## Study plan

# Name of study plan: 09 54 59 00 BSTR 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: 305 Elective courses credits: -126 Sum of credits in the plan: 179 Note on the plan: t etí pokus

Name of the block: Compulsory courses in the program Minimal number of credits of the block: 241 The role of the block: P

Code of the group: 12B-KMENA TZI STR Name of the group: 01 2012 souhrn skupin 12B\*AiP-KMEN pro i od 1 do 6 Requirement credits in the group: In this group you have to gain 149 credits Requirement courses in the group: In this group you have to complete 35 courses Credits in the group: 149

Note on the g						
Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members)	Completion	Credits	Scope	Semester	Role
	Tutors, <b>authors</b> and guarantors (gar.)					
E012035	Algorithmization and Programming Petr Svá ek, Marta ertíková, David Trdli ka Marta ertíková Petr Svá ek (Gar.)	КZ	4	1P+2C	*	Ρ
E371047	Automatic Control Jaromír Fišer Jaromír Fišer Jaromír Fišer (Gar.)	Z,ZK	5	3P+15C+05L	Z,L	Р
E182019	Chemistry Jaromír Štancl Jaromír Štancl Jaromír Štancl (Gar.)	KZ	3	2P+1C	*	Р
E012037	Computer Graphics Nikola Pajerová, Ivana Linkeová Ivana Linkeová (Gar.)	KZ	3	1P+1C	*	Р
E372041	Computer Support for Study	KZ	3	1P+1C	*	Р
E011021	Constructive Geometry Ivana Linkeová	Z,ZK	6	3P+2C	Z	Ρ
E141504	Electrical Circuits and Electronics Jan Chyský, Martin Novák Martin Novák Jan Chyský (Gar.)	Z,ZK	4	2P+0C+2L	*	Р
E141505	Electrical Machines and Drives Jan Chyský, Martin Novák, Jaroslav Novák Martin Novák Jaroslav Novák (Gar.)	Z,ZK	4	2P+0C+2L	*	Ρ
E131002	Engineering Design II Martin Dub	Z,ZK	4	2P+3C	2	Р
E133013	Engineering Design III. František Lopot, Jan Hoidekr Jan Hoidekr Jan Hoidekr (Gar.)	Z	2	0P+2C	*	Р
E133014	Engineering Design IV. František Lopot, Jan Hoidekr Jan Hoidekr (Gar.)	Z	2	0P+2C+0L	*	Р
E153005	Fundamentals of Energy Conversions	Z	1	1P+1C	*	Р
E131512	Machine Elements and Mechanisms I. František Lopot	Z,ZK	6	3P+2C	*	Ρ
E381054	Management and Economics of the Enterprise Michal Kavan Michal Kavan Michal Kavan (Gar.)	Z,ZK	4	2P+2C	*	Р
E322029	Materials Science I. Jakub Horník, Veronika Mazá ová Jakub Horník Jakub Horník (Gar.)	KZ	3	2P+0C+1L	_ L	Р
E321039	Materials Science II. Jakub Horník, Veronika Mazá ová, Jana Sobotová Jakub Horník Jakub Horník (Gar.)	Z,ZK	4	2P+2L	*	Р
E011056	Mathematics I.	Z,ZK	8	4P+4C	Z	Р

