                | Constructive Geometry  | Z,ZK | 6 |
|------------------------|--|------|---|
| The subject is focused | he subject is focused on geometric objects in the space - curves, surfaces and solids and their properties and mutual relations. |      |   |
| 2383008                | Managerial Psychology  | Z    | 2 |
| 2011056                | Mathematics I  | Z,ZK | 8 |

In the course, greater emphasis is placed on the theoretical basis of the concepts discussed and on the derivation of basic relationships and connections between concepts. Students will also get to know the procedures for solving problems with parametric input. In addition, students will gain extended knowledge in some thematic areas: eigennumbers and eigenvectors of a matrix, Taylor polynomial, integral as a limit function, integration of some special functions.

## 2372041 Computer Support for Study

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 repre   | sentation, dimensioning and tolerancing |    |   |  |  |
| 2131005  | History of Technology                   | ZK | 3 |  |  |
| Developement of human knowledge in the domain of science and technology in the retrospective of the developement 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.

K333038 Fundamentals of Technology I.

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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: 12DSK2P-KMEN

Name of the group: 00 2012 D kmenové 2. semestr STR kombinované

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

Credits in the group: 0

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 | *        | Р    |
| 2011062 | Matematika II.<br>Radka Keslerová   | Z,ZK       | 8       | 4P+4C | *        | Р    |
| 2322029 | Materials Science I. Jakub Horník, Jana Sobotová, Ji í Cejp, Elena ižmárová, Pavlína Hájková, Stanislav Krum, Jan Kr il, Vladimír Mára, Lucie Pilsová, Jana Sobotová Jana Sobotová (Gar.) | KZ         | 3       | 2P+1L | 2        | Р    |
| 2012037 | Computer Graphics Marta Hlavová, Ji í Holman, Nikola Pajerová, Martin Hanek, Jan Karel, Ivana Linkeová, Jaroslav Cibulka Ivana Linkeová   | KZ         | 3       | 1P+1C | *        | Р    |
| 2131002 | Engineering Design II Martin Dub, Jan Flek, Martin Havlí ek, Jan Kanaval, Karel Petr, Marek Štádler, Jan Hoidekr Karel Petr Karel Petr (Gar.)   | Z,ZK       | 4       | 2P+3C | 2        | Р    |

### Characteristics of the courses of this group of Study Plan: Code=12DSK2P-KMEN Name=00 2012 D kmenové 2. semestr STR kombinované

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.

| 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, surfa- | ace texture, geom | etrical tolerance. |

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.

Code of the group: 12DSK3P-KMEN

Name of the group: 00 2012 D kmenové 3. semestr STR kombinované

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

Credits in the group: 0

Note on the group:

12B\*\*3P-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 |
|---------|---|------------|---------|-------|----------|------|
| 2021025 | Physics II.   | Z,ZK       | 4       | 1P+2L | 3        | Р    |
| 2011009 | Mathematics III Radka Keslerová, Ji í Holman, Gejza Dohnal, Marta ertíková, Vladimír Hric, Jan Valášek, Lud k Beneš, Tomáš Bodnár, Tomáš Neustupa, Stanislav Kra mar Stanislav Kra mar (Gar.) | Z,ZK       | 5       | 2P+2C | *        | Р    |
| 2311101 | Mechanics I.  Pavel Bastl, Václav Bauma, Petr Beneš, Ivo Bukovský, Martin Ne as, Zden k Neusser, Jan Pelikán, Pavel Steinbauer, Zbyn k Šika, Michael Valášek Michael Valášek (Gar.)           |            | 4       | 2P+2C | *        | Р    |

| 2321039 | Materials Science II.  Jakub Horník, Jana Sobotová, Ji í Cejp, Elena ižmárová, Jan Walter, Pavlína Hájková, Stanislav Krum, Jan Kr il. Vladimír Mára, Stanislav Krum                                     | Z,ZK | 4 | 2P+2L | * | Р |
|---------|--|------|---|-------|---|---|
|         | Jana Sobotová (Gar.)   | 1    | l |       |   |   |
| 2133013 | Engineering Design III. Jan Kanaval, Jan Hoidekr, František Lopot, David Skalický, Roman Uhlí Jan Hoidekr Jan Hoidekr (Gar.)   | Z    | 2 | 0P+2C | Z | Р |
| 2121023 | Thermodynamics   | Z,ZK | 5 | 3P+2C | * | Р |
| 2012035 | Algorithmization and Programming Fundamentals Ji í Holman, Marta ertíková, Vladimír Hric, Lukáš Hájek, Jan Halama, Vladimír Prokop, Martin Hanek, Jan Karel, Josef Musil, Petr Svá ek Petr Svá ek (Gar.) |      | 4 | 1P+2C | * | Р |

Characteristics of the courses of this group of Study Plan: Code=12DSK3P-KMEN Name=00 2012 D kmenové 3. semestr STR kombinované

2021025 Physics II. Z.ZK 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 mature 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 An introductory course in ordinary differential equation and infinite series Z,ZK 2311101 4 Mechanics I.

Mechanics I deals with the basic concepts of statics. There are described the methods of solution of equilibrium of particles and rigid bodies and their systems with and without friction. There are introduced the methods of description of position and motion of particles and rigid bodies.

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 ther

technical iron-carbon alloys, non-ferrous metals and their alloys, plastics, structural ceramics, composites, selection of materials. Engineering Design III. Z

Design of assembly unit (draft drawing, detail drawing, assembly drawing, technical report)

2121023 Thermodynamics Z.ZK 5 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.

2012035 Algorithmization and Programming Fundamentals

ΚZ Programming in MATLAB and its programming language. MATLAB command line. Elementary commands, variable, assignment and expression. Matrices, vectors and operations. Writting M-script. Input and output. Condition and cycle. Algorithmization of simple problems in MATLAB. Graphical commands. Matrix operations. Systems of linear equations. Scripts and functions. Structure of program. Variables, expressions, assignment, and input / output commands. switch. For cycle. Arrays and files. Pointers. Structures. Algorithmization of simple programs: minimum, mean, norm, numerical integration, bisection method, Newton method, matrix operations. Direct methods for solution of systems of linear equations.

Code of the group: 12DSK4P-KMEN

Name of the group: 00 2012 D kmenové 4. semestr STR kombinované

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

Credits in the group: 0

Note on the group:

12B\*K4P-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 |
|---------|---|------------|---------|-------|----------|------|
| 2311102 | Mechanics II. Pavel Bastl, Václav Bauma, Petr Beneš, Ivo Bukovský, Martin Ne as, Zden k Neusser, Jan Pelikán, Pavel Steinbauer, Zbyn k Šika, Michael Valášek Václav Bauma (Gar.)            | Z,ZK       | 4       | 2P+2C | *        | Р    |
| 2121500 | Fluid Dynamics  | Z,ZK       | 5       | 3P+2C | *        | Р    |
| 2011049 | Numerical Mathematics<br>Radka Keslerová, Ji í Holman, Marta ertíková, Vladimír Hric, Petr Louda,<br>Lukáš Hájek, Jan Valášek, Lud k Beneš, Tomáš Bodnár, Petr Svá ek<br>Petr Svá ek (Gar.) | Z,ZK       | 4       | 2P+2C | 4        | Р    |
| 2133014 | Engineering Design IV. František Lopot František Lopot (Gar.)   | Z          | 2       | 0P+2C | L        | Р    |
| K331068 | Technology I  | Z,ZK       | 5       | 16B   | *        | Р    |

#### Characteristics of the courses of this group of Study Plan: Code=12DSK4P-KMEN Name=00 2012 D kmenové 4. semestr STR kombinované

2311102 Mechanics II.

Kinematics of point and of rigid bodies. Transformation matrix. Kinematics of concurrent movements. Motion: translation, rotation, general planar motion, spherical motion, screw motion, general spatial motion. Composition of mechanisms. Basic planar mechanisms. Analytical methods in kinematics of mechanisms - Trigonometric and vector method. Graphical methods in kinematics. Basic theory of gearing. Transmition mechanisms with geers. Strutting and seezing in mechanisms. Cable mechanisms.

Fluid Dynamics

The basic course in fluid dynamics deals with fundamental laws of hydrostatics and hydrodynamics and their application on the basic problems, as 1D flow in ducts, estimation of pressure losses, simplified solution of unsteady flow. Basic information on more complicated problems (laminar and turbulent flow, boundary layer theory, flow sepparatrion) are introduced as well.

| 2011049 | Numerical Mathematics | Z,ZK | 4 |
| Numerical solution of systems of linear equations, iterative methods. Numerical solution of nonlinear algebraic equations. Least squares method. Numerical solution of ordinary differential equations, initial and boundary value problems. Numerical solution of basic linear partial differential equations by finite difference method.

| 2133014 | Engineering Design IV. | Z | 2 |
| K331068 | 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. Brasing. Surface treatment.

Code of the group: 12DSK5P-KMEN

Name of the group: 00 2012 D kmenové 5. semestr STR kombinované

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

Credits in the group: 0

12B\*K5P-KMEN #

| note on the group | ); 12D NOF-   | IXIVILIN # |         |          |          |      |
|-------------------|---|------------|---------|----------|----------|------|
| 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 |
| 2131512           | Machine Elements and Mechanisms I.  Martin Dub, Martin Havlí ek, Jan Kanaval, Karel Petr, Marek Štádler, Eliška Cézová, Zden k ešpíro, Jan Hoidekr, František Lopot, František Lopot František Lopot (Gar.) | Z,ZK       | 6       | 3P+2C    | *        | Р    |
| 2141504           | Electric Circuits and Electronics<br>Stanislava Papežová, Jan Chyský, Jaroslav Novák, Lukáš Novák <b>Jaroslav</b><br><b>Novák</b> Jan Chyský (Gar.)   | Z,ZK       | 4       | 2P+0C+2L | *        | Р    |
| 2311108           | Mechanics III.  Michael Valášek   | Z,ZK       | 6       | 2P+2C    | *        | Р    |
| 2372083           | Measurement in Engineering<br>Martin Novák, Vladimír Hlavá Martin Novák Martin Novák (Gar.)   | KZ         | 3       | 1P+0C+2L | *        | Р    |
| K341014           | Technology II.  | Z,ZK       | 5       | 8KP+8KC  | *        | Р    |
| 2153005           | Fundamentals of Energy Conversions<br>Michal Kolovratník, Tomáš Dlouhý, Ond ej Bartoš, Václav Dostál, Zden k<br>Funda, Miroslav Gleitz, Jan Havlík, Št pán Hrouda, Jitka Jeníková, Jan<br>Havlík            | Z          | 1       | 1P+1C    | *        | Р    |
| 2383001           | Fundamentals of Law<br>Václav Pilík Václav Pilík (Gar.)   | Z          | 2       | 1P+1C    | *        | Р    |

Characteristics of the courses of this group of Study Plan: Code=12DSK5P-KMEN Name=00 2012 D kmenové 5. semestr STR kombinované

| 2131512 | Machine Elements and Mechanisms I. |  |
|---------|------------------------------------|--|
|         |                                    |  |

Z,ZK 6

Joints and joining elements (screwed, clamped, splined, welded, riveted, soldered and adhesive joints; joints with use of feathers, pins, tenons, cotters, keys). Mechanical transmissions (belt, chain, friction, gear drives). Seminars are devoted to practical individual solution of simple design projects - tasks with motion screws, preloaded connecting bolts, clamped, pressed, splined and key joints between shafts and hubs and tasks with welded and riveted joints. Sketching of machine elements and their simple assembly units is also indispensable seminar work.

| 2141504 | Electric Circuits and Electronics | Z,ZK | 4 |
|---------|-----------------------------------|------|---|
|---------|-----------------------------------|------|---|

Introduction into theory of electrical circuits, analysis special types of electrical circuits as DC and AC. Transient states in circuits with accumulators of energy. El. Power and Energy. Introduction into electronics. Principle and typical parameters of basic semiconductor components. Application in electronic circuits (rectifier, stabilizer, power control, operational amplifier). Analogue and digital circuits. Principle of analogue and digital signal processing. Logical circuits, converters, microprocessor.

| 2311106                 | Mechanics III.  | Z,ZN               | 0         |  |
|-------------------------|---|--------------------|-----------|--|
| 2372083                 | Measurement in Engineering  | KZ                 | 3         |  |
| Overview of sensor prin | ciples for measurement of non-electrical variables (temperature, position, force, speed, acceleration, torque). Calibration and | verification of me | asurement |  |
| instruments.            |   |                    |           |  |

| K341014 | Technology II.                     | Z,ZK | 5 |
|---------|------------------------------------|------|---|
| 2153005 | Fundamentals of Energy Conversions | Z    | 1 |
| 2383001 | Fundamentals of Law                | 7    | 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: 12DSK6P-KMEN

Name of the group: 00 2012 D kmenové 6. semestr STR kombinované

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

Credits in the group: 0

Note on the group: 12B\*\*6P-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 |
|---------|--|------------|---------|------------|----------|------|
| 2371047 | Automatic Control Milan Hofreiter, R žena Petrová, Tomáš Vyhlídal, Jaromír Fišer Tomáš Vyhlídal Tomáš Vyhlídal (Gar.)  | Z,ZK       | 5       | 3P+15C+05L | *        | Р    |
| 2131026 | Machine Elements and Mechanisms II  Martin Dub, Jan Flek, Jan Kanaval, Karel Petr, Eliška Cézová, Zden k ešpíro, František Lopot, Ji í Houkal František Lopot František Lopot (Gar.) | ZK         | 3       | 3P+0C      | *        | Р    |
| 2141505 | Electrical machines and drives Michael Valášek, Jan Chyský, Jaroslav Novák, Lubomír Musálek Jaroslav Novák Jan Chyský (Gar.)   | Z,ZK       | 4       | 2P+0C+2L   | *        | Р    |
| 2133025 | Design František Lopot František Lopot (Gar.)  | Z          | 4       | 0P+4C      | *        | Р    |
| 2381054 | Management and Economics of the Enterprise Olga Heralová, Št pánka Uli ná, Vladimír Brdek, Petr Žemli ka Olga Heralová (Gar.)  | Z,ZK       | 4       | 2P+2C      | *        | Р    |
| 2181026 | Momentum, Mass and Heat Transfer  Martin Dostál, Vojt ch B lohlav, Stanislav Solna, Jan Sko ilas, Tomáš Jirout,  Adam Krupica, Ji í Moravec <b>Tomáš Jirout</b> Tomáš Jirout (Gar.)  | Z,ZK       | 5       | 3P+1C      | *        | Р    |

#### Characteristics of the courses of this group of Study Plan: Code=12DSK6P-KMEN Name=00 2012 D kmenové 6. semestr STR kombinované

2371047 | Automatic Control | Z,ZK | 5
Automatic controllers are important part of many industrial processes. The goal of this course is to introduce students into basic knowledge of automatic control theory and practice like transfer functions, open versus closed loop control, design of controllers and frequency based analysis of control systems. The course also concentrates on logic control and control via programmable logic controllers. Some seminaries are arranged in laboratories where practical skills and control engineering methods are trained. Students begin to work with MATLAB software as a common platform of control engineers.

