# Study plan

# Name of study plan: 09 54 59 00 DSTR 2012 A - prezen ní anglicky

Faculty/Institute/Others:

Department:

Branch of study guaranteed by the department: Welcome page

Garantor of the study branch: Program of study: Welcome page Type of study: unknown full-time

Required credits: 64

Elective courses credits: 115 Sum of credits in the plan: 179

Note on the plan: SP12BSTR--A # t etí pokus

Name of the block: Compulsory courses in the program

Minimal number of credits of the block: 0

The role of the block: P

Code of the group: 12DSA1P-KMEN

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

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

Credits in the group: 0 Note on the group:

Note on the group: 12B\*A1P-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
E182019	Chemistry Jaromír Štancl Jaromír Štancl (Gar.)	KZ	3	2P+1C	*	Р
E372041	Computer Support for Study	KZ	3	1P+1C	*	Р
E011021	Constructive Geometry Ivana Linkeová	Z,ZK	6	3P+2C	Z	Р
E333038	Fundamentals of Technology I.	Z	3	1P+1C	*	Р
E011056	Mathematics I.	Z,ZK	8	4P+4C	Z	Р

### Characteristics of the courses of this group of Study Plan: Code=12DSA1P-KMEN Name=00 2012 D kmenové 1. semestr STR anglicky

E182019	Chemistry	KZ	3
General chemistry	from the point of view of mechanical and process engineering. Physical chemistry forms 2/3 of the course (structure and proper	ties of matter, therm	nodynamics,
phase equilibrium,	chemical reactions, reaction engineering), the remaining 1/3 is devoted to organic chemistry (hydrocarbons, polymers) and bioc	hemistry. Laborator	y practice is
oriented upon the r	material properties measurement.		
E372041	Computer Support for Study	KZ	3
The course introdu	ces students into creating technical and professional documents on computers or Web and into realizing technical computations	with the use of com	outers. Students
gain practical skills	by creating an essay in a text editor, by realizing technical computations with a spreadsheet calculator, and by creating and pre	senting a web page	-
E011021	Constructive Geometry	Z,ZK	6
The subject is focu	sed on geometric objects in the space - curves, surfaces and solids and their properties and mutual relations.		
E333038	Fundamentals of Technology I.	Z	3
The study of manu	facturing processes forms a core subject area for a majority of mechanical enginnering stdents. It contains basic concept of thre	e manufacturing ted	hnologies such
as casting, forming	and welding, including basic terms, methods and materials.		
E011056	Mathematics I.	Z,ZK	8
In the course, great	ter emphasis is placed on the theoretical basis of the concepts discussed and on the derivation of basic relationships and conne	ctions between cor	cepts. Students

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.

Code of the group: 12DSA2P-KMEN

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

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

Credits in the group: 0

Note on the group: 12B\*A2P-KMEN #

Fundamentals of Technology I.

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
E012037	Computer Graphics Nikola Pajerová, Ivana Linkeová Ivana Linkeová (Gar.)	KZ	3	1P+1C	*	Р
E131002	Engineering Design II Martin Dub	Z,ZK	4	2P+3C	2	Р
E333038	Fundamentals of Technology I.	Z	3	1P+1C	*	Р
E322029	Materials Science I. Jakub Horník, Veronika Mazá ová Jakub Horník Jakub Horník (Gar.)	KZ	3	2P+0C+1L	. L	Р
E011062	Mathematics II Stanislav Kra mar	Z,ZK	8	4P+4C	*	Р
E021041	Physics I.	Z,ZK	7	4P+1C	*	Р

Characteristics of the courses of this group of Study Plan: Code=12DSA2P-KMEN Name=00 2012 D kmenové 2. semestr STR anglicky

The study of manufact	uring processes forms a core subject area for a majority of mechanical enginnering stdents. It contains basic concept of three	manufacturing te	chnologies such
as casting, forming an	d welding, including basic terms, methods and materials.		
E012037	Computer Graphics	KZ	3
The subject is focused	on the mathematical theory of the curves and surfaces in computer graphics and their visualisation. The Rhinoceros - NURB	S modelling for W	indows is used
to demonstrate the ge	ometrical properties of the curves and surfaces.		
E131002	Engineering Design II	Z,ZK	4
Theoretical fundamen	als of GPS (Geometrical Product Specification). Students will get critical knowledge about ISO system of limits and fits, toleral	ncing, surface text	ture, geometrical
tolerance, dimensiona	loops, tolerancing of angles and cones, tolerancing of threads. Integral part of course is a project where students apply and p	ractice their know	vledge from

E322029 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.

E011062 Mathematics 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.

E021041 | 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. Electromagnetic field. Laboratories - accuracy of measurements, systematic and random errors, uncertainty of direct and indirect measurements, regression, measurements of 11 various experiments related to the lectures.

Code of the group: 12DSA3P-KMEN

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

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

Credits in the group: 0

Note on the group:

E333038

12B\*A3P-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
E012035	Algorithmization and Programming Petr Svá ek, Marta ertíková, David Trdli ka Marta ertíková Petr Svá ek (Gar.)	KZ	4	1P+2C	*	Р
E133013	Engineering Design III. František Lopot, Jan Hoidekr Jan Hoidekr (Gar.)	Z	2	0P+2C	*	Р
E321039	Materials Science II.  Jakub Horník, Veronika Mazá ová, Jana Sobotová Jakub Horník Jakub  Horník (Gar.)	Z,ZK	4	2P+2L	*	Р
E011009	Mathematics III. Olga Majlingová, Stanislav Kra mar Stanislav Kra mar (Gar.)	Z,ZK	5	2P+2C	*	Р
E311101	Mechanics I.  Pavel Bastl, Václav Bauma, Petr Beneš, Ivo Bukovský, Martin Ne as, Zden k Neusser, Jan Pelikán, Pavel Steinbauer, Zbyn k Šika, Zbyn k Šika Zbyn k Šika (Gar.)	Z,ZK	4	2P+2C	*	Р
E021025	Physics II.	Z,ZK	4	1P+2C	*	Р

Characteristics of the courses of this group of Study Plan: Code=12DSA3P-KMEN Name=00 2012 D kmenové 3. semestr STR anglicky