2131026 | Machine Elements and Mechanisms II | ZK | 3 | Preliminary design, design calculations and aplication of axles and shafts, sliding and rolling bearings, shaft connections, elements of crank mechanism, pipelines and their accessories

and fittings.

2141505 Electrical machines and drives Z,ZK 4

AC el. curcuits. Electrical power and energy. Calculation, measurement, power factor. Magnetic circuit, materials, hysteresis loop. Electromagnet. Transformer, principle, construction, 3-phase transformer, operating conditions, rated (scheduled) values. Induction machine, principle, construction, operating conditions. Starting, speed-torque characteristic, speed control. Synchronous machines. DC-machines, principle, parameters, operating conditions, construction, starting, speed control, speed-torque characteristic. Low-voltage instruments. Low-voltage distribution system.

2133025 Design

Design, design calculations and their aplications in case of geared transmissions, axles and shafts, sliding and rolling bearings, shaft couplings and clutches.

2381054 Management and Economics of the Enterprise

The course is designed to give students the understanding of economic principles. The economical part of the course is consisted from: explanation of relationship between costs and revenues, expenses and income, concept of investment and calculations per product, presentation how to assemble a basic operating budget and explanation of the basic structure of the financial statements. The management introduces the basic managerial functions and their contents, the uses of network analysis in project management, with the application

of the financial statements. The management introduces the basic managerial functions and their contents, the uses of network analysis in project management, with the application of multi-criteria decision, the basics of marketing and strategic management.

2181026 | Momentum, Mass and Heat Transfer | Z,ZK | 5

Fundamentals of transport phenomena balances in homogeneous fluids. Navier-Stokes equations. Momentum transport in turbulent flows. Mechanical energy equation. Residence time distributions in continuous systems. Conduction heat transfer. Forced and natural convection heat transfer with phase changes and thermal radiation. Multicomponent systems. Mass transfer by molecular diffusion, convection, with chemical reactions and interphase mass transfer.

Name of the block: Compulsory elective courses

Minimal number of credits of the block: 45

The role of the block: PV

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

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

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

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

Credits in the group: 2

Note on the group:

Ze skupiny humanitních předmětů nutno j e d e n absolvovat

7.7K

| 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 |
|---------|---|------------|---------|-------|----------|------|
| 2383019 | Philosophical Issues Of Individual and Science  | Z          | 2       | 1P+1C | *        | PV   |
| 2383009 | Communication and Dealing with People Jan Horejc Jan Horejc (Gar.)  | Z          | 2       | 1P+1C | *        | PV   |
| 2383008 | Managerial Psychology   | Z          | 2       | 1P+1C | *        | PV   |

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

| 0000000 |  | 7 |   |
|---------|--|---|---|
| 2383008 | Managerial Psychology                          |   | 2 |
| 2383019 | Philosophical Issues Of Individual and Science | Z | 2 |

2383009 Communication and Dealing with People

Human communication represents an irreplaceable phenomenon in human activity, as it is present in practically all of his activities. The same applies (with specific modifications) to

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

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

the activities of managers. So you can't not communicate - you can only communicate badly, well and excellently.

German - Bachelor Exam / FME

Russian - Bachelor Exam / FME

Spanish - Bachelor Exam / FME

Jaroslava Kommová

Vítková

Eliška Vítková, Michaela Schusová, Jaroslava Kommová, Petr Laurich

Eliška Vítková, Michaela Schusová, Hana Volejníková, Dušana Jirovská Eliška

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

2041062

2041065

2041064

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

2

2

0P+2C

0P+2C

0P+2C

Z,ZK

Z,ZK

Z,ZK

Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their Completion Credits Scope Semester Role members) Tutors, authors and guarantors (gar.) **English-Bachelor Exam** Michele Le Blanc, Eliška Vítková, Michaela Schusová, Ilona Šimice, Nina 2041061 Z,ZK 0P+2C PV Procházková Ayyub, Hana Volejníková, Veronika Kratochvílová Nina Procházková Avyub French - Bachelor Exam /FME 2041063 Z,ZK 2 0P+2C PV Michaela Schusová, Dušana Jirovská Eliška Vítková Eliška Vítková (Gar.)

| 2041004                           | Eliška Vítková, | Michaela Schusova | i, Jaime Andrés | Villagómez Elišl | ka Vítková | 2,210      |           | 01 +20    |              | FV     |   |
|-----------------------------------|-----------------|-------------------|-----------------|------------------|------------|------------|-----------|-----------|--------------|--------|---|
| Characteristics of the STR a TZIS | courses of t    | his group of St   | udy Plan: Co    | ode=12B**4Q      | -BZJ S+T   | Name=08 20 | 12 bakala | á ské zko | oušky z jazy | /k prc | > |

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

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

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

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

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

Credits in the group: 2

Note on the group:

Student si vybere předmět příslušný oboru, který studuje

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

| 2162091 | Project             | KZ | 2 | 0P+2C | * | PV |
|---------|---------------------|----|---|-------|---|----|
| 2132503 | Project Ji i Houkal | KZ | 2 | 0P+2C | * | PV |

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

| 2372091              | Project  | KZ       | 2        |  |  |
|----------------------|--|----------|----------|--|--|
| An individual proje  | ct from the branch of specialisation, which student will study on his/her magister level | <u>.</u> | <u> </u> |  |  |
| 2362091              | Project  | KZ       | 2        |  |  |
| 2152091              | Deparmental Project  | KZ       | 2        |  |  |
| 2182091              | Project  | KZ       | 2        |  |  |
| Absolvent se sezn    | Absolvent se seznámí se základy oboru Procesní technika.                                 |          |          |  |  |
| 2162091              | Project  | KZ       | 2        |  |  |
| Student will be info | ormed about basics of environmental engineering and creation of thermal comfort.         | ·        |          |  |  |
| 2132503              | Project  | KZ       | 2        |  |  |
| I = 1                |  |          |          |  |  |

Elaboration of semester global project of mechanical drive of conveyor composed of electric motor, elastic shaft coupling (respectively V-belt drive), gearbox provided with two pairs of mating gears and compensating double-row toothed shaft coupling (respectively roller chain drive). Second, alternative arrangement of projected mechanical drive is provided instead of previous gearbox and additional mechanical drives by means of only one single-stage warm gearbox. Elaboration of 4 additional reports analysing production and economic problems of assigned machine element (gearbox shaft or gear). Besides project of mechanical drive must be elaborated design project of crank mechanism and its flywheel for assigned single-cylinder piston engine.

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

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

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

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

Credits in the group: 4

Note on the group:

2363091 nesepsán Student si vybere předmět příslušný oboru, který studuje

| Code    | Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.) | Completion | Credits | Scope | Semester | Role |
|---------|---|------------|---------|-------|----------|------|
| 2133091 | Presentation of Project Ji í Houkal   | Z          | 4       | 4B    | *        | PV   |
| 2153091 | Presentation of Project  Václav Dostál  | Z          | 4       | 4B    | *        | PV   |
| 2363091 | Project Presentation  | Z          | 4       | 4B    |          | PV   |
| 2183091 | Project Presentation Tomáš Jirout   | Z          | 4       | 0P+4C | *        | PV   |
| 2373091 | Project presentation  | Z          | 4       | 4B    | *        | PV   |
| 2163091 | Project Presentation  | Z          | 4       | 4B    | *        | PV   |

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

| 2133091                  | Presentation of Project  | Z                  | 4                |  |  |  |  |
|--------------------------|--|--------------------|------------------|--|--|--|--|
| 2153091                  | Presentation of Project  | Z                  | 4                |  |  |  |  |
| 2363091                  | Project Presentation   | Z                  | 4                |  |  |  |  |
| 2183091                  | Project Presentation   | Z                  | 4                |  |  |  |  |
| Preparation and prese    | ntation of a given project theme.  |                    |                  |  |  |  |  |
| 2373091                  | Project presentation   | Z                  | 4                |  |  |  |  |
| Diploma thesis or bach   | elor work presentation. Student should study the presentation software possibilities and proposition of the department. Stude  | nt should prepare  | the presentation |  |  |  |  |
| of actual version of his | diploma or bachelor work and present it in the face of the other student. The presentation will continue with discussion. Cons | equently, the worl | k should be      |  |  |  |  |
| presented as a pdf file  | presented as a pdf file on a temporal web page.  |                    |                  |  |  |  |  |
| 2163091                  | Project Presentation   | Z                  | 4                |  |  |  |  |
| Processing and preser    | Processing and presentation of engaged theme   |                    |                  |  |  |  |  |

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

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

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

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

Credits in the group: 5

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

Ústav procesní a zpracovatelské techniky

| Code    | Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)                             | Completion | Credits | Scope | Semester | Role |
|---------|---|------------|---------|-------|----------|------|
| 2183707 | Project I.<br>Radek Šulc, Lukáš Krátký Lukáš Krátký Lukáš Krátký (Gar.)   | Z          | 5       | 0P+7C | *        | PV   |
| 2153707 | Project I. Michal Kolovratník, Jan Melichar, František Hrdli ka, Lukáš Pila , Tomáš Dlouhý, Jakub Maš uch, Ond ej Bartoš, Václav Dostál, Jan Havlík, Pavel Skopec Tomáš Dlouhý (Gar.) |            | 5       | 0P+7C | *        | PV   |

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

| 2183707                 | Project I. | Z | 5 |
|-------------------------|------------|---|---|
| Project, dimensioning a |            |   |   |
| 2153707                 | Project I. | Z | 5 |

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

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

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

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

Credits in the group: 5 Note on the group:

| Code    | Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.) | Completion | Credits | Scope | Semester | Role |
|---------|---|------------|---------|-------|----------|------|
| 2181502 | Hydromechanical Equipment Tomáš Jirout Tomáš Jirout Tomáš Jirout (Gar.)   | Z,ZK       | 5       | 2P+2C | *        | PV   |
| 2151002 | Nuclear Power Principles  Václav Dostál, Pavel Zácha, Václav Železný Václav Dostál Václav Dostál (Gar.)   | Z,ZK       | 5       | 2P+2C | *        | PV   |

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

| 2181502                  | Hydromechanical Equipment   | Z,ZK | 5 |  |  |  |  |  |
|--------------------------|---|------|---|--|--|--|--|--|
| Design, principles and b | Design, principles and basic calculations of following equipment: pipes and pipe networks, packed and bubble columns, filters, settlers, centrifuges and cyclones, fluidized beds, mixing |      |   |  |  |  |  |  |
| equipment, silos and co  | enveyors, crushers and mills, granulators, extruders, injection and blow moulding machines, rolls and calenders.  |      |   |  |  |  |  |  |
| 2151002                  | Nuclear Power Principles  | Z,ZK | 5 |  |  |  |  |  |

Physical fundamentals of nuclear energy. Development and heat removal from core. Basic materials for nuclear reactors. Basic types of nuclear reactors. Review of advanced types of nuclear reactors. Fuel cycle. Reactor radiation, detection and quantification, determination of radiation doses. Problems of nuclear safety and technical provisions.

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

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

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

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

Credits in the group: 5

Note on the group: Kód předmětu Bakalářská práce se zapisuje podle ústavu: 2153985 Ústav energetiky

2183985 Ústav procesní a zpracovatelské techniky

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

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

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

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

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

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

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

Credits in the group: 20

Note on the group:

Ze skupiny PV předmětů nutno d v a volit

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

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

2181507 Diffusion separation equipment Z,ZK 5
Classis from Equipment for diffusion separation processes are giving a basic knowledge of processes and equipments where gas or liquid mixture is been separated due to principals of physical-chemical equilibriums or on the basis of mass transfer mechanisms. They are used for concentrating of products from dilute solutions or in turn for purification of diluted gasses or liquid solutions.

| 2152028               | Energy Audit and Legislation  | KZ   | 5 |  |  |  |  |  |
|-----------------------|---|------|---|--|--|--|--|--|
| 2151702               | Renewable Energy Sources  | Z,ZK | 5 |  |  |  |  |  |
| 2181508               | Heat transfer equipments  | Z,ZK | 5 |  |  |  |  |  |
| Eundomontolo of thorm | Fundamentals of thermodynamics and conductive and convective heat transfer Enthalmy halonging Technical thermodynamics and hadis thermodynamics and explanation and convective heat transfer Enthalmy halonging Technical thermodynamics and hadis thermodynamics |      |   |  |  |  |  |  |

Fundamentals of thermodynamics and conductive and convective heat transfer. Enthalpy balancing. Technical thermodynamics and basic thermodynamic cycles. Functional description mechanical design, thermal and hydraulic design of a heat exchangers, evaporators and dryers.

Name of the block: Elective courses

Minimal number of credits of the block: 32

The role of the block: V

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

Name of the group: 02 2012 ALFA volitelné pro STR

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

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

Credits in the group: 32

Note on the group: Předměty typu Alfa (A) nejsou u studijního programu B2341 Strojírenství povinné, avšak jsou povinné u studijního programu B2342 Teoretický základ strojního inženýrství

povinné u studijního programu B2342 Teoretický základ strojního inženýrství.

| Code    | Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members)  Tutors, authors and guarantors (gar.) | Completion | Credits | Scope | Semester | Role |
|---------|--|------------|---------|-------|----------|------|
| 202A041 | Physics I.   | ZK         | 3       | 0P+0L | *        | V    |
| 202A025 | Physics II.A   | ZK         | 2       | 0P+0C | *        | V    |
| 201A021 | Constructive Geometry A  Ivana Linkeová  | ZK         | 3       | 0P+0C | *        | V    |
| 201A056 | Mathematics I.A<br>Radka Keslerová   | ZK         | 4       | 0P+0C | *        | V    |
| 201A062 | Mathematics II.A<br>Radka Keslerová  | ZK         | 4       | 0P+0C | *        | V    |
| 201A009 | Mathematics III.A<br>Stanislav Kra mar   | ZK         | 2       | 0P+0C | *        | V    |
| 231A101 | Mechanics I.A Michael Valášek  | ZK         | 2       | 0P+0C | *        | V    |
| 231A102 | Mechanics II.A<br>Michael Valášek  | ZK         | 2       | 0P+0C | *        | V    |
| 212A500 | Fluid Dynamics A   | ZK         | 3       | 0P+0C | *        | V    |
| 201A049 | Numerical Mathematics A Lud k Beneš  | ZK         | 2       | 0P+0C | *        | V    |
| 212A023 | Thermodynamics A   | ZK         | 2       | 0P+0C | *        | V    |

Characteristics of the courses of this group of Study Plan: Code=12BS\*\*V-ALFA Name=02 2012 ALFA voliteIné pro STR

| 202A041                   | Physics I.  | ∠K                | 3                   |
|---------------------------|---|-------------------|---------------------|
| Kinematics and dynamic    | es of a particle motion. Principle of conservation of energy. System of particles, centre of mass. Rigid body. Continuum, elastic | properties of bod | lies. Oscillations, |
| waves. Fluid mechanics    | . Temperature and heat transfer. Kinetic theory of gases. Thermodynamics. Electric field, current, conductivity, resistance. Co   | nductors, semicor | nductors,           |
| insulators. Magnetic fiel | d. Magnetic materials. Laboratories - accuracy of measurements, systematic and random errors, uncertainty of direct and inc       | direct measureme  | nts, regression,    |
| measurements of 11 va     | rious experiments related to the lectures   |                   |                     |

202A025 Physics II.A ZK 2

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 mature 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.

| 201A021                    | Constructive Geometry A   | ZK | 3 |  |  |
|----------------------------|---|----|---|--|--|
| The subject is focused     | 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 alg | 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.

| 201A009 | Mathematics III.A | ZK | 2 |
|---------|-------------------|----|---|
| 231A101 | Mechanics I.A     | ZK | 2 |
| 231A102 | Mechanics II.A    | ZK | 2 |
| 212A500 | Fluid Dynamics A  | ZK | 3 |

The basic course in fluid dynamics deals with fundamental laws of hydrostatics and hydrodynamics and their application on the basic problems, as 1D flow in ducts, estimation of pressure losses, simplified solution of unsteady flow. Basic information on more complicated problems (laminar and turbulent flow, boundary layer theory, flow sepparatrion) are introduced as well.

| 201A049 | Numerical Mathematics A | ZK | 2 |
|---------|-------------------------|----|---|
| 212A023 | Thermodynamics A        | ZK | 2 |

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

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

Name of the group: 05 2012 doporu ené seminá e

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

Credits in the group: 0

Note on the group: Pokud si chce student své dosud získané znalosti (například z matematiky, fyziky, cizích jazyků

atd.) doplnit, může si zapsat některý z volitelných předmětů, které příslušné ústavy pro 1. semestr

(zimní) vypisují. Doporučujeme zejména předměty uvedené v této skupině

| Code    | Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.) | Completion | Credits | Scope | Semester | Role |
|---------|---|------------|---------|-------|----------|------|
| 2026016 | Physics - Seminar   | Z          | 2       | 0P+2C | 1        | V    |
| 2016007 | Mathematics I Seminar<br>Radka Keslerová, Olga Majlingová Radka Keslerová   | 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 r | 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) Tutors, authors and guarantors (gar.)                            | Completion | Credits | Scope | Semester | Role |
|---------|--|------------|---------|-------|----------|------|
| 2046155 | English Conversation Michele Le Blanc, Eliška Vítková, Ilona Šimice, Nina Procházková Ayyub Nina Procházková Ayyub Michele Le Blanc (Gar.)   | Z          | 2       | 0P+2C | *        | V    |
| 2046156 | English Conversation Michele Le Blanc, Eliška Vítková, Ilona Šimice, Nina Procházková Ayyub Nina Procházková Ayyub   | Z          | 2       | 0P+2C | L        | V    |
| 2046071 | English - Lower Intermediate Eliška Vítková, Michaela Schusová, Ilona Šimice, Nina Procházková Ayyub, Hana Volejníková, Veronika Kratochvílová                                       | Z          | 2       | 0P+2C | L        | V    |
| 2046070 | English - Lower Intermediate Eliška Vítková, Michaela Schusová, Ilona Šimice, Nina Procházková Ayyub, Hana Volejníková, Veronika Kratochvílová Michaela Schusová Ilona Šimice (Gar.) | Z          | 2       | 0P+2C | Z        | V    |

| 2046074 | English - Advanced Michele Le Blanc, Eliška Vítková, Michaela Schusová, Ilona Šimice, Nina Procházková Ayyub, Hana Volejníková, Veronika Kratochvílová Michaela Schusová Ilona Šimice (Gar.) | Z    | 2 | 0P+2C | Z | V   |
|---------|--|------|---|-------|---|-----|
| 2046075 | English - Advanced Michele Le Blanc, Eliška Vítková, Michaela Schusová, Ilona Šimice, Nina Procházková Ayyub, Hana Volejníková, Veronika Kratochvílová Ilona Šimice                          | Z    | 2 | 0P+2C | L | V   |
| 2046072 | English - Upper Intermediate  Eliška Vítková, Michaela Schusová, Ilona Šimice, Nina Procházková Ayyub,  Hana Volejníková, Veronika Kratochvílová Michaela Schusová Ilona Šimice (Gar.)       | Z    | 2 | 0P+2C | Z | V   |
| 2046073 | English - Upper Intermediate  Eliška Vítková, Michaela Schusová, Ilona Šimice, Nina Procházková Ayyub,  Hana Volejníková, Veronika Kratochvílová Ilona Šimice                                | Z    | 2 | 0P+2C | L | V   |
| 2046068 | English - Beginners  Eliška Vitková, Michaela Schusová, Ilona Šimice, Hana Volejníková, Veronika  Kratochvílová <b>Michaela Schusová</b> Ilona Šimice (Gar.)                                 | Z    | 2 | 0P+2C | Z | V   |
| 2046069 | English - Beginners Eliška Vítková, Michaela Schusová, Ilona Šimice, Nina Procházková Ayyub, Hana Volejníková, Veronika Kratochvílová Ilona Šimice   | Z    | 2 | 0P+2C | L | V   |
| 2046126 | Czech Lower Intermediate  Jaroslava Kommová  | Z    | 2 | 0P+2C | L | V   |
| 2046125 | Czech Lower Intermediate  Jaroslava Kommová  | Z    | 2 | 0P+2C | Z | V   |
| 2046118 | Czech -Advanced Jaroslava Kommová  | Z    | 2 | 0P+2C | L | V   |
| 2046117 | Czech -Advanced  | Z    | 2 | 0P+2C | Z | V   |
| 2046127 | Jaroslava Kommová  Czech - Upper Intermediate  | Z    | 2 | 0P+2C | Z | V   |
| 2046128 | Jaroslava Kommová  Czech - Upper Intermediate  | Z    | 2 | 0P+2C | L | V   |
| 2046119 | Jaroslava Kommová  Czech Language for Beginners I.   | Z    | 2 | 0P+2C | Z | V   |
| 2046120 | Jaroslava Kommová  Czech Language for Beginners II.  | <br> | 2 | 0P+2C |   | V   |
| 2046086 | Jaroslava Kommová  French - Lower Intermediate Course Michaela Schusová, Dušana Jirovská Michaela Schusová Michaela  | Z    | 2 | 0P+2C | Z | V   |
| 2046087 | Schusová (Gar.) French - Lower Intermediate Course   | Z    | 2 | 0P+2C | L | V   |
| 2046091 | Michaela Schusová, Dušana Jirovská <b>Dušana Jirovská</b> French - Advanced  |      | 2 | 0P+2C | L | V   |
| 2046090 | Michaela Schusová, Dušana Jirovská <b>Dušana Jirovská</b> French - Advanced  Eliška Vítková, Michaela Schusová, Dušana Jirovská <b>Eliška Vítková</b> Eliška                                 | Z    | 2 | 0P+2C | Z | V   |
| 2046089 | Vítková (Gar.)  French - Upper Intermediate  | Z    | 2 | 0P+2C | L | V   |
| 2046088 | Michaela Schusová, Dušana Jirovská <b>Dušana Jirovská</b> French - Upper Intermediate  | 7    | 2 | 0P+2C | Z | .,, |
| 2046088 | Eliška Vítková, Michaela Schusová, Dušana Jirovská <b>Michaela Schusová</b> Michaela Schusová (Gar.)   | Z    | 2 | UP+2C |   | V   |
| 2046084 | French - Beginners Michaela Schusová, Dušana Jirovská <b>Michaela Schusová</b> Michaela Schusová (Gar.)  | Z    | 2 | 0P+2C | Z | V   |
| 2046085 | French - Beginners´ Course Michaela Schusová, Dušana Jirovská Michaela Schusová (Gar.)  Schusová (Gar.)  | Z    | 2 | 0P+2C | L | V   |
| 2146060 | Indonesian Language Course for Exchange  | Z    | 2 | 0P+2C | * | V   |
| 2146061 | Technical Indonesian - Course I.   | Z    | 2 | 0P+2C | Z | V   |
| 2144062 | Technical Indonesian - Course II.  | Z,ZK | 3 | 1P+2C | L | V   |
| 2046078 | German - Lower Intermediate Course  Eliška Vítková, Michaela Schusová, Jaroslava Kommová, Petr Laurich Michaela Schusová Michaela Schusová (Gar.)  | Z    | 2 | 0P+2C | Z | V   |
| 2046079 | German - Lower Intermediate Course Eliška Vítková, Michaela Schusová, Jaroslava Kommová, Petr Laurich Eliška Vítková   | Z    | 2 | 0P+2C | L | V   |
| 2046083 | German - Advanced Course  Eliška Vítková, Michaela Schusová, Jaroslava Kommová, Petr Laurich  Jaroslava Kommová  | Z    | 2 | 0P+2C | L | V   |
| 2046082 | German - Advanced Course  Eliška Vítková, Michaela Schusová, Jaroslava Kommová, Petr Laurich Michaela  Schusová Michaela Schusová (Gar.)   | Z    | 2 | 0P+2C | Z | V   |
| 2046081 | German - Upper Intermediate Course Eliška Vítková, Michaela Schusová, Jaroslava Kommová, Petr Laurich Eliška Vítková   | Z    | 2 | 0P+2C | L | V   |
| 2046080 | German - Upper Intermediate Course Eliška Vítková, Michaela Schusová, Jaroslava Kommová, Petr Laurich Michaela Schusová Michaela Schusová (Gar.)   | Z    | 2 | 0P+2C | Z | V   |

| 2046076 | German - Beginners Eliška Vítková, Michaela Schusová, Jaroslava Kommová, Petr Laurich <b>Michaela</b> Schusová Michaela Schusová (Gar.)             | Z | 2 | 0P+2C | Z | V |
|---------|---|---|---|-------|---|---|
| 2046077 | German - Beginners<br>Eliška Vítková, Michaela Schusová, Jaroslava Kommová, Petr Laurich Eliška<br>Vítková  | Z | 2 | 0P+2C | L | ٧ |
| 2046161 | Presentations in English Eliška Vítková, Michaela Schusová, Ilona Šimice, Nina Procházková Ayyub Michaela Schusová Michaela Schusová (Gar.)         | Z | 2 | 0P+2C | * | V |
| 2046166 | Presentations in Czech<br>Eliška Vítková, Jaroslava Kommová, Petr Laurich <b>Jaroslava Kommová</b> Petr<br>Laurich (Gar.)                           | Z | 2 | 0P+2C | * | ٧ |
| 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 Dušana Jirovská (Gar.)   | Z | 2 | 0P+2C | * | V |
| 2046163 | Presentations in French language<br>Eliška Vítková, Dušana Jirovská Dušana Jirovská (Gar.)  | Z | 2 | 0P+2C | * | V |
| 2046165 | Presentations in Spanish Eliška Vítková Eliška Vítková  | Z | 2 | 0P+2C | * | V |
| 2046137 | Russian - Lower Intermediate Course Eliška Vítková, Michaela Schusová, Hana Volejníková, Dušana Jirovská Michaela Schusová Michaela Schusová (Gar.) | Z | 2 | 0P+2C | Z | V |
| 2046138 | Russian - Lower Intermediate Course Michaela Schusová, Hana Volejníková, Dušana Jirovská Dušana Jirovská  | Z | 2 | 0P+2C | L | V |
| 2046141 | Russian - Advanced Eliška Vítková, Michaela Schusová, Hana Volejníková, Dušana Jirovská Michaela Schusová Michaela Schusová (Gar.)                  | Z | 2 | 0P+2C | Z | V |
| 2046142 | Russian - Advanced<br>Michaela Schusová, Hana Volejníková, Dušana Jirovská <b>Dušana Jirovská</b>   | Z | 2 | 0P+2C | L | V |
| 2046140 | Russian - Upper Intermediate<br>Michaela Schusová, Hana Volejníková, Dušana Jirovská <b>Dušana Jirovská</b>   | Z | 2 | 0P+2C | L | V |
| 2046139 | Russian - Upper Intermediate Eliška Vítková, Michaela Schusová, Hana Volejníková, Dušana Jirovská Michaela Schusová Michaela Schusová (Gar.)        | Z | 2 | 0P+2C | Z | V |
| 2046136 | Russian - Beginners<br>Michaela Schusová, Hana Volejníková, Dušana Jirovská <b>Dušana Jirovská</b>  | Z | 2 | 0P+2C | L | V |
| 2046135 | Russian - Beginners<br>Eliška Vítková, Michaela Schusová, Hana Volejníková, Dušana Jirovská<br>Michaela Schusová Michaela Schusová (Gar.)           | Z | 2 | 0P+2C | Z | V |
| 2046099 | Spanish - Lower Intermediate Michaela Schusová, Jaime Andrés Villagómez Eliška Vítková  | Z | 2 | 0P+2C | L | V |
| 2046098 | Spanish - Lower Intermediate Eliška Vítková, Michaela Schusová, Jaime Andrés Villagómez Eliška Vítková Eliška Vítková (Gar.)                        | Z | 2 | 0P+2C | Z | V |
| 2046096 | Spanish - Beginners<br>Eliška Vítková, Michaela Schusová, Jaime Andrés Villagómez Eliška Vítková<br>Eliška Vítková (Gar.)                           | Z | 2 | 0P+2C | Z | V |
| 2046097 | Spanish - Beginners<br>Michaela Schusová, Jaime Andrés Villagómez Jaime Andrés Villagómez   | 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   | Z                    | 2                 |  |  |  |
|--|--|----------------------|-------------------|--|--|--|
| Improving communicati  | ve skills in speaking on general topics and general technical topics.  | •                    |                   |  |  |  |
| 2046156  | English Conversation   | Z                    | 2                 |  |  |  |
| Improving communicati  | ve skills in speaking on general topics and general technical topics.  | •                    |                   |  |  |  |
| 2046071  | English - Lower Intermediate   | Z                    | 2                 |  |  |  |
| Mapped to the Commo  | n 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 a  | nd speaking about them. Writing in a simple way about familiar topics. reading and comprehension of simple texts. Improvem   | ent of professiona   | al language.      |  |  |  |
| 2046070  | English - Lower Intermediate   | Z                    | 2                 |  |  |  |
| Aim: Understanding cle   | arly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about the   | em. Writing in a sir | nple way about    |  |  |  |
| familiar topics. Reading   | and comprehension of simple texts. Improvement of professional language. A1 - A2.  |                      |                   |  |  |  |
| 2046074  | English - Advanced   | Z                    | 2                 |  |  |  |
| The aim: comprehension   | n of spoken English as well as lectures given in English without great difficulties and active participation in a discussion. Writ   | ten and oral skills  | on advanced       |  |  |  |
| level. Ability to write a s  | ummary, a report, an essay. reading and comprehension of popular-scientific and scientific articles or texts from student's fie  | ld of studies with   | out difficulties. |  |  |  |
| Grammar structures on  | advanced level. B1 - B2.   |                      |                   |  |  |  |
| 2046075  | English - Advanced   | Z                    | 2                 |  |  |  |
| Mapped to the Commo  | n European Framework of Reference Level B1 - B2. The aim: comprehension of spoken English as well as lectures given in E   | English without gre  | eat 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 compre   | hension of popula    | r-scientific and  |  |  |  |
| scientific articles or texts from student's field of studies without difficulties. Grammar structures on advanced level. |  |                      |                   |  |  |  |
| 2046072  | English - Upper Intermediate   | Z                    | 2                 |  |  |  |
| The aim is to extend lan   | 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 everyda  | v life - at school, at work, during free time, on intermediate level. Broadening grammar knowledge, A2 - B1,   |                      |                   |  |  |  |