E012035	Algorithmization and Programming	KZ	4
Programming in MATLA	B and its programming language. MATLAB command line. Elementary commands, variable, assignment and expression. Ma	trices, vectors and	d operations.
Writting M-script. Input	and output. Condition and cycle. Algorithmization of simple problems in MATLAB. Graphical commands. Matrix operations. S	ystems of linear e	quations. Scripts
and functions. Structure	e of program. Variables, expressions, assignment, and input / output commands. switch. For cycle. Arrays and files. Pointers. S	Structures. Algorith	nmization of
simple programs: minin	num, mean, norm, numerical integration, bisection method, Newton method, matrix operations. Direct methods for solution of	systems of linear	equations.
E133013	Engineering Design III.	Z	2
E321039	Materials Science II.	Z,ZK	4
Fundamentals of metal	lurgy, iron-carbon alloys and influence of other elements, phase transformations, thermal, combined chemical and thermal ar	nd thermo-mechar	nical processing,
technical iron-carbon a	lloys, non-ferrous metals and their alloys, plastics, structural ceramics, composites, selection of materials.		
E011009	Mathematics III.	Z,ZK	5
An introductory course	in ordinary differential equation and infinite series.		
E311101	Mechanics I.	Z,ZK	4
Modeling of mechanica	systems. Determination of force. Constraints and equilibrium of a point. Moment and Torque. Body constraints in 2D. Replac	ement and baland	e of general
planar system of forces	. The balance of the body in the plane - numerically. Body constraints in 3D. Replacement and general spatial equilibrium of a	a system of forces	. The balance
of the body in 3D. MBS	- Multi Body Systems. Static determinancy and mobility, composition. Analytical solution of equilibrium for MBS systems. Tru	ss systems. Cente	r of gravity.
Internal forces. The bal	ance of the body and of multibody systems with friction. Mechanical work. Power. Efficiency. Equilibrium position.		
E021025	Physics II.	Z,ZK	4
Faraday's law of electro	magnetic induction. Maxwell's equations, electromagnetic waves. Light, wave optics, geometrical optics. Quantum properties of	electromagnetic w	aves. Interaction
of radiation with matter	Photoelectric effect. Wave-particle mature of matter. Quantum-mechanical description of particle's motion. Hydrogen atom a	and periodic syster	n of elements.
Spectra, x-rays, ;laser.	Band theory of solids, semiconductors. Nucleus, radioactivity, sources of nuclear energy. Laboratories - measurements of 6 e	experiments related	d to the lectures.

Code of the group: 12DSA4P-KMEN

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

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

Credits in the group: 0

Note on the group:

12B\*A4P-KMEN #

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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
E133014	Engineering Design IV. František Lopot, Jan Hoidekr Jan Hoidekr (Gar.)	Z	2	0P+2C+0L	*	Р
E311102	Mechanics II. Pavel Bastl, Václav Bauma, Petr Beneš, Ivo Bukovský, Martin Ne as, Zden k Neusser, Jan Pelikán, Pavel Steinbauer, Zbyn k Šika, Václav Bauma Václav Bauma (Gar.)	Z,ZK	4	2P+2C	*	Р
E011049	Numerical Mathematics Petr Svá ek, Marta ertíková, David Trdli ka, Jan Karel Petr Svá ek Petr Svá ek (Gar.)	Z,ZK	4	2P+2C	*	Р
E331068	Technology I.	Z,ZK	5	2P+2C	*	Р

## Characteristics of the courses of this group of Study Plan: Code=12DSA4P-KMEN Name=00 2012 D kmenové 4. semestr STR anglicky

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E133014	Engineering Design IV.	Z	2					
Information about general principles of a new technical product design, stages of development of a new product, the designer fundamental assignment is to propose a rivalrous product.								
including. Designing of	a dribling jig. A drilling jig is a device by means of which holes on many duplicate parts may be drilled exactly alike.							
E311102	Mechanics II.	Z,ZK	4					
Kinematics of point and	d of rigid bodies. Transformation matrix. Kinematics of concurrent movements. Motion: translation, rotation, general planar motio	n, spherical motic	on, screw motion,					
general spatial motion	$Composition \ of \ mechanisms. \ Basic \ planar \ mechanisms. \ Analytical \ methods \ in \ kinematics \ of \ mechanisms - \ Trigonometric \ and \ methods \ in \ kinematics \ of \ mechanisms - \ Trigonometric \ and \ methods \ in \ kinematics \ of \ mechanisms - \ Trigonometric \ and \ methods \ in \ kinematics \ of \ mechanisms - \ Trigonometric \ and \ methods \ in \ kinematics \ of \ mechanisms - \ Trigonometric \ and \ methods \ in \ kinematics \ of \ mechanisms - \ Trigonometric \ and \ methods \ in \ kinematics \ of \ mechanisms - \ Trigonometric \ and \ methods \ in \ kinematics \ of \ mechanisms - \ Trigonometric \ and \ methods \ in \ kinematics \ of \ mechanisms - \ Trigonometric \ and \ methods \ in \ kinematics \ of \ mechanisms - \ Trigonometric \ and \ methods \ in \ kinematics \ of \ mechanisms - \ Trigonometric \ and \ methods \ in \ kinematics \ of \ mechanisms - \ Trigonometric \ and \ methods \ in \ kinematics \ of \ mechanisms - \ Trigonometric \ of \ of \ mechanisms - \ Trigonometric \ of \ of \ mechanisms - \ Trigonometric \ of \ o$	vector method. Gr	aphical methods					
in kinematics. Basic th	eory of gearing. Transmition mechanisms with geers. Strutting and seezing in mechanisms. Cable mechanisms.							
E011049	Numerical Mathematics	Z,ZK	4					
E331068	Technology I.	Z,ZK	5					
Foundry properties of r	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. Co	old and hot forming. Welds. Weldability. Weldment testing. Thermal cutting. Brazing. Surface treatments.							

Code of the group: 12DSA5P-KMEN

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

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

Credits in the group: 0

Note on the group:

12B\*A5P-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
E141504	Electrical Circuits and Electronics Jan Chyský, Martin Novák Martin Novák Jan Chyský (Gar.)	Z,ZK	4	2P+0C+2L	*	Р

E153005	Fundamentals of Energy Conversions	Z	1	1P+1C	*	Р
E131512	Machine Elements and Mechanisms I. František Lopot	Z,ZK	6	3P+2C	*	Р
E372083	Measurement in Engineering Martin Novák Martin Novák (Gar.)	KZ	3	1P+0C+2L	*	Р
E311108	Mechanics III. Tomáš Vampola	Z,ZK	6	2P+2C	*	Р
E341014	Technology II.	Z,ZK	5	2P+2L	*	Р

## Characteristics of the courses of this group of Study Plan: Code=12DSA5P-KMEN Name=00 2012 D kmenové 5. semestr STR anglicky

**Electrical Circuits and Electronics** 

Introduction into theory of electrical circuits, analysis special types of electrical circuits as DC and AC. Transient states in circuits with accumulators of energy. Using Symbolic-Complex method and Fourier transformation for analysis AC circuits supplied with harmonic signal. 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

E153005 Fundamentals of Energy Conversions

The subject FEC clarify the reasons, procedures and consequences of energy conversions from sources to applications. 1. Introduction. Energy, forms and transformations of energy. Structure of primary sources to cover world energy consumption. World reserves, advances and depletion of primary energy sources. Situation on the World, EU and Czechia 2. Fossil fuels, their types and properties. Secondary fuels. Combustion of fossil fuels. Combustion equipment and their efficiency. Ecological consequences of combustion. 3. I. and II. TD law. Thermal cycles. Carnot's comparison cycle. Thermal efficiency. 4. Rankine steam cycle, thermal and real efficiency. Steam circulation carnotization. Survey of steam turbines. 5 Brighton cycle, application. Internal heat transfer, carnotization. thermal and real efficiency. Combine cycle power plant. 6. Cooling cycles, heat pumps, organic Rankine cycles. Types, working fluid, efficiency x CoF. 7. Engines with internal combustion (Otto, Diesel, Atkinson, Miller, etc), Stirling cycle, Family of Kalina cycles. 8. Renewable sources, application, importance, problems). Direct transformation (heat->Electr.). Special applications.

Machine Elements and Mechanisms I.

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

F372083 Measurement in Engineering K7

3

Overview of sensor principles for measurement of non-electrical variables (temperature, position, force, speed, acceleration, torque). Calibration and verification of measurement instruments.