| 2046073                           | English - Upper Intermediate  | Z                     | 2                    |
|-----------------------------------|---|-----------------------|----------------------|
|                                   | ு Erigiish - Opper intermediate<br>on European Framework of Reference Level B1. The aim is to extend language skills taking into consideration professional Ei  |                       |                      |
| * *                               | ension of standard English speech and conversation about topics of everyday life - at school, at work, during free time, on interr  | -                     | =                    |
| knowledge.                        |   |                       |                      |
| 2046068                           | English - Beginners   | Z                     | 2                    |
|                                   | of everyday life in a written and spoken form. Understanding and use of basic expressions of general scientific terminology (   | professional langua   | <u> </u>             |
| 2046069                           | English - Beginners   | Z                     | . 2                  |
| • • •                             | on European Framework of Reference Level A1 Aim: Basic vocabulary of everyday life in a written and spoken form. Understal<br>minology (professional language).   | nding and use of ba   | asic expression      |
| 2046126                           | Czech Lower Intermediate  | Z                     | 2                    |
|                                   | Czech Lower Intermediate<br>early what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about th  |                       |                      |
| <del>-</del>                      | g and comprehension of simple texts. Improvement of professional language.  | Sin. Writing in a Sin | ipic way abou        |
| 2046125                           | Czech Lower Intermediate  | Z                     | 2                    |
|                                   | early what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about the   | em. Writing in a sin  | nple way abou        |
| familiar topics. Readin           | g and comprehension of simple texts. Improvement of professional language.  |                       |                      |
| 2046118                           | Czech -Advanced   | Z                     | 2                    |
|                                   | Common European Framework of Reference: B1- B2 The aim: comprehension of spoken Czech as well as lectures given in  | _                     |                      |
|                                   | a discussion. Written and oral skills on advanced level. Ability to write a summary, a report, an essay. Reading and comprehen  | nsion of popular-sc   | ientific and         |
|                                   | tts from student's field of studies without difficulties. Grammar structures on advanced level.   |                       |                      |
| 2046117                           | Czech -Advanced ken language as well as lectures in Czech on topics familiar to the student. Communication with native speakers, participation in   | Z Z                   | 2                    |
| -                                 | write an essay or a report. Reading and understanding texts concerning currant issues and popular scientific and technical a  |                       | essing opinior       |
| 2046127                           | Czech - Upper Intermediate  | Z                     | 2                    |
|                                   | rd speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Abi   | 1 1                   |                      |
| -                                 | one's opinions and plans. Reading and understanding general and technical texts.  |                       |                      |
| 2046128                           | Czech - Upper Intermediate  | Z                     | 2                    |
| Mapped to the Commo               | on European Framework of Reference Level A2-B1. The aim is to extend language skills taking into consideration professiona  | al Czech and comm     | non profession       |
|                                   | ension of standard Czech speech and conversation about topics of everyday life - at school, at work, during free time, on inte  | rmediate level. Bro   | adening the          |
| knowledge technical la            | <u> </u>  |                       |                      |
| 2046119                           | Czech Language for Beginners I.   | Z                     | 2                    |
|                                   | eryday life in a spoken and written form. Understanding and use of basic expressions of general scientific terminology (profes  | ssional language)     |                      |
| 2046120                           | Czech Language for Beginners II.  |                       | . 2                  |
| • •                               | on European Framework of Reference Level A1 Aim: Basic vocabulary of everyday life in a written and spoken form. Understal<br>minology (professional language).   | naing and use of ba   | asic expressio       |
| 2046086                           | French - Lower Intermediate Course  | 7                     | 2                    |
|                                   | what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. W   | - 1                   | -                    |
|                                   | omprehension of simple texts. Improvement of professional language.   | g a op.o              | ay abbat lamin       |
| 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 whicl  | n a student meets a   | at school or in      |
| his/her free time and s           | peaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement   | of professional lan   | guage.               |
| 2046091                           | French - Advanced   | Z                     | 2                    |
|                                   | Common European Framework of reference: B1 - B2 Comprehension of spoken language as well as lectures in French on to  | -                     |                      |
|                                   | ative speakers, participation in discussions. Expressing opinions. Written skills. Ability to write an essay or a report. Reading a   | ind understanding t   | exts concerni        |
|                                   | oular scientific and technical articles.  | 7                     | 2                    |
| 2046090<br>Comprehension of spe   | French - Advanced<br>sken language as well as lectures in French on topics familiar to the student. Communication with native speakers, participation   | Z Z                   | 2<br>Everossing      |
|                                   | . Ability to write an essay or a report. Reading and understanding texts concerning currant issues and popular scientific and t   |                       | -xpressing           |
| 2046089                           | French - Upper Intermediate   | Z                     | 2                    |
|                                   | Common European Framework of Reference:A2 - B1 Understanding standard speech about familiar topics, that a students of  |                       |                      |
| during free time, and t           | alking about these topics. Ability to describe experiences and events, explain one's opinions and plans. Reading and underst  | anding general and    | technical tex        |
| 2046088                           | French - Upper Intermediate   | Z                     | 2                    |
| Understanding standa              | rd speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Abi   | lity to describe exp  | eriences and         |
| events, briefly explain           | one's opinions and plans. Reading and understanding general and technical texts.  |                       |                      |
| 2046084                           | French - Beginners  | Z                     | 2                    |
|                                   | what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. W   | riting in a simple wa | ay about famil       |
| -                                 | emprehension of simple texts. Improvement of professional language.   |                       |                      |
| 2046085                           | French - Beginners' Course  Common Furnación Francovark of Reference: A1 Aim: Understanding clearly what is speken about everyday situations which  | Z Z                   | 2<br>at echael or in |
| * *                               | Common European Framework of Reference: A1 Aim: Understanding clearly what is spoken about everyday situations whicl<br>peaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement |                       |                      |
| 2146060                           | Indonesian Language Course for Exchange   | Z                     | guage.<br>2          |
|                                   | nguage for Student Exchange Program to Indonesia  |                       | 2                    |
| 2146061                           | Technical Indonesian - Course I.  | Z                     | 2                    |
|                                   | sian Language for Student Exchange Program to Indonesia   | ı <b>-</b> I          | _                    |
| 2144062                           | Technical Indonesian - Course II.   | Z,ZK                  | 3                    |
|                                   | anguage for Student Exchange Program to Indonesia   | _,_,_,                | 3                    |
| 2046078                           | German - Lower Intermediate Course  | Z                     | 2                    |
|                                   | early what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about the   |                       | <del>-</del>         |
| rum. Onderstanding of             | and comprehension of circula toute. Improvement of professional longuage  |                       |                      |
| <del>-</del>                      | g and comprehension of simple texts. Improvement of professional language.  |                       |                      |
| <del>-</del>                      | German - Lower Intermediate Course  | Z                     | 2                    |
| amiliar topics. Readin<br>2046079 |   | - 1                   |                      |

| 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  |                         |  |                          |                    |
|--|-------------------------|--|--------------------------|--------------------|
| and active participation in a discussion. Writing and colarise who and earlier Activity to write a summary a report, an easily, Reading and comprehension of popular-scientific and control and contro | 2046083                 | German - Advanced Course   | Z                        | 2                  |
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| 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)  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.  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 familia topics. Reading and comprehension of simple texts. Improvement of professional language.  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.  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.  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.  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.  2 Understanding clearly what is spoken about everyday situations which a student meets at school or in h |                         |  | ing and use or bas       | sic expressions    |
| Basic vocabulary of everyday life in a spoken and written form. Understanding and use of basic expressions of general scientific terminology (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.  2046098   Spanish - Lower Intermediate   Z   2  Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  2046096   Spanish - Beginners   Z   2  Aim:Understanding clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  2046097   Spanish - Beginners   Z   2  Mapped to the Common European Framework of Reference Level A1. Aim: Understanding clearly what is spoken about everyday situations which a student meets at school or in   |                         |  | 7                        | 2                  |
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| topics. Reading and comprehension of simple texts. Improvement of professional language.  2046096  |                         | ! •  | . –                      |                    |
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| 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   | -                       |  | 7                        | 2                  |
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| 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   | -                       |  | 7                        | 2                  |
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# List of courses of this pass:

| Code   | Name of the course   | Completion   | Credit   |
|--|--|--|--|
| 2011009  | Mathematics III  | Z,ZK   | 5  |
| 2011201  | An introductory course in ordinary differential equation and infinite series.  | 7 714  |  |
| 2011021  | Constructive Geometry  The subject is focused on geometric objects in the space - curves, surfaces and solids and their properties and mutual relati   | Z,ZK ons.  | 6  |
| 2011049  | Numerical Mathematics  | Z,ZK   | 4  |
| Numerical solution   | of systems of linear equations, iterative methods. Numerical solution of nonlinear algebraic equations. Least squares method. Numerical  | solution of ordinar  | y different  |
|  | equations, initial and boundary value problems. Numerical solution of basic linear partial differential equations by finite difference   | method.  |  |
| 2011056  | Mathematics I  | Z,ZK   | 8  |
| n the course, grea   | iter emphasis is placed on the theoretical basis of the concepts discussed and on the derivation of basic relationships and connection   | ns between concep  | ts. Studen   |
| vill also get to knov  | v the procedures for solving problems with parametric input. In addition, students will gain extended knowledge in some thematic areas:  | eigennumbers and e   | eigenvecto   |
|  | of a matrix, Taylor polynomial, integral as a limit function, integration of some special functions.   |  |  |
| 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. Differen   | tial operators div (d  | ivergence  |
|  | Function given implicitly. Local and global (= absolute) extremes of a function of more variables. Double integral, volume (=triple) integral,   |  |  |
|  | Ir, cylindrical and spherical coordinates. A simple smooth curve and line integral of a scalar and vector function. Circulation and Gree<br>ce 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<br>Gauss-Ostrogradskij theorem.   | •  |  |
| 2012035  | Algorithmization and Programming Fundamentals  | KZ   | 4  |
|  | MATLAB and its programming language. MATLAB command line. Elementary commands, variable, assignment and expression. Matr   | 1  |  |
|  | nput and output. Condition and cycle. Algorithmization of simple problems in MATLAB. Graphical commands. Matrix operations. System   |  | -  |
| and functions. St  | tructure of program. Variables, expressions, assignment, and input / output commands. switch. For cycle. Arrays and files. Pointers. S   | tructures. Algorithm   | nization of  |
| simple programs  | s: minimum, mean, norm, numerical integration, bisection method, Newton method, matrix operations. Direct methods for solution of  | systems of linear e  | quations.  |
| 2012037  | Computer Graphics  | KZ   | 3  |
| 2016007  | Mathematics I Seminar  | Z  | 2  |
| 201A009  | Mathematics III.A  | ZK   | 2  |
| 201A021  | Constructive Geometry A  | ZK   | 3  |
| 2017/021   | The subject is focused on geometric objects in the space - curves, surfaces and solids and their properties and mutual relati  | 1  | 3  |
| 201A049  | Numerical Mathematics A  | ZK   | 2  |
| 20170 <del>1</del> 3   | Numerical Mathematics A  |  |  |
| 201 1 0 5 6  | Mathematica I A  |  | 1  |
| 201A056  | Mathematics I.A  | ZK   | 4  |
| 201A062  | Introduction to linear algebra, analytic geometry of straight lines and planes in E3, calculus of functions of one variable  Mathematics II.A  | ZK<br>ZK   | 4  |
| 201A062<br>Open and closed<br>and curl (rotation). For the control of th | Introduction to linear algebra, analytic geometry of straight lines and planes in E3, calculus of functions of one variable  Mathematics II.A set, boundary in E^k. Real function of k-variables. Partial derivatives and differentiability. Gradient and directional derivative. Different Function given implicitly. Local and global (= absolute) extremes of a function of more variables. Double integral, volume (=triple) integral, ur, cylindrical and spherical coordinates. A simple smooth curve and line integral of a scalar and vector function. Circulation and Gree ce 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   | ZK ZK tial operators div (d Fubini theorem. Tra n's theorem. A pote  | 4<br>ivergence<br>nsformation  |
| 201A062<br>Open and closed<br>and curl (rotation). I<br>of integrals to pola<br>field, independen  | Introduction to linear algebra, analytic geometry of straight lines and planes in E3, calculus of functions of one variable  Mathematics II.A set, boundary in E^k. Real function of k-variables. Partial derivatives and differentiability. Gradient and directional derivative. Different Function given implicitly. Local and global (= absolute) extremes of a function of more variables. Double integral, volume (=triple) integral, ir, cylindrical and spherical coordinates. A simple smooth curve and line integral of a scalar and vector function. Circulation and Gree ce 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 Gauss-Ostrogradskij theorem.  | ZK  ZK tial operators div (d Fubini theorem. Tra n's theorem. A pote or field through a su   | 4<br>ivergence<br>nsformati<br>ential vect<br>urface. Th   |
| 201A062<br>Open and closed<br>and curl (rotation). I<br>of integrals to pola<br>field, independent   | Introduction to linear algebra, analytic geometry of straight lines and planes in E3, calculus of functions of one variable  Mathematics II.A set, boundary in E^k. Real function of k-variables. Partial derivatives and differentiability. Gradient and directional derivative. Different Function given implicitly. Local and global (= absolute) extremes of a function of more variables. Double integral, volume (=triple) integral, rr, cylindrical and spherical coordinates. A simple smooth curve and line integral of a scalar and vector function. Circulation and Gree ce 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 Gauss-Ostrogradskij theorem.  Physics II.   | ZK  ZK tial operators div (d Fubini theorem. Tra n's theorem. A pote or field through a su   | 4<br>ivergence<br>nsformati<br>ential vect<br>urface. Th   |
| 201A062 Open and closed and curl (rotation). If of integrals to pola field, independent 2021025 Faraday's law of electors  | Introduction to linear algebra, analytic geometry of straight lines and planes in E3, calculus of functions of one variable  Mathematics II.A set, boundary in E^k. Real function of k-variables. Partial derivatives and differentiability. Gradient and directional derivative. Different Function given implicitly. Local and global (= absolute) extremes of a function of more variables. Double integral, volume (=triple) integral, recording to a scalar and vector function. Circulation and Gree to a line integral on the path. Simple smooth surface and surface integral of a scalar function and a vector function. Flow of a vector Gauss-Ostrogradskij theorem.  Physics II. ectromagnetic induction. Maxwell's equations, electromagnetic waves. Light, wave optics, geometrical optics. Quantum properties of electromagnetic induction.   | ZK  ZK  tial operators div (d  Fubini theorem. Tra n's theorem. A pote or field through a su  Z,ZK  ctromagnetic waves   | 4 ivergence nsformati ential vect urface. Th  4 s. Interacti   |
| 201A062 Open and closed and curl (rotation). If of integrals to pola field, independent 2021025 Faraday's law of eleof radiation with means and closes.  | Introduction to linear algebra, analytic geometry of straight lines and planes in E3, calculus of functions of one variable  Mathematics II.A set, boundary in E^k. Real function of k-variables. Partial derivatives and differentiability. Gradient and directional derivative. Different function given implicitly. Local and global (= absolute) extremes of a function of more variables. Double integral, volume (=triple) integral, recording to a scalar and vector function. Circulation and Gree to a line integral on the path. Simple smooth surface and surface integral of a scalar function and a vector function. Flow of a vector Gauss-Ostrogradskij theorem.  Physics II. sectromagnetic induction. Maxwell's equations, electromagnetic waves. Light, wave optics, geometrical optics. Quantum properties of elematter. Photoelectric effect. Wave-particle mature of matter. Quantum-mechanical description of particle's motion. Hydrogen atom and   | ZK  ZK  tial operators div (d Fubini theorem. Tra n's theorem. A pote or field through a su  Z,ZK  ctromagnetic waves  | 4 ivergence nsformati ential vect urface. Th  4 s. Interacti f elements  |
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| 201A062 Open and closed and curl (rotation). If of integrals to pola field, independent 2021025 Faraday's law of eleo fradiation with magnetic spectra, x-rays, ;la 2021041  | Introduction to linear algebra, analytic geometry of straight lines and planes in E3, calculus of functions of one variable  Mathematics II.A set, boundary in E^k. Real function of k-variables. Partial derivatives and differentiability. Gradient and directional derivative. Different Function given implicitly. Local and global (= absolute) extremes of a function of more variables. Double integral, volume (=triple) integral, uncompartive of a scalar and vector function. Circulation and Gree ce 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 Gauss-Ostrogradskij theorem.  Physics II.  Sectromagnetic induction. Maxwell's equations, electromagnetic waves. Light, wave optics, geometrical optics. Quantum properties of elematter. Photoelectric effect. Wave-particle mature of matter. Quantum-mechanical description of particle's motion. Hydrogen atom and ser. Band theory of solids, semiconductors. Nucleus, radioactivity, sources of nuclear energy. Laboratories - measurements of 6 experiments.   | ZK  ZK tial operators div (d Fubini theorem. Tra n's theorem. A pote or field through a su  Z,ZK  ctromagnetic waves I periodic system of triments related to t  Z,ZK  | 4 ivergence nsformati ential vect urface. Th  4 s. Interacti f element he lecture  |
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| 201A062 Open and closed and curl (rotation). If of integrals to polar field, independent and curl field fi       | Introduction to linear algebra, analytic geometry of straight lines and planes in E3, calculus of functions of one variable  Mathematics II.A set, boundary in E^k. Real function of k-variables. Partial derivatives and differentiability. Gradient and directional derivative. Different Function given implicitly. Local and global (= absolute) extremes of a function of more variables. Double integral, volume (=triple) integral, ur, cylindrical and spherical coordinates. A simple smooth curve and line integral of a scalar and vector function. Circulation and Gree ce 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 Gauss-Ostrogradskij theorem.  Physics II. sectromagnetic induction. Maxwell's equations, electromagnetic waves. Light, wave optics, geometrical optics. Quantum properties of elematter. Photoelectric effect. Wave-particle mature of matter. Quantum-mechanical description of particle's motion. Hydrogen atom and ser. Band theory of solids, semiconductors. Nucleus, radioactivity, sources of nuclear energy. Laboratories - measurements of 6 experiences of a particle motion. Principle of conservation of energy. System of particles, centre of mass. Rigid body. Continuum, elastic prechanics. Temperature and heat transfer. Kinetic theory of gases. Thermodynamics. Electric field, current, conductivity, resistance. Conservation of energy.   | ZK  ZK tial operators div (d Fubini theorem. Tra n's theorem. A pote or field through a su  Z,ZK ctromagnetic waves I periodic system of triments related to t  Z,ZK operties of bodies. Conductors, semicon   | 4 ivergence insformati ential vect urface. Th  4 is. Interacti f element he lecture 7 Oscillation ductors,   |
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|--------------------------------|---|---------------------------------|-------------------|
|                                | to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.  |                                 |                   |
| 2041064  <br>Mapped to the Com | Spanish - Bachelor Exam / FME mon European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficult to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level. | Z,ZK ties, to take part in c    | 2<br>discussions, |
| 2041065                        | Russian - Bachelor Exam / FME   | Z,ZK                            | 2                 |
| Mapped to the Com              | mon European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficult<br>to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.                            | ies, to take part in o          |                   |
| 2046068                        | English - Beginners abulary of everyday life in a written and spoken form. Understanding and use of basic expressions of general scientific terminology (g  | Z Z                             | 2                 |
| 2046069                        | English - Beginners   | Z                               | 2                 |
| Mapped to the Com              | mon European Framework of Reference Level A1 Aim: Basic vocabulary of everyday life in a written and spoken form. Understanding   | g and use of basic              | expressions       |
| 2046070                        | of general scientific terminology (professional language).  English - Lower Intermediate  | 7                               | 2                 |
|                                | g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them.  familiar topics. Reading and comprehension of simple texts. Improvement of professional language. A1 - A2.                             | Writing in a simple             |                   |
| 2046071                        | English - Lower Intermediate  | Z                               | 2                 |
| Mapped to the Con              | nmon European Framework of Reference Level A2 Aim: Understanding clearly spoken language about everyday situations which a s  |                                 | er at school      |
|                                | time and speaking about them. Writing in a simple way about familiar topics, reading and comprehension of simple texts. Improveme   | nt of professional la           | anguage.          |
| 2046072 The aim is to extend   | English - Upper Intermediate<br>I language skills taking into consideration professional English and common professional terminology. Comprehension of standard En  | │   ∠<br>glish speech and c     |                   |
|                                | about topics of everyday life - at school, at work, during free time, on intermediate level. Broadening grammar knowledge. A2   |                                 |                   |
| 2046073                        | English - Upper Intermediate mmon European Framework of Reference Level B1. The aim is to extend language skills taking into consideration professional Engli   | Z                               | 2                 |
|                                | ehension of standard English speech and conversation about topics of everyday life - at school, at work, during free time, on intermedi   | •                               |                   |
|                                | knowledge.  |                                 |                   |
| 2046074                        | English - Advanced ension of spoken English as well as lectures given in English without great difficulties and active participation in a discussion. Writter   | Z Z                             | 2                 |
| 1                              | te a summary, a report, an essay. reading and comprehension of popular-scientific and scientific articles or texts from student's field   |                                 |                   |
| 0040075                        | Grammar structures on advanced level. B1 - B2.  |                                 |                   |
| 2046075  <br>Mapped to the Co  | English - Advanced<br>mmon European Framework of Reference Level B1 - B2. The aim: comprehension of spoken English as well as lectures given in En  | Z  <br>glish without great      | difficulties      |
|                                | ation in a discussion. Written and oral skills on advanced level. Ability to write a summary, a report, an essay. reading and compreher   |                                 |                   |
| 0040070                        | scientific articles or texts from student's field of studies without difficulties. Grammar structures on advanced level.  | 7                               |                   |
| 2046076 Basic vocal            | German - Beginners<br>bulary of everyday life in a spoken and written form. Understanding and use of basic expressions of general scientific terminology (p   | ∠<br>rofessional langua∉        | ae) 2             |
| 2046077                        | German - Beginners  | Z                               | 2                 |
| Mapped to the leve             | el Common European Framework of Reference A1 Basic vocabulary of everyday life in a written and spoken form. Understanding an<br>general scientific terminology (professional language).  | d use of basic expr             | ressions of       |
| 2046078                        | German - Lower Intermediate Course  | Z                               | 2                 |
| Aim: Understanding             | g 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         |
| 2046079                        | familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  German - Lower Intermediate Course   | Z                               | 2                 |
|                                | of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a   | 1                               |                   |
|                                | time and speaking about them. Writing in a simple way about familiar topics. reading and comprehesion of simple texts. Improvement  | nt of professional la           |                   |
| 2046080                        | German - Upper Intermediate Course andard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ability  | Z Z                             | ences and         |
| Onderstanding sta              | events, briefly explain one's opinions and plans. Reading and understanding general and technical texts.  | to describe experie             | crices and        |
| 2046081                        | German - Upper Intermediate Course  | Z                               | 2                 |
|                                | el of Common European Framework of Reference:A2 - B1 Understanding standard speech about familiar topics, that a students com<br>d talking about these topics. Ability to describe experiences and events, explain one's opinions and plans. Reading and understandi        |                                 |                   |
| 2046082                        | German - Advanced Course  | Z                               | 2                 |
|                                | of spoken language as well as lectures in German on topics familiar to the student. Communication with native speakers, participation   |                                 |                   |
| 2046083                        | Vritten skills. Ability to write an essay or a report. Reading and understanding texts concerning currant issues and popular scientific a<br>German - Advanced Course   | Z                               | es. 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 Ge   | erman without grea              | at difficulties   |
| and active participa           | tion in a discussion. Written and oral skills on advanced level. Ability to write a summary, a report, an essay. Reading and comprehe scientific articles or texts from student's field of studies without difficulties. Grammar structures on advanced level.              | nsion of popular-so             | cientific and     |
| 2046084                        | French - Beginners  | Z                               | 2                 |
| l I                            | rly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing topics. Reading and comprehension of simple texts. Improvement of professional language.  | j in a simple way ab            |                   |
| 2046085                        | French - Beginners' Course  | Z                               | 2                 |
|                                | el of Common European Framework of Reference: A1 Aim: Understanding clearly what is spoken about everyday situations which a  |                                 |                   |
| 2046086                        | e and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement  French - Lower Intermediate Course  | or professional lan             | iguage.           |
|                                | rly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. Writing   |                                 |                   |
| 2046087                        | topics. Reading and comprehension of simple texts. Improvement of professional language.  French - Lower Intermediate Course  | Z                               | 2                 |
| Mapped to the leve             | el of Common European Framework of Reference: A2 Aim: Understanding clearly what is spoken about everyday situations which a  | student meets at s              | chool or in       |
| his/her free time              | e and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement  | ot professional lan             | iguage. I         |