E311108 Mechanics III. Z,ZK

Modeling, Dynamics of systems of particles. Dynamics of body. Mass distribution in a body. Inertia tensor. D'Alembert principle. Inertial effects of motion. Balancing of rotating bodies. Free body diagram method. Newton-Euler equations. Dynamics of multibody systems. Vibrations of systems with 1 DOF. Free oscillations. Forced oscillations excited by harmonic force and rotating unbalanced mass. Kinematic excitation. Oscillation of systems with two DOFs, torsional oscillation. Hertz theory of impact.

E341014 Technology II. Z,ZK

5

Mechanics of chip formation, cutting processes, finishing operations, non-traditional machining processes. Production rates calculation, machining economics. Automation of processes, programming of manufacture. Engineering metrology. Assembly techniques. Introduction to process planing.

Code of the group: 12DSA6P-KMEN

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

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

Credits in the group: 0

Note on the group:

12B\*A6P-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
E371047	Automatic Control Jaromír Fišer Jaromír Fišer (Gar.)	Z,ZK	5	3P+15C+05L	Z,L	Р
E133025	Design František Lopot, Daniel Hadraba František Lopot František Lopot (Gar.)	Z	4	0P+4C	*	Р
E141505	Electrical Machines and Drives  Jan Chyský, Martin Novák, Jaroslav Novák Martin Novák Jaroslav Novák (Gar.)	Z,ZK	4	2P+0C+2L	*	Р
E131026	Machine Elements and Mechanisms II. František Lopot, Daniel Hadraba František Lopot František Lopot (Gar.)	ZK	3	3P+0C+0L	*	Р
E381054	Management and Economics of the Enterprise  Michal Kavan Michal Kavan Michal Kavan (Gar.)	Z,ZK	4	2P+2C	*	Р
E181026	Momentum, Heat and Mass Transfer Martin Dostál, Vojt ch B Iohlav Martin Dostál Martin Dostál (Gar.)	Z,ZK	5	3P+1C	*	Р

### Characteristics of the courses of this group of Study Plan: Code=12DSA6P-KMEN Name=00 2012 D kmenové 6. semestr STR anglicky

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

4 E133025 Design Design, design calculations and their aplications in case of geared transmissions, axles and shafts, sliding and rolling bearings, shaft couplings and clutches.

MATLAB software as a common platform of control engineers (MATLAB is used on all including most of the laboratory classes).

E141505 **Electrical Machines and Drives** 

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.

E131026 Machine Elements and Mechanisms II. ΖK

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.

E381054 Management and Economics of the Enterprise

The study subject is intended for a wide range of students from all over the world who have successfully studied it for many previous years. The teaching goal is to acquaint technically educated foreign students with the basic procedures, methodologies and practice of management and economics of a modern, especially engineering company. The teaching concerns both the areas of finance, marketing and operational-production management and economics. The focus is on a prosperous enterprise operating within the framework of Lean Six Sigma and Industry 4.0. In addition to lectures and exercises, students also learn to be independent in their individual presentations, dedicated to the assigned professional topics of advanced business management.

E181026 Momentum, Heat and Mass Transfer Z.ZK

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

Name of the block: Compulsory elective courses

Minimal number of credits of the block: 32

The role of the block: PV

Code of the group: 12B\*A4Q-BZJ

Name of the group: 06 2012 bakalá ské zkoušky z jazyk anglicky

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:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
2041061	English-Bachelor Exam Ilona Šimice, Michaela Schusová, Hana Volejníková, Veronika Kratochvílová, Michele Le Blanc Ilona Šimice (Gar.)	Z,ZK	2	0P+2C	*	PV
2041066	Czech - Bachelor Exam Michaela Schusová, Jaroslava Kommová, Petr Laurich Jaroslava Kommová	ZK	2	0P+2C	*	PV
2041063	French - Bachelor Exam /FME Michaela Schusová, Dušana Jirovská Eliška Vítková Dušana Jirovská (Gar.)	Z,ZK	2	0P+2C	*	PV
2041062	German - Bachelor Exam / FME Michaela Schusová, Jaroslava Kommová, Petr Laurich, Eliška Vítková Jaroslava Kommová (Gar.)	Z,ZK	2	0P+2C	*	PV
2041065	Russian - Bachelor Exam / FME Michaela Schusová, Hana Volejníková, Dušana Jirovská Eliška Vítková Dušana Jirovská (Gar.)	Z,ZK	2	0P+2C	*	PV
2041064	Spanish - Bachelor Exam / FME Michaela Schusová, Jaime Andrés Villagómez Eliška Vítková Jaime Andrés Villagómez (Gar.)	Z,ZK	2	0P+2C	*	PV

Characteristics	of the courses of this group of Study Plan: Code=12B^A4Q-BZJ Name=06 2012 bakala ske z	.kousky z jazy	rk anglicky
2041061	English-Bachelor Exam	Z,ZK	2
Mapped to the Comm	non European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater dif	ficulties, to take par	rt in discussions
to write a summary,	a report and an essay, to read technical texts, to master grammar at advanced level.		
2041066	Czech - Bachelor Exam	ZK	2
Mapped to the Comm	non European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater dif	ficulties, to take par	rt in discussions
to write a summary,	a report and an essay, to read technical texts, to master grammar at advanced level.		
2041063	French - Bachelor Exam /FME	Z,ZK	2
Mapped to the Comm	non European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater dif	ficulties, to take par	rt in discussions
to write a summary,	a report and an essay, to read technical texts, to master grammar at advanced level.		
2041062	German - Bachelor Exam / FME	Z,ZK	2
Mapped to the Comm	non European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater dif	ficulties, to take par	rt in discussions
to write a summary,	a report and an essay, to read technical texts, to master grammar at advanced level.		
2041065	Russian - Bachelor Exam / FME	Z,ZK	2
Mapped to the Comm	non European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater dif	ficulties, to take par	rt in discussions
to write a summary,	a report and an essay, to read technical texts, to master grammar at advanced level.		
2041064	Spanish - Bachelor Exam / FME	Z,ZK	2
Mannadtatha Comm	and European Francisca (Lavel D2 The sim is to understand analysis longuage and loctures on tochnical tenios without greater diff	e	

Mapped to the Common European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulties, to take part in discussions, to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.

Code of the group: 12BSA6Q-OP

Name of the group: 09 2012 BSTR 6. sem oborové projekty anglicky

Requirement credits in the group: In this group you have to gain 10 credits

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

Credits in the group: 10 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
E152091	Project	KZ	2	0P+2C	*	PV
E362091	Project	KZ	2	0P+2C		PV
E372091	Project	KZ	2	0P+2C	*	PV
E182091	Project	KZ	2	0P+2C	*	PV

Characteristics of the courses of this group of Study Plan: Code=12BSA6Q-OP Name=09 2012 BSTR 6. sem oborové projekty anglicky

E152091	Project	KZ	2
E362091	Project	KZ	2
E372091	Project	KZ	2
An individual project from	im the branch of specialization (instrumentation, control engineering, informatics), or individual work, related to another subject	ect.	
E182091	Project	KZ	2
Absolvent se seznámí se základy oboru Procesní technika.			

Code of the group: 12BSA6Q-PP

Name of the group: 10 2012 BSTR 6. sem prezentace projekt anglicky 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 5 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
E153091	Project Presentation	Z	4	4B	*	PV
E363091	Project Presentation	Z	4	4B		PV
E373091	Project Presentation	Z	4	4B	*	PV
E183091	Project Presentation	Z	4	0P+4C	*	PV

Characteristics of the courses of this group of Study Plan: Code=12BSA6Q-PP Name=10 2012 BSTR 6. sem prezentace projekt anglicky

E153091	Project Presentation	Z	4
E363091	Project Presentation	Z	4
E373091	Project Presentation	Z	4
Presentation of the pro	ect prepared for the subject E372091. Report in pdf format and prepared presentation (MS Powerpoint, Impress) required. P	resentation, discu	ssion (questions
of another students and	d their supervisors).		
E183091	Project Presentation	Z	4
Preparation and preser	tation of a given project theme.	•	

Name of the block: Elective courses

Minimal number of credits of the block: 32

The role of the block: V

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

Name of the group: 02 2012 ALFA volitelné pro STR anglicky

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:

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

Name of the group: 05 2012 doporu ené seminá e anglicky

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
E026002	Physics I Seminary Zden k Kohout, Zuzana Budinská, Petr Duchá ek, Jan Novák, Miroslav Jílek, Daniel Tischler, Rudolf Sýkora Zden k Kohout (Gar.)	Z	2	0P+2C	*	V
E026003	Physics II Seminary Petr Duchá ek, Jan Novák, Rudolf Sýkora Petr Duchá ek	Z	2	0P+2C	*	V

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

E026002	Physics I Seminary	Z	2
Solving of problems co	rresponding to the lectures of Physics I.		
E026003	Physics II Seminary	Z	2
The subject is intended	for students who need more detailed practising and improvement (including knowledge from former physics courses, or high	n-school knowledg	ge) necessary for
successful finishing Ph	visios II course The instructions are analogical to seminars with a short corresponding theoretical background. The link between	en physical conce	nts and methods

The subject is intended for students who need more detailed practising and improvement (including knowledge from former physics courses, or high-school knowledge) necessary for successful finishing Physics II course. The instructions are analogical to seminars with a short corresponding theoretical background. The link between physical concepts and methods of solution of typical problems is underlying.

Code of the group: 12B\*A1V-DOP ZJK

Name of the group: 12 2012 doporu ené základní jazykové kurzy anglicky

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
E046117	Czech - Advanced Jaroslava Kommová	Z	2	0+2	Z	V
E046125	Czech - Lower Intermediate  Jaroslava Kommová	Z	2	0+2	Z	V
E046128	Czech - Upper Intermediate  Hana Volejníková, Petr Laurich Jaroslava Kommová	Z	2	0+2	L	V
E046118	Czech Advanced Hana Volejníková, Petr Laurich Jaroslava Kommová	Z	2	0+2	L	V
E046120	Czech for Beginners II.  Jaroslava Kommová	Z	2	0+2	*	V
E046119	Czech Language for Beginners I.  Jaroslava Kommová	Z	2	0+2	*	V
E046126	Czech Lower Intermediate  Hana Volejníková, Petr Laurich Petr Laurich	Z	2	0+2	L	V
E046127	Czech Upper Intermediate  Jaroslava Kommová	Z	2	0+2	Z	V
E046078	German - Lower Intermediate Course  Jaroslava Kommová	Z	2	0+2	Z	V
E046079	German Lower Intermediate Michaela Schusová, Jaroslava Kommová, Petr Laurich, Eliška Vítková Jaroslava Kommová Jaroslava Kommová (Gar.)	Z	2	0+2	L	V
E046080	German Upper Intermediate Eliška Vítková	Z	2	0+2	Z	V
E046081	German Upper Intermediate  Michaela Schusová, Jaroslava Kommová, Petr Laurich, Eliška Vítková  Jaroslava Kommová Jaroslava Kommová (Gar.)	Z	2	0+2	L	V
E046082	German Advanced	Z	2	0+2	Z	V
E046083	German Advanced Jaroslava Kommová, Petr Laurich Jaroslava Kommová	Z	2	0+2	L	V
E046076	Jaroslava Kommová	Z	2	0+2	Z	V
E046077	German Beginners Jaroslava Kommová Jaroslava Kommová Jaroslava Kommová (Gar.)	Z	2	0+2	L	V

Characteristics of the courses of this group of Study Plan: Code=12B\*A1V-DOP ZJK Name=12 2012 doporu ené základní jazykové kurzy anglicky

E046117 | Czech - Advanced | Z | 2 | Comprehension of spoken language as well as lectures in Czech on topics familiar to the student. Communication with native speakers, participation in discussions. Expressing opinions.

Written skills. Ability to write an essay or a report. Reading and understanding texts concerning currant issues and popular scientific and technical articles.