| 2046088   | French - Upper Intermediate  | Z  |  | 2  |
|---|--|--|--|--|
|   | • •  | _  | 1  |  |
| Understanding sta   | andard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ability  | to describe experi   | ences  | and  |
|   | events, briefly explain one's opinions and plans. Reading and understanding general and technical texts.   | _  |  | _  |
| 2046089   | French - Upper Intermediate  | Z  | l .  | 2  |
| Mapped to the leve  | el of Common European Framework of Reference:A2 - B1 Understanding standard speech about familiar topics, that a students con  | nes across at work   | , at sc  | hool,  |
| during free time, an  | d talking about these topics. Ability to describe experiences and events, explain one's opinions and plans. Reading and understandi  | ng general and tec   | hnical   | 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, participatior  | in discussions. Ex   | xpress   | ing  |
| opinions. V   | Vritten skills. Ability to write an essay or a report. Reading and understanding texts concerning currant issues and popular scientific a  | and technical articl   | es.  |  |
| 2046091   | French - Advanced  | 7  |  | 2  |
|   | evel of Common European Framework of reference: B1 - B2 Comprehension of spoken language as well as lectures in French on to   | . –  | l .  |  |
|   | n native speakers, participation in discussions. Expressing opinions. Written skills. Ability to write an essay or a report. Reading and u   |  |  |  |
| Communication with  | currant issues and popular scientific and technical articles.  | inderstanding texts  | COLIC  | Jiiiiig  |
| 20.40000  | · ·  | 7  |  | $\overline{}$  |
| 2046096   | Spanish - Beginners  | Z  | l .  | 2  |
| Aim:Understanding   | g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them.  | vvriting in a simple   | way a  | about  |
|   | familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  |  |  |  |
| 2046097   | Spanish - Beginners  | Z  |  | 2  |
| Mapped to the Co  | ommon European Framework of Reference Level A1. Aim: Understanding clearly what is spoken about everyday situations which a s  | student meets at so  | chool o  | or in  |
| his/her free time   | e and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement   | of professional lar  | nguage   | э.   |
| 2046098   | Spanish - Lower Intermediate   | Z  |  | 2  |
| Understanding clear   | rly 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 al   | bout fa  | amiliar  |
| · ·   | topics. Reading and comprehension of simple texts. Improvement of professional language.   |  |  |  |
| 2046099   | Spanish - Lower Intermediate   | Z  |  | 2  |
|   | opanish - Lower intermediate  I of Common European Framework of Reference A2 Understanding clearly what is spoken about everyday situations which a studer   | _  | 1  |  |
|   |  |  |  | 15/1161  |
|   | nd speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement of   |  |  | _  |
| 2046117   | Czech -Advanced  | Z  | I  | 2  |
| •   | spoken language as well as lectures in Czech on topics familiar to the student. Communication with native speakers, participation in dis   |  | ng opi   | nions.   |
| Writte  | n skills. Ability to write an essay or a report. Reading and understanding texts concerning currant issues and popular scientific and t  | echnical 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 Czec   | ch without great dif   | ficultie   | s and  |
| active participation  | on in a discussion. Written and oral skills on advanced level. Ability to write a summary, a report, an essay. Reading and comprehens  | sion of popular-scie   | entific a  | and  |
|   | scientific articles or texts from student's field of studies without difficulties. Grammar structures on advanced level.   |  |  |  |
| 2046119   | Czech Language for Beginners I.  | 7  |  | 2  |
|   | bulary of everyday life in a spoken and written form. Understanding and use of basic expressions of general scientific terminology (p  | _  | I .  | _  |
|   |  | 7  | · —  | 2  |
| 2046120   | Czech Language for Beginners II.   |  |  |  |
|   |  |  | l  |  |
| Mapped to the Com   | mon European Framework of Reference Level A1 Aim: Basic vocabulary of everyday life in a written and spoken form. Understanding  | g and use of basic   | l  |  |
|   | mon European Framework of Reference Level A1 Aim: Basic vocabulary of everyday life in a written and spoken form. Understanding of general scientific terminology (professional language).   |  | expres   | ssions   |
| Mapped to the Com   | mon European Framework of Reference Level A1 Aim: Basic vocabulary of everyday life in a written and spoken form. Understanding  | g and use of basic   | expres   |  |
| 2046125   | mon European Framework of Reference Level A1 Aim: Basic vocabulary of everyday life in a written and spoken form. Understanding of general scientific terminology (professional language).   | Z  | expres   | ssions<br>2  |
| 2046125   | mon European Framework of Reference Level A1 Aim: Basic vocabulary of everyday life in a written and spoken form. Understanding of general scientific terminology (professional language).  Czech Lower Intermediate   | Z  | expres   | ssions<br>2  |
| 2046125   | mon European Framework of Reference Level A1 Aim: Basic vocabulary of everyday life in a written and spoken form. Understanding of general scientific terminology (professional language).  Czech Lower Intermediate g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them.   | Z  | expres   | ssions<br>2  |
| 2046125<br>Aim: Understanding<br>2046126  | mon European Framework of Reference Level A1 Aim: Basic vocabulary of everyday life in a written and spoken form. Understanding of general scientific terminology (professional language).  Czech Lower Intermediate g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech Lower Intermediate   | Z<br>Writing in a simple   | expres<br>way a  | 2<br>about   |
| 2046125<br>Aim: Understanding<br>2046126  | mon European Framework of Reference Level A1 Aim: Basic vocabulary of everyday life in a written and spoken form. Understanding of general scientific terminology (professional language).  Czech Lower Intermediate g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech Lower Intermediate g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them.   | Z<br>Writing in a simple   | expres<br>way a  | 2<br>about   |
| 2046125 Aim: Understanding 2046126 Aim: Understanding   | Imon European Framework of Reference Level A1 Aim: Basic vocabulary of everyday life in a written and spoken form. Understanding of general scientific terminology (professional language).  Czech Lower Intermediate  g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech Lower Intermediate  g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  | Z Writing in a simple Z Writing in a simple  | e way a  | 2<br>about<br>2<br>about   |
| 2046125 Aim: Understanding 2046126 Aim: Understanding 2046127   | Imon European Framework of Reference Level A1 Aim: Basic vocabulary of everyday life in a written and spoken form. Understanding of general scientific terminology (professional language).  Czech Lower Intermediate  g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech Lower Intermediate  g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech - Upper Intermediate  | Z Writing in a simple Z Writing in a simple  | exprese way a  | 2<br>about<br>2<br>about<br>2  |
| 2046125 Aim: Understanding 2046126 Aim: Understanding 2046127   | contact the second state of the second states and speech about familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech Lower Intermediate  g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech Lower Intermediate  g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech - Upper Intermediate  and speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ability   | Z Writing in a simple Z Writing in a simple  | exprese way a  | 2<br>about<br>2<br>about<br>2  |
| 2046125 Aim: Understanding 2046126 Aim: Understanding 2046127 Understanding sta   | contact the second seco | Z Writing in a simple Z Writing in a simple Z to describe experi   | exprese way a  | 2 about 2 about 2 about 2 and  |
| 2046125 Aim: Understanding 2046126 Aim: Understanding 2046127 Understanding sta   | czech Lower Intermediate g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech Lower Intermediate g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech Lower Intermediate g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech - Upper Intermediate andard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ability events, briefly explain one's opinions and plans. Reading and understanding general and technical texts.  Czech - Upper Intermediate  | Z Writing in a simple Z Writing in a simple Z to describe experi   | exprese way a  | 2 about 2 about 2 and 2  |
| 2046125 Aim: Understanding 2046126 Aim: Understanding 2046127 Understanding sta 2046128 Mapped to the Com   | Czech Lower Intermediate g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech Lower Intermediate g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech Lower Intermediate g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech - Upper Intermediate andard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ability events, briefly explain one's opinions and plans. Reading and understanding general and technical texts.  Czech - Upper Intermediate amon European Framework of Reference Level A2-B1. The aim is to extend language skills taking into consideration professional Cz   | Z Writing in a simple Z Writing in a simple Z to describe experi   | exprese way a ences  | 2 about 2 and 2 sional   |
| 2046125 Aim: Understanding 2046126 Aim: Understanding 2046127 Understanding sta 2046128 Mapped to the Com   | Czech Lower Intermediate g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech Lower Intermediate g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech Lower Intermediate g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech - Upper Intermediate andard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ability events, briefly explain one's opinions and plans. Reading and understanding general and technical texts.  Czech - Upper Intermediate amon European Framework of Reference Level A2-B1. The aim is to extend language skills taking into consideration professional Czprehension of standard Czech speech and conversation about topics of everyday life - at school, at work, during free time, on intermediate   | Z Writing in a simple Z Writing in a simple Z to describe experi   | exprese way a ences  | 2 about 2 and 2 sional   |
| 2046125 Aim: Understanding 2046126 Aim: Understanding 2046127 Understanding sta 2046128 Mapped to the Com   | Czech Lower Intermediate g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech Lower Intermediate g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech Lower Intermediate g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech - Upper Intermediate andard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ability events, briefly explain one's opinions and plans. Reading and understanding general and technical texts.  Czech - Upper Intermediate amon European Framework of Reference Level A2-B1. The aim is to extend language skills taking into consideration professional Cz   | Z Writing in a simple Z Writing in a simple Z to describe experi   | exprese way a ences  | 2 about 2 and 2 sional   |
| 2046125 Aim: Understanding 2046126 Aim: Understanding 2046127 Understanding sta 2046128 Mapped to the Com   | Czech Lower Intermediate g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech Lower Intermediate g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech Lower Intermediate g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech - Upper Intermediate andard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ability events, briefly explain one's opinions and plans. Reading and understanding general and technical texts.  Czech - Upper Intermediate amon European Framework of Reference Level A2-B1. The aim is to extend language skills taking into consideration professional Czprehension of standard Czech speech and conversation about topics of everyday life - at school, at work, during free time, on intermediate   | Z Writing in a simple Z Writing in a simple Z to describe experi   | exprese way a ences professidening   | 2 about 2 and 2 sional   |
| 2046125 Aim: Understanding 2046126 Aim: Understanding 2046127 Understanding sta  2046128 Mapped to the Comterminology. Com 2046135  | Czech Lower Intermediate g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech Lower Intermediate g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech Lower Intermediate g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech - Upper Intermediate andard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ability events, briefly explain one so opinions and plans. Reading and understanding general and technical texts.  Czech - Upper Intermediate  Tzech - Upper Intermediate  Topical Transmework of Reference Level A2-B1. The aim is to extend language skills taking into consideration professional Cz prehension of standard Czech speech and conversation about topics of everyday life - at school, at work, during free time, on intermediate knowledge technical language.  | Z Writing in a simple Z Writing in a simple Z to describe experi Z ech and common pediate level. Broad   | exprese way a ences  | 2 about 2 about 2 and 2 sional the   |
| 2046125 Aim: Understanding 2046126 Aim: Understanding 2046127 Understanding sta 2046128 Mapped to the Com terminology. Com 2046135 Basic voca   | Czech Lower Intermediate g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech Lower Intermediate g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech Lower Intermediate g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech - Upper Intermediate andard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ability events, briefly explain one's opinions and plans. Reading and understanding general and technical texts.  Czech - Upper Intermediate  Topical Transport of Reference Level A2-B1. The aim is to extend language skills taking into consideration professional Cz prehension of standard Czech speech and conversation about topics of everyday life - at school, at work, during free time, on intermediate in the standard Czech speech and conversation about topics of everyday life - at school, at work, during free time, on intermediate in the standard Czech speech and conversation about topics of everyday life - at school, at work, during free time, on intermediate in the standard Czech speech and conversation about topics of everyday life - at school, at work, during free time, on intermediate in the standard Czech speech and conversation about topics of everyday life in a spoken and written form. Understanding and use of basic expressions of general scientific terminology (p   | Z Writing in a simple Z Writing in a simple Z to describe experi Z ech and common pediate level. Broad   | expression ences   | 2 about 2 about 2 and 2 sional the   |
| 2046125 Aim: Understanding 2046126 Aim: Understanding 2046127 Understanding sta 2046128 Mapped to the Com terminology. Com 2046135 Basic voca 2046136   | Czech Lower Intermediate g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech Lower Intermediate g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech Lower Intermediate g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech - Upper Intermediate andard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ability events, briefly explain one's opinions and plans. Reading and understanding general and technical texts.  Czech - Upper Intermediate amon European Framework of Reference Level A2-B1. The aim is to extend language skills taking into consideration professional Cz prehension of standard Czech speech and conversation about topics of everyday life - at school, at work, during free time, on interm knowledge technical language.  Russian - Beginners  bulary of everyday life in a spoken and written form. Understanding and use of basic expressions of general scientific terminology (p  | Z Writing in a simple Z Writing in a simple Z to describe experi Z each and common pediate level. Broad  | expression and a second | 2 about 2 about 2 and 2 sional the 2   |
| 2046125 Aim: Understanding 2046126 Aim: Understanding 2046127 Understanding sta 2046128 Mapped to the Com terminology. Com 2046135 Basic voca 2046136   | czech Lower Intermediate g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech Lower Intermediate g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech Lower Intermediate g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech - Upper Intermediate andard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ability events, briefly explain one's opinions and plans. Reading and understanding general and technical texts.  Czech - Upper Intermediate amon European Framework of Reference Level A2-B1. The aim is to extend language skills taking into consideration professional Cz prehension of standard Czech speech and conversation about topics of everyday life - at school, at work, during free time, on interm knowledge technical language.  Russian - Beginners bulary of everyday life in a spoken and written form. Understanding and use of basic expressions of general scientific terminology (p   | Z Writing in a simple Z Writing in a simple Z to describe experi Z each and common pediate level. Broad  | expression and a second | 2 about 2 about 2 and 2 sional the 2   |
| 2046125 Aim: Understanding 2046126 Aim: Understanding 2046127 Understanding sta 2046128 Mapped to the Com terminology. Com 2046135 Basic vocal 2046136 Mapped to the leve   | Example of Reference Level A1 Aim: Basic vocabulary of everyday life in a written and spoken form. Understanding of general scientific terminology (professional language).  Czech Lower Intermediate  g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech Lower Intermediate  g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech - Upper Intermediate  andard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ability events, briefly explain one's opinions and plans. Reading and understanding general and technical texts.  Czech - Upper Intermediate  Czech - Upper Intermediate  Intermediat | Z Writing in a simple Z Writing in a simple Z to describe experi Z ech and common pediate level. Broad   | expresses express  | 2 about 2 about 2 and 2 sional the 2 sions   |
| 2046125 Aim: Understanding 2046126 Aim: Understanding 2046127 Understanding sta 2046128 Mapped to the Comterminology. Com 2046135 Basic vocal 2046136 Mapped to the leve  | Czech Lower Intermediate g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech Lower Intermediate g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech Lower Intermediate g clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about them. familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  Czech - Upper Intermediate andard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ability events, briefly explain one's opinions and plans. Reading and understanding general and technical texts.  Czech - Upper Intermediate  mon European Framework of Reference Level A2-B1. The aim is to extend language skills taking into consideration professional Cz prehension of standard Czech speech and conversation about topics of everyday life - at school, at work, during free time, on interm knowledge technical language.  Russian - Beginners  bulary of everyday life in a spoken and written form. Understanding and use of basic expressions of general scientific terminology (professional language)  Russian - Beginners  et of Common European Framework of Reference: A1 Basic vocabulary of everyday life in a spoken and written form. Understanding of general scientific terminology (professional language)  Russian - Lower Intermediate Course   | Z Writing in a simple Z Writing in a simple Z to describe experi Z ech and common pediate level. Broad   | expression expression and the second express | 2 about 2 about 2 and 2 sional the 2 2 sions   |
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| 2046142<br>Manned to the le | Russian - Advanced evel of Common European Framework of reference: B1 - B2 Comprehension of spoken language as well as lectures in Russian on to   | Z                     | 2<br>student |
|-----------------------------|--|-----------------------|--------------|
|                             | h native speakers, participation in discussions. Expressing opinions. Written skills. Ability to write an essay or a report. Reading and u<br>currant issues and popular scientific and technical articles.  | •                     |              |
| 2046155                     | English Conversation   | Z                     | 2            |
|                             | Improving communicative skills in speaking on general topics and general technical topics.   |                       |              |
| 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   | Z                     | 2            |
| 2046166                     | Preparation for presenting technical topics in Spanish, possibly in cooperation with specialized departments.  Presentations in Czech  | Z                     | 2            |
| 2040100                     | Preparing students to give presentations in English on technical topics, with a possible co-operation with specialized departm   |                       |              |
| 2121023                     | Thermodynamics   | Z,ZK                  | 5            |
|                             | th a basic engineering approach to classical thermodynamics, heat transfer and compressible flow through nozzles and diffusers. Bas<br>y are applied mostly to systems behaving as ideal gases or typical vapours. Basic notions associated with ideal mixtures are studied with a |                       | -            |
|                             | ers fundamentals of conduction, convection and radiation. Heat exchangers are treated as an engineering application. Exercises and problems and experimental technique.  |                       |              |
| 2121500                     | Fluid Dynamics   | Z,ZK                  | 5            |
|                             | in fluid dynamics deals with fundamental laws of hydrostatics and hydrodynamics and their application on the basic problems, as 10   |                       |              |
| pressure losses             | , simplified solution of unsteady flow. Basic information on more complicated problems (laminar and turbulent flow, boundary layer th<br>introduced as well.   | eory, flow sepparatr  | rion) are    |
| 212A023                     | Thermodynamics A   | ZK                    | 2            |
|                             | th a basic engineering approach to classical thermodynamics, heat transfer and compressible flow through nozzles and diffusers. Bas<br>y are applied mostly to systems behaving as ideal gases or typical vapours. Basic notions associated with ideal mixtures are studied with a |                       | -            |
| -                           | ers fundamentals of conduction, convection and radiation. Heat exchangers are treated as an engineering application. Exercises and   |                       |              |
| 212A500                     | problems and experimental technique Fluid Dynamics A   | ZK                    | 3            |
|                             | in fluid dynamics deals with fundamental laws of hydrostatics and hydrodynamics and their application on the basic problems, as 1  | 1                     | _            |
| pressure losses             | , simplified solution of unsteady flow. Basic information on more complicated problems (laminar and turbulent flow, boundary layer th introduced as well.  | eory, flow sepparatr  | rion) are    |
| 2131002                     | Engineering Design II  | Z,ZK                  | 4            |
|                             | PS (Geometrical Products Specification). Students will get critical knowledge about ISO system of limits and fits, tolerancing, surface<br>ps, tolerancing of angles and cones, tolerancing of threads. Integral part of course is a project where students apply and practice the | . •                   |              |
| 2131005                     | History of Technology  | ZK                    | 3            |
|                             | human knowledge in the domain of science and technology in the retrospective of the developement of our civilization. Emphasis is  | -                     |              |
| technology with 2131026     | special attention to the contribution of mining, iron metallurgy, power engineering, transportation and of the machine industry in the r  Machine Elements and Mechanisms II   | narrower sense of the | ne word.     |
|                             | design calculations and aplication of axles and shafts, sliding and rolling bearings, shaft connections, elements of crank mechanism, and fittings.  | 1                     |              |
| 2131512                     | Machine Elements and Mechanisms I.   | Z,ZK                  | 6            |
|                             | lements (screwed, clamped, splined, welded, riveted, soldered and adhesive joints; joints with use of feathers, pins, tenons, cotters, ke  |                       |              |
|                             | on, gear drives). Seminars are devoted to practical individual solution of simple design projects - tasks with motion screws, preloaded<br>Id key joints between shafts and hubs and tasks with welded and riveted joints. Sketching of machine elements and their simple asser    | =                     | -            |
| р                           | seminar work.  |                       |              |
| 2132001                     | Engineering Design I.  | KZ                    | 2            |
| 2132503                     | Basic of technical representation, dimensioning and tolerancing  Project   | KZ                    | 2            |
|                             | nester global project of mechanical drive of conveyor composed of electric motor, elastic shaft coupling (respectively V-belt drive), ge   | 1                     |              |
|                             | d compensating double-row toothed shaft coupling (respectively roller chain drive). Second, alternative arrangement of projected mech  |                       |              |
|                             | and additional mechanical drives by means of only one single-stage warm gearbox Elaboration of 4 additional reports analysing prod<br>Chine element (gearbox shaft or gear). Besides project of mechanical drive must be elaborated design project of crank mechanism a            |                       | -            |
| 2422042                     | single-cylinder piston engine.   | 7                     |              |
| 2133013                     | Engineering Design III.  Design of assembly unit (draft drawing, detail drawing, assembly drawing, technical report)   | Z                     | 2            |
| 2133014                     | Engineering Design IV.   | Z                     | 2            |
| 2133025                     | Design   | Z                     | 4            |
| Design<br>2133091           | , design calculations and their aplications in case of geared transmissions, axles and shafts, sliding and rolling bearings, shaft coupl<br>Presentation of Project  | ings and clutches.    | 4            |
| 2133091                     | Electric Circuits and Electronics  | Z,ZK                  | 4            |
|                             | neory of electrical circuits, analysis special types of electrical circuits as DC and AC. Transient states in circuits with accumulators of electrical circuits as DC and AC.  |                       |              |
| Introduction into           | electronics. Principle and typical parameters of basic semiconductor components. Application in electronic circuits (rectifier, stabilize amplifier). Analogue and digital circuits. Principle of analogue and digital signal processing. Logical circuits, converters, micropro   | -                     | erational    |
|                             | . ,  |                       |              |

| -  | Electrical machines and drives   | Z,ZK   | 4   |
|--|--|--|---|
| ·  | ן<br>power and energy. Calculation, measurement, power factor. Magnetic circuit, materials, hysteresis loop. Electromagnet. Transfo  |  | 1   |
| 3-phase transformer, op  | erating conditions, rated (scheduled) values. Induction machine, principle, construction, operating conditions. Starting, speed-to   |  |   |
|  | nines. DC-machines, principle, parameters, operating conditions, construction, starting, speed control, speed-torque characteris  Low-voltage distribution system.   |  | -   |
| 2144062  | Technical Indonesian - Course II.  | Z,ZK   | 3   |
|  | Basic of Indonesian Language for Student Exchange Program to Indonesia   |  | _   |
| 2146060  | Indonesian Language Course for Exchange  Basic of Indonesian Language for Student Exchange Program to Indonesia  | Z  | 2   |
| 2146061  | Technical Indonesian - Course I.   | Z  | 2   |
|  | Second part of Indonesian Language for Student Exchange Program to Indonesia   |  |   |
| 2151002  | Nuclear Power Principles   | Z,ZK   | 5   |
| •  | nuclear energy. Development and heat removal from core. Basic materials for nuclear reactors. Basic types of nuclear reactors  |  |   |
|  | s. Fuel cycle. Reactor radiation, detection and quantification, determination of radiation doses. Problems of nuclear safety and   |  | 1   |
| 2151090  | Industry power and heating plant   | Z,ZK   | 5   |
| 2151117  | Design of Power Facilities   | Z,ZK   | 5   |
| 2151118  | Distributed Energy   | Z,ZK   | 5   |
| 2151158  | Principles of Refrigerating Technology and Heat Pumps  | Z,ZK   | 5   |
| 2151165  | Hydraulic and Pneumatic Machines   | Z,ZK   | 5   |
|  | eles of operation of hydraulic machines. Criterions of hydrodynamical similarity. Hydraulic systems. Differend types of pumps, co  |  | 1   |
|  | s conditions. Theory of compression processes. Constructions, calculation, capacity control of compressors, operation with val   |  | -   |
| •  | ors. Accessories of a compressor stations and plants. Economical and ecological problems of a compressed air production and  | -  | 3 3   |
| 2151554  | Thermal Turbines   | Z,ZK   | 5   |
| 2151559  | Heat Exchangers and Boilers  | Z,ZK   | 5   |
| 2151702  | Renewable Energy Sources   | Z,ZK   | 5   |
| 2152028  | **   | KZ   |   |
|  | Energy Audit and Legislation   |  | 5   |
| 2152091  | Deparmental Project  | KZ   | 2   |
| 2153005  | Fundamentals of Energy Conversions   | Z  | 1   |
| 2153006  | Technology of Air Protection in Power Engineering  | Z  | 2   |
| 2153091  | Presentation of Project  | Z  | 4   |
| 2153707  | Project I.   | Z  | 5   |
| 2153985  | Bachelor Thesis  | Z  | 5   |
| 2162091  | Project  | KZ   | 2   |
| ı  | Student will be informed about basics of environmental engineering and creation of thermal comfort.  |  | 1   |
|  |  |  |   |
| 2163091  | Project Presentation  Processing and presentation of engaged theme   | Z  | 4   |
| <u>'</u>   | Processing and presentation of engaged theme   |  |   |
| 2181026  | Processing and presentation of engaged theme  Momentum, Mass and Heat Transfer   | Z,ZK   | 5   |
| 2181026   Fundamentals of transpo  | Processing and presentation of engaged theme  Momentum, Mass and Heat Transfer  rt phenomena balances in homogeneous fluids. Navier-Stokes equations. Momentum transport in turbulent flows. Mechanical clous systems. Conduction heat transfer. Forced and natural convection heat transfer. Heat transfer with phase changes and there   | Z,ZK<br>energy equation.   | 5<br>Residence  |
| 2181026 Fundamentals of transpo  | Processing and presentation of engaged theme  Momentum, Mass and Heat Transfer  rt phenomena balances in homogeneous fluids. Navier-Stokes equations. Momentum transport in turbulent flows. Mechanical clous systems. Conduction heat transfer. Forced and natural convection heat transfer. Heat transfer with phase changes and therr systems. Mass transfer by molecular diffusion, convection, with chemical reactions and interphase mass transfer.  | Z,ZK<br>energy equation.<br>mal radiation. Mu  | 5<br>Residence  |
| 2181026 Fundamentals of transpo me distributions in continu  | Processing and presentation of engaged theme  Momentum, Mass and Heat Transfer  It phenomena balances in homogeneous fluids. Navier-Stokes equations. Momentum transport in turbulent flows. Mechanical clous systems. Conduction heat transfer. Forced and natural convection heat transfer. Heat transfer with phase changes and there systems. Mass transfer by molecular diffusion, convection, with chemical reactions and interphase mass transfer.  Hydromechanical Equipment   | Z,ZK<br>energy equation.<br>mal radiation. Mu<br>Z,ZK  | 5<br>Residence<br>Iticompone  |
| 2181026   Fundamentals of transpo me distributions in continue  2181502   Design, principles and bas   | Processing and presentation of engaged theme  Momentum, Mass and Heat Transfer  rt phenomena balances in homogeneous fluids. Navier-Stokes equations. Momentum transport in turbulent flows. Mechanical clous systems. Conduction heat transfer. Forced and natural convection heat transfer. Heat transfer with phase changes and therr systems. Mass transfer by molecular diffusion, convection, with chemical reactions and interphase mass transfer.  | Z,ZK energy equation. mal radiation. Mu Z,ZK clones, fluidized   | 5<br>Residence<br>Iticompone  |
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| 2181026   Fundamentals of transpo me distributions in continuation and provided in the provide | Processing and presentation of engaged theme  Momentum, Mass and Heat Transfer  It phenomena balances in homogeneous fluids. Navier-Stokes equations. Momentum transport in turbulent flows. Mechanical of tous systems. Conduction heat transfer. Forced and natural convection heat transfer. Heat transfer with phase changes and there systems. Mass transfer by molecular diffusion, convection, with chemical reactions and interphase mass transfer.  Hydromechanical Equipment  ic calculations of following equipment: pipes and pipe networks, packed and bubble columns, filters, settlers, centrifuges and cylipment, silos and conveyors, crushers and mills, granulators, extruders, injection and blow moulding machines, rolls and caler  Diffusion separation equipment  r diffusion separation processes are giving a basic knowledge of processes and equipments where gas or liquid mixture is bee libriums or on the basis of mass transfer mechanisms. They are used for concentrating of products from dilute solutions or in turbulent transfer equipments  Heat transfer equipments  namics and conductive and convective heat transfer. Enthalpy balancing. Technical thermodynamics and basic thermodynamics  | Z,ZK energy equation. mal radiation. Mu  Z,ZK clones, fluidized nders.  Z,ZK en separated due urn for purification  Z,ZK   | 5 Residence Iticompone 5 beds, mixir 5 to principa of diluted   |
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| 2181026 Fundamentals of transpo me distributions in continuation and conti | Processing and presentation of engaged theme  Momentum, Mass and Heat Transfer  It phenomena balances in homogeneous fluids. Navier-Stokes equations. Momentum transport in turbulent flows. Mechanical clous systems. Conduction heat transfer. Forced and natural convection heat transfer. Heat transfer with phase changes and their systems. Mass transfer by molecular diffusion, convection, with chemical reactions and interphase mass transfer.  Hydromechanical Equipment  Ic calculations of following equipment: pipes and pipe networks, packed and bubble columns, filters, settlers, centrifuges and cylipment, silos and conveyors, crushers and mills, granulators, extruders, injection and blow moulding machines, rolls and caler  Diffusion separation equipment  It diffusion separation processes are giving a basic knowledge of processes and equipments where gas or liquid mixture is bee libriums or on the basis of mass transfer mechanisms. They are used for concentrating of products from dilute solutions or in the gasses or liquid solutions.  Heat transfer equipments  Inamics and conductive and convective heat transfer. Enthalpy balancing. Technical thermodynamics and basic thermodynamics and conductive and convective heat transfer. Enthalpy balancing. Technical thermodynamics and dryers.  Chemistry  the point of view of mechanical and process engineering. Physical chemistry forms 2/3 of the course (structure and properties ical reactions, reaction engineering), the remaining 1/3 is devoted to organic chemistry (hydrocarbons, polymers) and biochem oriented upon the material properties measurement.   | Z,ZK energy equation. mal radiation. Mu Z,ZK clones, fluidized nders. Z,ZK en separated due urn for purificatio Z,ZK cycles. Functiona KZ of matter, thermonistry. Laboratory                                    | 5 Residence Iticompone 5 beds, mixir 5 to principa n of diluted 5 I descriptio 3 odynamics, practice is                       |
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| 2181026 Fundamentals of transpoor ime distributions in continuation of transpoor in continuation of transpoor implementation of the transpoor implementation of transpoor | Processing and presentation of engaged theme  Momentum, Mass and Heat Transfer  It phenomena balances in homogeneous fluids. Navier-Stokes equations. Momentum transport in turbulent flows. Mechanical clous systems. Conduction heat transfer. Forced and natural convection heat transfer. Heat transfer with phase changes and therr systems. Mass transfer by molecular diffusion, convection, with chemical reactions and interphase mass transfer.  Hydromechanical Equipment  ic calculations of following equipment: pipes and pipe networks, packed and bubble columns, filters, settlers, centrifuges and cyuipment, silos and conveyors, crushers and mills, granulators, extruders, injection and blow moulding machines, rolls and caler  Diffusion separation equipment  r diffusion separation processes are giving a basic knowledge of processes and equipments where gas or liquid mixture is bee libriums or on the basis of mass transfer mechanisms. They are used for concentrating of products from dilute solutions or in to gasses or liquid solutions.  Heat transfer equipments  namics and conductive and convective heat transfer. Enthalpy balancing. Technical thermodynamics and basic thermodynamics and conductive and convective heat transfer. Enthalpy balancing. Technical thermodynamics and dryers.  Chemistry  the point of view of mechanical and process engineering. Physical chemistry forms 2/3 of the course (structure and properties ical reactions, reaction engineering), the remaining 1/3 is devoted to organic chemistry (hydrocarbons, polymers) and biochem oriented upon the material properties measurement.  Project  Absolvent se seznámí se základy oboru Procesní technika.  Project Presentation  Preparation and presentation of a given project theme.   | Z,ZK energy equation. Mu Z,ZK clones, fluidized nders. Z,ZK en separated due urn for purification Z,ZK cycles. Functiona KZ of matter, thermonistry. Laboratory KZ Z   | 5 Residence Iticomponed 5 beds, mixin 5 to principa on of diluted 3 odynamics, practice is 2                                  |
| 2181026 Fundamentals of transpoor me distributions in continuation of transpoor principles and basequilibuted and basequil | Processing and presentation of engaged theme  Momentum, Mass and Heat Transfer  It phenomena balances in homogeneous fluids. Navier-Stokes equations. Momentum transport in turbulent flows. Mechanical cous systems. Conduction heat transfer. Forced and natural convection heat transfer. Heat transfer with phase changes and therr systems. Mass transfer by molecular diffusion, convection, with chemical reactions and interphase mass transfer.  Hydromechanical Equipment  ic calculations of following equipment: pipes and pipe networks, packed and bubble columns, filters, settlers, centrifuges and cylipment, silos and conveyors, crushers and mills, granulators, extruders, injection and blow moulding machines, rolls and caler  Diffusion separation equipment  r diffusion separation processes are giving a basic knowledge of processes and equipments where gas or liquid mixture is bee libriums or on the basis of mass transfer mechanisms. They are used for concentrating of products from dilute solutions or in the gasses or liquid solutions.  Heat transfer equipments  namics and conductive and convective heat transfer. Enthalpy balancing. Technical thermodynamics and basic thermodynamics and basic thermodynamics and conductive and convective heat transfer. Enthalpy balancing. Technical thermodynamics and dryers.  Chemistry  the point of view of mechanical and process engineering. Physical chemistry forms 2/3 of the course (structure and properties ical reactions, reaction engineering), the remaining 1/3 is devoted to organic chemistry (hydrocarbons, polymers) and biochem oriented upon the material properties measurement.  Project  Absolvent se seznámí se základy oboru Procesní technika.  Project Presentation  Preparation and presentation of a given project theme.  | Z,ZK energy equation. mal radiation. Mu  Z,ZK clones, fluidized nders.  Z,ZK en separated due urn for purificatio  Z,ZK cycles. Functiona  KZ of matter, thermonistry. Laboratory                                | 5 Residence Iticompone 5 beds, mixir 5 to principa on of diluted 5 I descriptio 3 odynamics, practice is                      |
| 2181026 Fundamentals of transpoime distributions in continual cont | Processing and presentation of engaged theme  Momentum, Mass and Heat Transfer  It phenomena balances in homogeneous fluids. Navier-Stokes equations. Momentum transport in turbulent flows. Mechanical clous systems. Conduction heat transfer. Forced and natural convection heat transfer with phase changes and therr systems. Mass transfer by molecular diffusion, convection, with chemical reactions and interphase mass transfer.  Hydromechanical Equipment  ic calculations of following equipment: pipes and pipe networks, packed and bubble columns, filters, settlers, centrifuges and cy sipment, silos and conveyors, crushers and mills, granulators, extruders, injection and blow moulding machines, rolls and caler Diffusion separation equipment  I diffusion separation processes are giving a basic knowledge of processes and equipments where gas or liquid mixture is bee libriums or on the basis of mass transfer mechanisms. They are used for concentrating of products from dilute solutions or in the gasses or liquid solutions.  Heat transfer equipments  namics and conductive and convective heat transfer. Enthalpy balancing. Technical thermodynamics and basic thermodynamics and conductive and convective heat transfer. Enthalpy balancing. Technical thermodynamics and basic thermodynamics of mechanical design, thermal and hydraulic design of a heat exchangers, evaporators and dryers.  Chemistry  the point of view of mechanical and process engineering. Physical chemistry forms 2/3 of the course (structure and properties ical reactions, reaction engineering), the remaining 1/3 is devoted to organic chemistry (hydrocarbons, polymers) and biochem oriented upon the material properties measurement.  Project  Absolvent se seznámí se základy oboru Procesní technika.  Project Presentation  Preparation and presentation of a given project theme.  Project I.  Project, dimensioning and designing solution of basic elements for process technology.                               | Z,ZK energy equation. mal radiation. Mu  Z,ZK clones, fluidized nders.  Z,ZK en separated due urn for purification  Z,ZK cycles. Functiona  KZ of matter, thermonistry. Laboratory  KZ  Z                        | 5 Residence Iticompone 5 beds, mixir 5 to principa on of diluted 3 odynamics, practice is 2                                   |
| 2181026 Fundamentals of transpoime distributions in continual cont | Processing and presentation of engaged theme  Momentum, Mass and Heat Transfer  It phenomena balances in homogeneous fluids. Navier-Stokes equations. Momentum transport in turbulent flows. Mechanical rous systems. Conduction heat transfer. Forced and natural convection heat transfer. Heat transfer with phase changes and them systems. Mass transfer by molecular diffusion, convection, with chemical reactions and interphase mass transfer.  Hydromechanical Equipment  Ic calculations of following equipment: pipes and pipe networks, packed and bubble columns, filters, settlers, centrifuges and cy appropriate and conveyors, crushers and mills, granulators, extruders, injection and blow moulding machines, rolls and caler  Diffusion separation equipment  It diffusion separation processes are giving a basic knowledge of processes and equipments where gas or liquid mixture is bee libriums or on the basis of mass transfer mechanisms. They are used for concentrating of products from dilute solutions or in the gasses or liquid solutions.  Heat transfer equipments  Inamics and conductive and convective heat transfer. Enthalpy balancing. Technical thermodynamics and basic thermodynamic of mechanical design, thermal and hydraulic design of a heat exchangers, evaporators and dryers.  Chemistry  The point of view of mechanical and process engineering. Physical chemistry forms 2/3 of the course (structure and properties ical reactions, reaction engineering), the remaining 1/3 is devoted to organic chemistry (hydrocarbons, polymers) and biochem oriented upon the material properties measurement.  Project  Absolvent se seznámí se základy oboru Procesní technika.  Project Presentation  Preparation and presentation of a given project theme.  Project I.  Project, dimensioning and designing solution of basic elements for process technology.  Bachelor Thesis   | Z,ZK energy equation. mal radiation. Mu  Z,ZK clones, fluidized nders.  Z,ZK en separated due urn for purification  Z,ZK cycles. Functiona  KZ of matter, thermonistry. Laboratory  KZ  Z                        | 5 Residence Iticomponer 5 beds, mixir 5 to principa on of diluted 3 odynamics, practice is 2                                  |
| 2181026 Fundamentals of transpoime distributions in continual cont | Processing and presentation of engaged theme  Momentum, Mass and Heat Transfer  It phenomena balances in homogeneous fluids. Navier-Stokes equations. Momentum transport in turbulent flows. Mechanical toous systems. Conduction heat transfer. Forced and natural convection, with chemical reactions and interphase mass transfer.  Hydromechanical Equipment Ic calculations of following equipment: pipes and pipe networks, packed and bubble columns, filters, settlers, centrifuges and cylipment, silos and conveyors, crushers and mills, granulators, extruders, injection and blow moulding machines, rolls and caler  Diffusion separation equipment It diffusion separation processes are giving a basic knowledge of processes and equipments where gas or liquid mixture is bee libriums or on the basis of mass transfer mechanisms. They are used for concentrating of products from dilute solutions or in the gasses or liquid solutions.  Heat transfer equipments  namics and conductive and convective heat transfer. Enthalpy balancing. Technical thermodynamics and basic thermodynamics and dryers.  Chemistry  he point of view of mechanical and process engineering. Physical chemistry forms 2/3 of the course (structure and properties ical reactions, reaction engineering), the remaining 1/3 is devoted to organic chemistry (hydrocarbons, polymers) and biochem oriented upon the material properties measurement.  Project  Absolvent se seznámí se základy oboru Procesní technika.  Project I.  Project I.  Project, dimensioning and designing solution of basic elements for process technology.  Bachelor Thesis  Ividual work. This work checks ability of logical independent technical thinking and treatment with technical materials. There is  | Z,ZK energy equation. mal radiation. Mu  Z,ZK clones, fluidized nders.  Z,ZK en separated due urn for purification  Z,ZK cycles. Functiona  KZ of matter, thermonistry. Laboratory  KZ  Z                        | 5 Residence Iticomponer 5 beds, mixin 5 to principa on of diluted 5 I description 3 odynamics, practice is 2 4 5              |
| 2181026 Fundamentals of transpoime distributions in continuation of transpoime distributions in continuation of transpoime distributions in continuation of transposition of transposition of physical chemical equivalent for the state of the | Processing and presentation of engaged theme  Momentum, Mass and Heat Transfer  In phenomena balances in homogeneous fluids. Navier-Stokes equations. Momentum transport in turbulent flows. Mechanical to us systems. Conduction heat transfer. Forced and natural convection heat transfer with phase changes and them systems. Mass transfer by molecular diffusion, convection, with chemical reactions and interphase mass transfer.  Hydromechanical Equipment  ic calculations of following equipment: pipes and pipe networks, packed and bubble columns, filters, settlers, centrifuges and cy pipment, silos and conveyors, crushers and mills, granulators, extruders, injection and blow moulding machines, rolls and caler  Diffusion separation equipment  rdiffusion separation processes are giving a basic knowledge of processes and equipments where gas or liquid mixture is bee libriums or on the basis of mass transfer mechanisms. They are used for concentrating of products from dilute solutions or in to gasses or liquid solutions.  Heat transfer equipments  namics and conductive and convective heat transfer. Enthalpy balancing. Technical thermodynamics and basic thermodynamics and hydraulic design of a heat exchangers, evaporators and dryers.  Chemistry  the point of view of mechanical and process engineering. Physical chemistry forms 2/3 of the course (structure and properties ical reactions, reaction engineering), the remaining 1/3 is devoted to organic chemistry (hydrocarbons, polymers) and biochem oriented upon the material properties measurement.  Project  Absolvent se seznámí se základy oboru Procesní technika.  Project Presentation  Preparation and presentation of a given project theme.  Project I.  Project, dimensioning and designing solution of basic elements for process technology.  Bachelor Thesis  ividual work. This work checks ability of logical independent technical thinking and treatment with technical materials. There is from previous study periods. | Z,ZK energy equation. mal radiation. Mu  Z,ZK clones, fluidized nders.  Z,ZK en separated due urn for purification  Z,ZK cycles. Functiona  KZ of matter, thermonistry. Laboratory  KZ  Z applied acquired       | 5 Residence Iticomponer   |
| 2181026 Fundamentals of transpoorme distributions in continuous distributions distribu | Processing and presentation of engaged theme  Momentum, Mass and Heat Transfer  It phenomena balances in homogeneous fluids. Navier-Stokes equations. Momentum transport in turbulent flows. Mechanical toous systems. Conduction heat transfer. Forced and natural convection, with chemical reactions and interphase mass transfer.  Hydromechanical Equipment Ic calculations of following equipment: pipes and pipe networks, packed and bubble columns, filters, settlers, centrifuges and cylipment, silos and conveyors, crushers and mills, granulators, extruders, injection and blow moulding machines, rolls and caler  Diffusion separation equipment It diffusion separation processes are giving a basic knowledge of processes and equipments where gas or liquid mixture is bee libriums or on the basis of mass transfer mechanisms. They are used for concentrating of products from dilute solutions or in the gasses or liquid solutions.  Heat transfer equipments  namics and conductive and convective heat transfer. Enthalpy balancing. Technical thermodynamics and basic thermodynamics and dryers.  Chemistry  he point of view of mechanical and process engineering. Physical chemistry forms 2/3 of the course (structure and properties ical reactions, reaction engineering), the remaining 1/3 is devoted to organic chemistry (hydrocarbons, polymers) and biochem oriented upon the material properties measurement.  Project  Absolvent se seznámí se základy oboru Procesní technika.  Project I.  Project I.  Project, dimensioning and designing solution of basic elements for process technology.  Bachelor Thesis  Ividual work. This work checks ability of logical independent technical thinking and treatment with technical materials. There is  | Z,ZK energy equation. mal radiation. Mu  Z,ZK clones, fluidized nders.  Z,ZK en separated due urn for purification  Z,ZK cycles. Functiona  KZ of matter, thermonistry. Laboratory  KZ  Z applied acquired  Z,ZK | 5 Residence Iticomponer 5 beds, mixin 5 to principa on of diluted 5 I description 3 odynamics, practice is 2 4 5 to knowledge |