E046125	Czech - Lower Intermediate	Z	2
Aim: Understanding	clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about th	nem. Writing in a si	I
amiliar topics. Read	ing and comprehension of simple texts. Improvement of professional language.	_	
E046128	Czech - Upper Intermediate	Z	2
Mapped to the Comi	mon European Framework of Reference Level A2-B1. The aim is to extend language skills taking into consideration professions	al Czech and comr	non professiona
erminology. Compre	hension of standard Czech speech and conversation about topics of everyday life - at school, at work, during free time, on inte	ermediate level. Bro	padening the
knowledge technical	language.		
E046118	Czech Advanced	Z	2
Mapped to the level	of Common European Framework of Reference: B1- B2 The aim: comprehension of spoken Czech as well as lectures given in	Czech without gre	at difficulties ar
active participation in	n a discussion. Written and oral skills on advanced level. Ability to write a summary, a report, an essay. Reading and comprehe	ension of popular-so	cientific and
scientific articles or t	exts from student's field of studies without difficulties. Grammar structures on advanced level.		
E046120	Czech for Beginners II.	Z	2
Mapped to the Comr	non European Framework of Reference Level A1 Aim: Basic vocabulary of everyday life in a written and spoken form. Understa	inding and use of b	asic expression
of general scientific t	terminology (professional language).		
E046119	Czech Language for Beginners I.	Z	2
Basic vocabulary of	everyday life in a spoken and written form. Understanding and use of basic expressions of general scientific terminology (profe	essional language)	'
E046126	Czech Lower Intermediate	Z	2
Mapped to the level	of Common European Framework of Reference A2 Aim: Understanding clearly what is spoken about everyday situations whicl	h 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	t of professional lar	nguage.
E046127	Czech Upper Intermediate	Z	2
Jnderstanding stand	dard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ab	ility to describe exp	periences and
events, briefly explai	n one's opinions and plans. Reading and understanding general and technical texts.		
E046078	German - Lower Intermediate Course	Z	2
Aim: Understanding	clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about th	nem. Writing in a sii	mple way abou
familiar topics Read	ing and comprehension of simple texts. Improvement of professional language.		
arrillar topico. I toda	g		
	German Lower Intermediate	Z	2
E046079		_	_
E046079 Mapped to the level	German Lower Intermediate	ich a student meet	s either at scho
E046079 Mapped to the level or in his/her free time	German Lower Intermediate of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations whi	ich a student meet	s either at scho
E046079 Mapped to the level or in his/her free time E046080	German Lower Intermediate of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations whi e and speaking about them. Writing in a simple way about familiar topics. reading and comprehesion of simple texts. Improvem	ich a student meets ent of professional	s either at scho language.
E046079 Mapped to the level or in his/her free time E046080 Understanding stand	German Lower Intermediate of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations whi e and speaking about them. Writing in a simple way about familiar topics. reading and comprehesion of simple texts. Improvem German Upper Intermediate	ich a student meets ent of professional	s either at scho language.
E046079 Mapped to the level or in his/her free time E046080 Understanding stancevents, briefly explain	German Lower Intermediate of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations while and speaking about them. Writing in a simple way about familiar topics, reading and comprehesion of simple texts. Improvem German Upper Intermediate dard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. About 1	ich a student meets ent of professional	s either at scho language.
E046079 Mapped to the level or in his/her free time E046080 Understanding stancevents, briefly explaie	German Lower Intermediate of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations while and speaking about them. Writing in a simple way about familiar topics, reading and comprehesion of simple texts, Improvem German Upper Intermediate dard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. About none's opinions and plans.	ich a student meets ent of professional Z illity to describe exp	s either at scholanguage.  2 peroences and
E046079 Mapped to the level or in his/her free time E046080 Understanding stancevents, briefly explaie E046081 Mapped to the level	German Lower Intermediate of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations while and speaking about them. Writing in a simple way about familiar topics. reading and comprehesion of simple texts. Improvem German Upper Intermediate dard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. About none's opinions and plans. German Upper Intermediate	ich a student meets ent of professional Z illity to describe exp Z comes across at w	s either at schollanguage.  2 percences and  2 rork, at school,
E046079 Mapped to the level of in his/her free time E046080 Understanding stancevents, briefly explai E046081 Mapped to the level during free time, and	German Lower Intermediate of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations while and speaking about them. Writing in a simple way about familiar topics, reading and comprehesion of simple texts. Improvem German Upper Intermediate dard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. About none's opinions and plans.  German Upper Intermediate of Common European Framework of Reference:A2 - B1 Understanding standard speech about familiar topics, that a students	ich a student meets ent of professional Z illity to describe exp Z comes across at w	s either at schollanguage.  2 percences and  2 rork, at school,
E046079 Mapped to the level of or in his/her free time E046080 Understanding stance events, briefly explair E046081 Mapped to the level of during free time, and E046082	German Lower Intermediate of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations while and speaking about them. Writing in a simple way about familiar topics, reading and comprehesion of simple texts. Improvem German Upper Intermediate dard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Abin one's opinions and plans.  German Upper Intermediate of Common European Framework of Reference:A2 - B1 Understanding standard speech about familiar topics, that a students talking about these topics. Ability to describe experiences and events, explain one's opinions and plans. Reading and understanding about these topics.	ich a student meets lent of professional  Z lility to describe exp  Z comes across at w tanding general an  Z	seither at school language.  2 percences and  2 pork, at school, d technical tex
E046079 Mapped to the level of in his/her free time E046080 Understanding stance events, briefly explait E046081 Mapped to the level of during free time, and E046082 Comprehension of specific standard	German Lower Intermediate of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations while and speaking about them. Writing in a simple way about familiar topics, reading and comprehesion of simple texts. Improvem German Upper Intermediate dard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. About none's opinions and plans.  German Upper Intermediate of Common European Framework of Reference:A2 - B1 Understanding standard speech about familiar topics, that a students at talking about these topics. Ability to describe experiences and events, explain one's opinions and plans. Reading and understanding German Advanced	ich a student meets lent of professional  Z lility to describe exp  Z comes across at w tanding general an  Z stion in discussions	s either at school language.  2 percences and  2 pork, at school, d technical tex  2
E046079 Mapped to the level of or in his/her free time E046080 Understanding stance events, briefly explair E046081 Mapped to the level of during free time, and E046082 Comprehension of spopinions. Written skill	German Lower Intermediate of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations while and speaking about them. Writing in a simple way about familiar topics, reading and comprehesion of simple texts. Improvem German Upper Intermediate dard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. About none's opinions and plans.  German Upper Intermediate of Common European Framework of Reference:A2 - B1 Understanding standard speech about familiar topics, that a students at talking about these topics. Ability to describe experiences and events, explain one's opinions and plans. Reading and understanding standard speech about familiar topics, that a students of talking about these topics. Ability to describe experiences and events, explain one's opinions and plans. Reading and understanding standard speech about familiar topics, that a students of talking about these topics. Ability to describe experiences and events, explain one's opinions and plans. Reading and understanding standard speech about familiar topics, that a students of talking about these topics. Ability to describe experiences and events, explain one's opinions and plans. Reading and understanding standard speech about familiar topics, that a students of talking about these topics are standard speech about familiar topics, that a students of talking about these topics are standard speech about familiar topics, that a students of talking about these topics are standard speech about familiar topics are standard speech about familiar topics, and talking about these topics.	ich a student meets lent of professional  Z lility to describe exp  Z comes across at w tanding general an  Z stion in discussions	s either at school language.  2 percences and  2 pork, at school, d technical text
E046079 Mapped to the level of in his/her free time E046080 Understanding stance events, briefly explair E046081 Mapped to the level of during free time, and E046082 Comprehension of spopinions. Written skill E046083	German Lower Intermediate of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations while and speaking about them. Writing in a simple way about familiar topics, reading and comprehesion of simple texts. Improvem German Upper Intermediate dard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Abin one's opinions and plans.  German Upper Intermediate of Common European Framework of Reference:A2 - B1 Understanding standard speech about familiar topics, that a students of talking about these topics. Ability to describe experiences and events, explain one's opinions and plans. Reading and understanding standard speech about familiar topics, that a students of talking about these topics. Ability to describe experiences and events, explain one's opinions and plans. Reading and understanding standard speech about familiar topics, that a students of talking about these topics. Ability to describe experiences and events, explain one's opinions and plans. Reading and understanding texts concerning currant issues and popular scientific and the students of the studen	ich a student meetsent of professional  Z iility to describe exp  Z comes across at watanding general an  Z ation in discussionstechnical articles.  Z	seither at school language.  2 peroences and  2 pork, at school, d technical text  2 percessing
E046079 Mapped to the level of or in his/her free time E046080 Understanding stance events, briefly explait E046081 Mapped to the level of during free time, and E046082 Comprehension of spopinions. Written skill E046083 Mapped to the level of the level	German Lower Intermediate of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations while and speaking about them. Writing in a simple way about familiar topics, reading and comprehesion of simple texts. Improvem German Upper Intermediate dard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Abin one's opinions and plans.  German Upper Intermediate of Common European Framework of Reference:A2 - B1 Understanding standard speech about familiar topics, that a students at talking about these topics. Ability to describe experiences and events, explain one's opinions and plans. Reading and understanding standard speech about these topics. Ability to describe experiences and events, explain one's opinions and plans. Reading and understanding language as well as lectures in German on topics familiar to the student. Communication with native speakers, participal lists. Ability to write an essay or a report. Reading and understanding texts concerning currant issues and popular scientific and the German Advanced.	ich a student meetient of professional  Z  illity to describe exp  Z  comes across at watanding general an  Z  ation in discussionstechnical articles.  Z  in German without	seither at school language.  2 peroences and  2 pork, at school, d technical tex  2 s. Expressing  2 great difficulties
E046079  Mapped to the level of or in his/her free time E046080  Understanding stance events, briefly explain E046081  Mapped to the level of during free time, and E046082  Comprehension of spopinions. Written skill E046083  Mapped to the level and active participation	German Lower Intermediate of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations while and speaking about them. Writing in a simple way about familiar topics, reading and comprehesion of simple texts. Improvem German Upper Intermediate dard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Abin one's opinions and plans.  German Upper Intermediate of Common European Framework of Reference:A2 - B1 Understanding standard speech about familiar topics, that a students at talking about these topics. Ability to describe experiences and events, explain one's opinions and plans. Reading and understalls. Ability to write an essay or a report. Reading and understanding texts concerning currant issues and popular scientific and to German Advanced  German Advanced of Common European Framework of Reference: B1- B2 The aim: comprehension of spoken German as well as lectures given	ich a student meetient of professional  Z  illity to describe exp  Z  comes across at watanding general an  Z  ation in discussionstechnical articles.  Z  in German without	seither at school language.  2 peroences and  2 pork, at school, d technical tex  2 s. Expressing  2 great difficulties
E046079  Mapped to the level of in his/her free time E046080  Understanding stance events, briefly explain E046081  Mapped to the level of during free time, and E046082  Comprehension of spopinions. Written skill E046083  Mapped to the level and active participatis scientific articles or the series of the ser	German Lower Intermediate of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations while and speaking about them. Writing in a simple way about familiar topics, reading and comprehesion of simple texts. Improvem German Upper Intermediate dard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Abin one's opinions and plans.  German Upper Intermediate of Common European Framework of Reference:A2 - B1 Understanding standard speech about familiar topics, that a students at talking about these topics. Ability to describe experiences and events, explain one's opinions and plans. Reading and understalls. Ability to write an essay or a report. Reading and understanding texts concerning currant issues and popular scientific and to German Advanced of Common European Framework of Reference: B1- B2 The aim: comprehension of spoken German as well as lectures given ion in a discussion. Written and oral skills on advanced level. Ability to write a summary, a report, an essay. Reading and comp	ich a student meetient of professional  Z  illity to describe exp  Z  comes across at watanding general an  Z  ation in discussionstechnical articles.  Z  in German without	seither at school language.  2 peroences and  2 pork, at school, d technical text  2 sexpressing  2 great difficulties
E046079  Mapped to the level of or in his/her free time E046080  Understanding stance events, briefly explain E046081  Mapped to the level of during free time, and E046082  Comprehension of spopinions. Written skill E046083  Mapped to the level and active participation	German Lower Intermediate of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations while and speaking about them. Writing in a simple way about familiar topics, reading and comprehesion of simple texts. Improvem German Upper Intermediate diard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Abin one's opinions and plans.  German Upper Intermediate of Common European Framework of Reference:A2 - B1 Understanding standard speech about familiar topics, that a students of talking about these topics. Ability to describe experiences and events, explain one's opinions and plans. Reading and understalls. Ability to write an essay or a report. Reading and understanding texts concerning currant issues and popular scientific and to German Advanced of Common European Framework of Reference: B1- B2 The aim: comprehension of spoken German as well as lectures given ion in a discussion. Written and oral skills on advanced level. Ability to write a summary, a report, an essay. Reading and complexests from student's field of studies without difficulties. Grammar structures on advanced level.	ich a student meetient of professional  Z  illity to describe exp  Z  comes across at watanding general an  Z  ation in discussions technical articles.  Z  in German without rehension of popul	seither at scholanguage.  2 peroences and  2 pork, at school, d technical text  2 percessing  2 great difficulties ar-scientific an
E046079 Mapped to the level of in his/her free time E046080 Understanding stance events, briefly explait E046081 E046081 Mapped to the level of during free time, and E046082 Comprehension of significant. Written skill E046083 Mapped to the level of and active participation is cientific articles or telepade E046076 E046077	German Lower Intermediate of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations while and speaking about them. Writing in a simple way about familiar topics, reading and comprehesion of simple texts. Improvem German Upper Intermediate dard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Abin one's opinions and plans.  German Upper Intermediate of Common European Framework of Reference:A2 - B1 Understanding standard speech about familiar topics, that a students at talking about these topics. Ability to describe experiences and events, explain one's opinions and plans. Reading and understalls. Ability to write an essay or a report. Reading and understanding texts concerning currant issues and popular scientific and to German Advanced of Common European Framework of Reference: B1- B2 The aim: comprehension of spoken German as well as lectures given ion in a discussion. Written and oral skills on advanced level. Ability to write a summary, a report, an essay. Reading and comp	ich a student meetsent of professional  Z illity to describe exp  Z comes across at watanding general an  Z attion in discussions technical articles.  Z in German without rehension of popul	seither at scholanguage.  2 peroences and  2 peroences and decention text at school, decentical text at school, decentical text ar-scientific and ar-scientific and a control text are arranged as a control text are arranged as a control text are arranged as a control text are are arranged as a control text are arranged as a control text are arranged as a control text are are arranged as a control text are are arranged as a control text are are a control text are arranged as