| 2311102              | Mechanics II.   | Z,ZK                                  | 4          |
|----------------------|---|---------------------------------------|------------|
| •                    | nd of rigid bodies. Transformation matrix. Kinematics of concurrent movements. Motion: translation, rotation, general planar motion,  | •                                     |            |
| eneral spatial motio | <ul> <li>n. Composition of mechanisms. Basic planar mechanisms. Analytical methods in kinematics of mechanisms - Trigonometric and vec-<br/>in kinematics. Basic theory of gearing. Transmition mechanisms with geers. Strutting and seezing in mechanisms. Cable mechanisms</li> </ul> | · · · · · · · · · · · · · · · · · · · | cal method |
| 2311108              | Mechanics III.  | Z,ZK                                  | 6          |
| 231A101              | Mechanics I.A   | ZK                                    | 2          |
| 231A102              | Mechanics II.A  | ZK                                    | 2          |
| 2321039              | Materials Science II.   | Z,ZK                                  | 4          |
|                      | tallurgy, iron-carbon alloys and influence of other elements, phase transformations, thermal, combined chemical and thermal and t   |                                       | processin  |
|                      | technical iron-carbon alloys, non-ferrous metals and their alloys, plastics, structural ceramics, composites, selection of mater  | ials.                                 | •          |
| 2322029              | Materials Science I.  | KZ                                    | 3          |
| History and presen   | t state of materials engineering, overview of technical materials, internal structure of metals, crystal lattices and their defects, defo   | rmation, recrystalliz                 | zation and |
| fracture of materi   | als, structure and properties of materials and their testing, fundamentals of thermodynamics, phases and phase transformations, i   | ron-carbon phase o                    | diagram.   |
| 2362091              | Project   | KZ                                    | 2          |
| 2363091              | Project Presentation  | Z                                     | 4          |
| 2371047              | Automatic Control   | Z,ZK                                  | 5          |
|                      | rs are important part of many industrial processes. The goal of this course is to introduce students into basic knowledge of automa   |                                       |            |
| e transfer functions | s, open versus closed loop control, design of controllers and frequency based analysis of control systems. The course also concentra  | ates on logic control                 | and cont   |
| via programmable     | logic controllers. Some seminaries are arranged in laboratories where practical skills and control engineering methods are trained  | Students begin to                     | work with  |
|                      | MATLAB software as a common platform of control engineers.  |                                       |            |
| 2372041              | Computer Support for Study  | KZ                                    | 3          |
| ne course introduce  | es students into creating technical and professional documents on computers or Web and into realizing technical computations with   | the use of compute                    | rs. Studer |
| gain practical       | skills by creating an essay in a text editor, by realizing technical computations with a spreadsheet calculator, and by creating technical  | ical-based WWW p                      | age.       |
| 2372083              | Measurement in Engineering  | KZ                                    | 3          |
| Overview of sensor   | or principles for measurement of non-electrical variables (temperature, position, force, speed, acceleration, torque). Calibration and  | verification of mea                   | surement   |
|                      | instruments.  |                                       |            |
| 2372091              | Project   | KZ                                    | 2          |
|                      | An individual project from the branch of specialisation, which student will study on his/her magister level   |                                       |            |
| 2373091              | Project presentation  | Z                                     | 4          |
| -                    | chelor work presentation. Student should study the presentation software possibilities and proposition of the department. Student s   |                                       |            |
| of actual version of | of his diploma or bachelor work and present it in the face of the other student. The presentation will continue with discussion. Const  | equently, the work s                  | should be  |
|                      | presented as a pdf file on a temporal web page.   |                                       |            |
| 2381054              | Management and Economics of the Enterprise  | Z,ZK                                  | 4          |
| _                    | ed to give students the understanding of economic principles. The economical part of the course is consisted from: explanation of   |                                       |            |
|                      | and income, concept of investment and calculations per product, presentation how to assemble a basic operating budget and exp   |                                       |            |
| n the imancial state | ments. The management introduces the basic managerial functions and their contents, the uses of network analysis in project man<br>of multi-criteria decision, the basics of marketing and strategic management.  | iagement, with the                    | аррисано   |
| 2383001              |   | 7                                     | 2          |
|                      | Fundamentals of Law egal system is a necessary part of professional equipment of each expert with university degree. The aim of this course is to provi   | _                                     | _          |
|                      | egal system is a necessary part of professional equipment of each expert with university degree. The aim of this course is to provi<br>irces of law and system of law (branch of law), using tutorials, lectures, specialised literature and significant legal regulations. It is r     |                                       | •          |
| -                    | s, that will be regularly in touch with, especially during their professional career and to learn how to work with the collection of laws   | · · ·                                 |            |
| •                    | by some practical habits and processes while putting the law on, especially in domain of contracts and other important legal relation   |                                       |            |
|                      | to prepare professional presentations and to understand basic structures between law and engineering  | ·                                     |            |
| 2383008              | Managerial Psychology   | Z                                     | 2          |
| 2383009              | Communication and Dealing with People   | Z                                     | 2          |
|                      | tion represents an irreplaceable phenomenon in human activity, as it is present in practically all of his activities. The same applies  | I .                                   |            |
|                      | the activities of managers. So you can't not communicate - you can only communicate badly, well and excellently.  |                                       | ,          |
| 2383019              | Philosophical Issues Of Individual and Science  | Z                                     | 2          |
| K331068              | Technology I  | Z,ZK                                  | 5          |
|                      | f metals. Treatment. Pouring. Casting solidification. Moulding and core making. Thermal treatment. Plastic deformation. Division of forr  |                                       | _          |
| . , []               | heating-up. Cutting. Cold and hot forming. Welds. Weldability. Weldment testing. Thermal cutting. Brasing. Surface treatment  |                                       | ,          |
| K333038              | Fundamentals of Technology I.   | Z                                     | 3          |
|                      | es in engineering production. Technology of engineering production. Materials in engineering. Concepts of steel and cast iron, tech   | 1                                     |            |
| •                    | ing: modeling devices, molding materials, molding and castings. Foundry alloys. Overview of basic casting technology. Forming tec   |                                       |            |
|                      | ging. Rolling. Production of pipes. Bulk and sheet metal forming. Welding technology. The characteristics of the various types of well  |                                       |            |
|                      | welding and arc welding with coated electrodes. Thermal cutting.  | -                                     |            |
|                      |   |                                       |            |

For updated information see <a href="http://bilakniha.cvut.cz/en/FF.html">http://bilakniha.cvut.cz/en/FF.html</a> Generated: day 2024-05-17, time 09:37.

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Technology II.

Z,ZK

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