# List of courses of this pass:

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

2041066	Czech - Bachelor Exam	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	ies, to take part in o	discussions,
	to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.		
E011009	Mathematics III.	Z,ZK	5
<b>5</b> 044004	An introductory course in ordinary differential equation and infinite series.	7.71	
E011021	Constructive Geometry	Z,ZK	6
F044040	The subject is focused on geometric objects in the space - curves, surfaces and solids and their properties and mutual relation		
E011049	Numerical Mathematics	Z,ZK	4
E011056	Mathematics I.	Z,ZK	8
_	ter emphasis is placed on the theoretical basis of the concepts discussed and on the derivation of basic relationships and connection • the procedures for solving problems with parametric input. In addition, students will gain extended knowledge in some thematic areas: e	-	
will also get to know	of a matrix, Taylor polynomial, integral as a limit function, integration of some special functions.	igeririarribers aria e	igenvectors
E011062	Mathematics II	Z,ZK	8
	set, boundary in E^k. Real function of k-variables. Partial derivatives and differentiability. Gradient and directional derivative. Differenti		-
	Function given implicitly. Local and global (= absolute) extremes of a function of more variables. Double integral, volume (=triple) integral,		
of integrals to pola	r, cylindrical and spherical coordinates. A simple smooth curve and line integral of a scalar and vector function. Circulation and Green	n's theorem. A pote	ntial vector
field, independent	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	r field through a su	ırface. The
	Gauss-Ostrogradskij theorem.		
E012035	Algorithmization and Programming	KZ	.4
	MATLAB and its programming language. MATLAB command line. Elementary commands, variable, assignment and expression. Matrix and expression of simple problems in MATLAB. Creative commands. Matrix expressions. Systems		
	nput and output. Condition and cycle. Algorithmization of simple problems in MATLAB. Graphical commands. Matrix operations. Syste ructure of program. Variables, expressions, assignment, and input / output commands. switch. For cycle. Arrays and files. Pointers. St		
	s: minimum, mean, norm, numerical integration, bisection method, Newton method, matrix operations. Direct methods for solution of s	•	
E012037	Computer Graphics	KZ	3
	used on the mathematical theory of the curves and surfaces in computer graphics and their visualisation. The Rhinoceros - NURBS n		-
,	to demonstrate the geometrical properties of the curves and surfaces.	· ·	
E021025	Physics II.	Z,ZK	4
Faraday's law of ele	ectromagnetic induction. Maxwell's equations, electromagnetic waves. Light, wave optics, geometrical optics. Quantum properties of elec	tromagnetic waves	. Interaction
	natter. Photoelectric effect. Wave-particle mature of matter. Quantum-mechanical description of particle's motion. Hydrogen atom and		
<u> </u>	ser. Band theory of solids, semiconductors. Nucleus, radioactivity, sources of nuclear energy. Laboratories - measurements of 6 exper		
E021041	Physics I.	Z,ZK	7
-	namics of a particle motion. Principle of conservation of energy. System of particles, centre of mass. Rigid body. Continuum, elastic pro	-	
	echanics. Temperature and heat transfer. Kinetic theory of gases. Thermodynamics. Electric field, current, conductivity, resistance. Co netic field. Magnetic materials. Electromagnetic field. Laboratories - accuracy of measurements, systematic and random errors, uncer		
insulators. Mag	measurements, regression, measurements of 11 various experiments related to the lectures.	tainty of direct and	ilidilect
E026002	Physics I Seminary	Z	2
2020002	Solving of problems corresponding to the lectures of Physics I.	_	_
E026003	Physics II Seminary	Z	2
The subject is inter	nded for students who need more detailed practising and improvement (including knowledge from former physics courses, or high-scl	nool knowledge) ne	cessary for
successful finishing	Physics II course. The instructions are analogical to seminars with a short corresponding theoretical background. The link between p	hysical concepts a	nd methods
	of solution of typical problems is underlying.		
E046076		Z	2
E046077	German Beginners	Z	2
Mapped to the Co	ommon European Framework of Reference level A1. Basic vocabulary of everyday lifein a written and spoken form. understanding and	d use of basic expr	essions of
F040070	general scientific terminology.	- 1	
E046078	German - Lower Intermediate Course 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	2
Aim. Understandir		Mriting in a simple	
E046079		Writing in a simple	way about
	familiar topics. Reading and comprehension of simple texts. Improvement of professional language.		
	familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  German Lower Intermediate	Z	2
Mapped to the leve	familiar topics. Reading and comprehension of simple texts. Improvement of professional language.	Z student meets eith	2 er at school
Mapped to the leve	familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  German Lower Intermediate  I of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a	Z student meets eith	2 er at school
Mapped to the level or in his/her free E046080	familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  German Lower Intermediate  I of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a time and speaking about them. Writing in a simple way about familiar topics. reading and comprehesion of simple texts. Improvement	Z student meets eith at of professional la	2 er at school inguage.
Mapped to the level or in his/her free E046080	familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  German Lower Intermediate  I of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a time and speaking about them. Writing in a simple way about familiar topics. reading and comprehesion of simple texts. Improvement German Upper Intermediate	Z student meets eith at of professional la	2 er at school inguage.
Mapped to the leve or in his/her free E046080 Understanding sta	familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  German Lower Intermediate I of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a time and speaking about them. Writing in a simple way about familiar topics. reading and comprehesion of simple texts. Improvement German 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.  German Upper Intermediate	Z student meets eith at of professional la Z to describe expero	2 er at school inguage. 2 ences and
Mapped to the leve or in his/her free E046080 Understanding state E046081 Mapped to the leve	familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  German Lower Intermediate I of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a etime and speaking about them. Writing in a simple way about familiar topics, reading and comprehesion of simple texts. Improvement German Upper Intermediate and art 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.  German Upper Intermediate el of Common European Framework of Reference:A2 - B1 Understanding standard speech about familiar topics, that a students com-	Z student meets eith at of professional la Z to describe expero Z les across at work,	2 er at school inguage. 2 ences and 2 at school,
Mapped to the leve or in his/her free E046080 Understanding sta E046081 Mapped to the leve during free time, and the level of the level	familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  German Lower Intermediate  I of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a etime and speaking about them. Writing in a simple way about familiar topics. reading and comprehesion of simple texts. Improvement German Upper Intermediate and 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.  German Upper Intermediate  el of Common European Framework of Reference:A2 - B1 Understanding standard speech about familiar topics, that a students come at talking about these topics. Ability to describe experiences and events, explain one's opinions and plans. Reading and understanding	Z student meets eith at of professional la Z to describe expero Z les across at work,	2 er at school inguage. 2 ences and 2 at school, innical texts.
Mapped to the leve or in his/her free E046080 Understanding sta E046081 Mapped to the leve during free time, at E046082	familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  German Lower Intermediate  I of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a extime and speaking about them. Writing in a simple way about familiar topics. reading and comprehesion of simple texts. Improvement German Upper Intermediate and 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.  German Upper Intermediate  el of Common European Framework of Reference:A2 - B1 Understanding standard speech about familiar topics, that a students come talking about these topics. Ability to describe experiences and events, explain one's opinions and plans. Reading and understanding German Advanced	z student meets eith at of professional la z to describe expero  Z ses across at work, ag general and tect Z	2 er at school inguage. 2 ences and 2 at school, inical texts. 2
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Mapped to the leve or in his/her free E046080 Understanding state E046081 Mapped to the leve during free time, ar E046082 Comprehension opinions. E046083 Mapped to the leve and active particip E046117 Comprehension of Writte E046118	familiar topics. Reading and comprehension of simple texts. Improvement of professional language.  German Lower Intermediate  I of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a time and speaking about them. Writing in a simple way about familiar topics. reading and comprehesion of simple texts. Improvemer German 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.  German Upper Intermediate  el of Common European Framework of Reference:A2 - B1 Understanding standard speech about familiar topics, that a students come datalking about these topics. Ability to describe experiences and events, explain one's opinions and plans. Reading and understanding German Advanced  of spoken language as well as lectures in German on topics familiar to the student. Communication with native speakers, participation written skills. Ability to write an essay or a report. Reading and understanding texts concerning currant issues and popular scientific and of Common European Framework of Reference: B1- B2 The aim: comprehension of spoken German as well as lectures given in Geation in a discussion. Written and oral skills on advanced level. Ability to write a summary, a report, an essay. Reading and comprehension in a discussion. Written and oral skills on advanced level. Ability to write a summary, a report, an essay. Reading and comprehension of spoken German as well as lectures given in Geation in a discussion. Written and oral skills on advanced level. Ability to write a summary, a report, an essay. Reading and comprehension of spoken German as well as lectures given in Geation in a discussion. Written and oral skills on advanced level. Ability to write a summary, a report, an essay, reading and comprehension of spoken German as well as lectures given in Geation in a discussion. Written and oral skills on adva	student meets eith at of professional la Z to describe expero Z to describe expero Z to describe expero A Z to describe A Z to describe expero A Z to describe e	2 er at school inguage. 2 ences and  2 at school, innical texts. 2 expressing es. 2 t difficulties cientific and  2 ng opinions.
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E046119			
	Czech Language for Beginners I.	Z	2
	abulary of everyday life in a spoken and written form. Understanding and use of basic expressions of general scientific terminology (p	roressional langua	ge) 2
E046120	Czech for Beginners II. Innon European Framework of Reference Level A1 Aim: Basic vocabulary of everyday life in a written and spoken form. Understanding	and use of basic	l
Mapped to the Con	of general scientific terminology (professional language).	g and doo of baolo	одріосоюно
E046125	Czech - Lower Intermediate	Z	2
Aim: Understandin	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
	familiar topics. Reading and comprehension of simple texts. Improvement of professional language.		
E046126	Czech Lower Intermediate	Z	2
	rel of Common European Framework of Reference A2 Aim: Understanding clearly what is spoken about everyday situations which a		
	ne and speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvement	oi proiessional iar	
E046127	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	to describe experi	2
Oriderstanding st	events, briefly explain one's opinions and plans. Reading and understanding general and technical texts.	to describe expeni	ences and
E046128	Czech - Upper Intermediate	Z	2
	nmon European Framework of Reference Level A2-B1. The aim is to extend language skills taking into consideration professional Cz	ech and common	l
terminology. Con	prehension of standard Czech speech and conversation about topics of everyday life - at school, at work, during free time, on interm	nediate level. Broad	lening the
	knowledge technical language.		
E131002	Engineering Design II	Z,ZK	4
	entals of GPS (Geometrical Product Specification). Students will get critical knowledge about ISO system of limits and fits, tolerancing	-	-
tolerance, dimer	sional loops, tolerancing of angles and cones, tolerancing of threads. Integral part of course is a project where students apply and project where students apply app	ractice their knowle	edge from
E131026	lectures.  Machine Elements and Mechanisms II.	ZK	3
	design calculations and aplication of axles and shafts, sliding and rolling bearings, shaft connections, elements of crank mechanism,		_
Trommary doorging	and fittings.	pipolinioo ana alon	40000001100
E131512	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	1 '	_
(belt, chain, fricti	on, gear drives). Seminars are devoted to practical individual solution of simple design projects - tasks with motion screws, preloaded	d connecting bolts,	clamped,
	nd key joints between shafts and hubs and tasks with welded and riveted joints. Sketching of machine elements and their simple asser	-	-
	rk. Supporting systemes, mechanical joints, material joints, joining elements, mechanical transmissions, dimensioning, loading capac		
E133013	Engineering Design III.	Z	2
E133014	Engineering Design IV.	Z	2
Information about g	peneral principles of a new technical product design, stages of development of a new product, the designer fundamental assignment is		ous product
F422025	including. Designing of a dribling jig. A drilling jig is a device by means of which holes on many duplicate parts may be drilled exact	7	4
E133025	Design , design calculations and their aplications in case of geared transmissions, axles and shafts, sliding and rolling bearings, shaft coupl		4
E141504	Electrical Circuits and Electronics		
L 17 1007		/ /K	1
		Z,ZK ergy. Using Symbo	lic-Complex
Introduction into the	eory of electrical circuits, analysis special types of electrical circuits as DC and AC. Transient states in circuits with accumulators of en r transformation for analysis AC circuits supplied with harmonic signal. El. Power and Energy. Introduction into electronics. Principle a	ergy. Using Symbo	lic-Complex
Introduction into the method and Fourie	eory of electrical circuits, analysis special types of electrical circuits as DC and AC. Transient states in circuits with accumulators of en	ergy. Using Symbo and typical paramet	lic-Complex ters of basic
Introduction into the method and Fourie semiconductor co	eory of electrical circuits, analysis special types of electrical circuits as DC and AC. Transient states in circuits with accumulators of en r transformation for analysis AC circuits supplied with harmonic signal. El. Power and Energy. Introduction into electronics. Principle a mponents. Application in electronic circuits (rectifier, stabilizer, power control, operational amplifier). Analogue and digital circuits. Pri signal processing. Logical circuits, converters, microprocessor.	ergy. Using Symbo and typical paramet nciple of analogue	lic-Complex ters of basic
Introduction into the method and Fourie semiconductor co	eory of electrical circuits, analysis special types of electrical circuits as DC and AC. Transient states in circuits with accumulators of en r transformation for analysis AC circuits supplied with harmonic signal. El. Power and Energy. Introduction into electronics. Principle a mponents. Application in electronic circuits (rectifier, stabilizer, power control, operational amplifier). Analogue and digital circuits. Pri signal processing. Logical circuits, converters, microprocessor.  Electrical Machines and Drives	ergy. Using Symbo and typical paramet nciple of analogue Z,ZK	lic-Complex ters of basic and digital
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of the body in 3D. MBS - Multi Body Systems. Static determinancy and mobility, composition. Analytical solution of equilibrium for MBS systems. Truss systems. Center of gravity. Internal forces. The balance of the body and of multibody systems with friction. Mechanical work. Power. Efficiency. Equilibrium position. E311102 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 E311108 Mechanics III Modeling. Dynamics of systems of particles. Dynamics of body. Mass distribution in a body. Inertia tensor. D'Alembert principle. Inertial effects of motion. Balancing of rotating bodies. Free body diagram method. Newton-Euler equations. Dynamics of multibody systems. Vibrations of systems with 1 DOF. Free oscillations. Forced oscillations excited by harmonic force and rotating unbalanced mass. Kinematic excitation. Oscillation of systems with two DOFs, torsional oscillation. Hertz theory of impact. E321039 Materials Science II. Fundamentals of metallurgy, iron-carbon alloys and influence of other elements, phase transformations, thermal, combined chemical and thermal and thermo-mechanical processing, technical iron-carbon alloys, non-ferrous metals and their alloys, plastics, structural ceramics, composites, selection of materials. E322029 Materials Science I. 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. Technology I. Z,ZK Foundry properties of metals. Treatment. Pouring. Casting solidification. Moulding and core making. Thermal treatment. Plastic deformation. Division of forming processes. Semi-products, heating-up. Cutting. Cold and hot forming. Welds. Weldability. Weldment testing. Thermal cutting. Brazing. Surface treatments. E333038 Fundamentals of Technology I. Ζ 3 The study of manufacturing processes forms a core subject area for a majority of mechanical enginnering stdents. It contains basic concept of three manufacturing technologies such as casting, forming and welding, including basic terms, methods and materials. E341014 Technology II. Z,ZK 5 Mechanics of chip formation, cutting processes, finishing operations, non-traditional machining processes. Production rates calculation, machining economics. Automation of processes, programming of manufacture. Engineering metrology. Assembly techniques. Introduction to process planing. E362091 Project ΚZ 2 E363091 **Project Presentation** Ζ 4 Z,ZK 5 E371047 **Automatic Control** Automatic controllers are important part of many industrial processes. The goal of this course is to introduce students into basic knowledge of automatic control theory and practice like transfer functions, open versus closed loop control, design of controllers and frequency based analysis of control systems. The course also concentrates on logic control and control via programmable logic controllers. Some 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 (MATLAB is used on all including most of the laboratory classes). E372041 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 and presenting a web page E372083 Measurement in Engineering Overview of sensor principles for measurement of non-electrical variables (temperature, position, force, speed, acceleration, torque). Calibration and verification of measurement instruments. E372091 Project ΚZ 2 An individual project from the branch of specialization (instrumentation, control engineering, informatics), or individual work, related to another subject E373091 4 Project Presentation Presentation of the project prepared for the subject E372091. Report in pdf format and prepared presentation (MS Powerpoint, Impress) required. Presentation, discussion (questions of another students and their supervisors). Management and Economics of the Enterprise The study subject is intended for a wide range of students from all over the world who have successfully studied it for many previous years. The teaching goal is to acquaint technically educated foreign students with the basic procedures, methodologies and practice of management and economics of a modern, especially engineering company. The teaching concerns both the areas of finance, marketing and operational-production management and economics. The focus is on a prosperous enterprise operating within the framework of Lean Six

Sigma and Industry 4.0. In addition to lectures and exercises, students also learn to be independent in their individual presentations, dedicated to the assigned professional topics of advanced business management.

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