E011062	Mathematics II Stanislav Kra mar	Z,ZK	8	4P+4C	*	Р
E011009	Mathematics III. Olga Majlingová, Stanislav Kra mar Stanislav Kra mar (Gar.)	Z,ZK	5	2P+2C	*	Р
E372083	Measurement in Engineering Martin Novák Martin Novák Martin Novák (Gar.)	KZ	3	1P+0C+2L	*	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
E311102	Mechanics II. Pavel Basti, 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
E181026	Momentum, Heat and Mass Transfer Martin Dostál, Vojt ch B lohlav Martin Dostál Martin Dostál (Gar.)	Z,ZK	5	3P+1C	*	Р
E011049	Numerical Mathematics Petr Svá ek, Marta ertíková, David Trdli ka, Jan Karel <b>Petr Svá ek</b> Petr Svá ek (Gar.)	Z,ZK	4	2P+2C	*	Р
E021041	Physics I.	Z,ZK	7	4P+1C	*	Р
E021025	Physics II.	Z,ZK	4	1P+2C	*	Р
E331068	Technology I.	Z,ZK	5	2P+2C	*	Р
E341014	Technology II.	Z.ZK	5	2P+2L	*	Р
pro i od 1 do 6         E012035       A         Programming in MATLAB a         Writting M-script. Input and and functions. Structure of simple programs: minimum         E371047       A         Automatic controllers are in like transfer functions, oper	Igorithmization and Programming and its programming language. MATLAB command line. Elementary commands, variable I output. Condition and cycle. Algorithmization of simple problems in MATLAB. Graphical program. Variables, expressions, assignment, and input / output commands. switch. For a, mean, norm, numerical integration, bisection method, Newton method, matrix operation utomatic Control mportant part of many industrial processes. The goal of this course is to introduce studer in versus closed loop control, design of controllers and frequency based analysis of control ntrollers. Some seminaries are arranged in laboratories where practical skills and control	, assignment and commands. Mati cycle. Arrays and ns. Direct method nts into basic kno I systems. The co	d expression rix operation d files. Point ds for solut wledge of ourse also o	on. Matrices, v ons. Systems of ters. Structure tion of systems Z automatic con concentrates of	KZ        ectors and control        of linear equation        ess. Algorithm        s of linear equation        ZK        utrol theory at the optic control	4 apperations. ations. Scrip ization of quations. 5 and practice rol and contri
	nmon platform of control engineers (MATLAB is used on all including most of the laborat	ory classes).			/7	
General chemistry from the	hemistry e point of view of mechanical and process engineering. Physical chemistry forms 2/3 of the al reactions, reaction engineering), the remaining 1/3 is devoted to organic chemistry (hy properties measurement.			operties of ma		
E012037 C	omputer Graphics				۲Z	3
,	the mathematical theory of the curves and surfaces in computer graphics and their visua	lisation. The Rhir	noceros - N	NURBS model	ling for Wind	lows is use
o demonstrate the geomet	trical properties of the curves and surfaces.					

E372041	Computer Support for Study	KZ	3				
The course introduces students into creating technical and professional documents on computers or Web and into realizing technical computations with the use of computers. Students							
gain practical skills by creating an essay in a text editor, by realizing technical computations with a spreadsheet calculator, and by creating and presenting a web page.							
E011021	Constructive Geometry	Z,ZK	6				
The subject is focused on geometric objects in the space - curves, surfaces and solids and their properties and mutual relations.							
E141504	Electrical 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. Using Sy	mbolic-Complex				
method and Fourier tran	nsformation for analysis AC circuits supplied with harmonic signal. EI. Power and Energy. Introduction into electronics. Princip	le and typical para	ameters of basic				
semiconductor compon	ents. Application in electronic circuits (rectifier, stabilizer, power control, operational amplifier). Analogue and digital circuits. F	rinciple of analog	ue and digital				
signal processing. Logic	al circuits, converters, microprocessor.						
E141505	Electrical Machines and Drives	Z,ZK	4				
AC el. curcuits. Electrica	al power and energy. Calculation, measurement, power factor. Magnetic circuit, materials, hysteresis loop. Electromagnet. Tra	nsformer, principle	e, construction,				
3-phase transformer, op	perating conditions, rated (scheduled) values. Induction machine, principle, construction, operating conditions. Starting, speec	I-torque character	ristic, speed				
control. Synchronous m	achines. DC-machines, principle, parameters, operating conditions, construction, starting, speed control, speed-torque chara	cteristic. Low-volta	age instruments.				
Low-voltage distribution	Low-voltage distribution system.						
E131002	Engineering Design II	7 7K	4				

#### |Engineering Design II E131002

Z,ZK Theoretical fundamentals of GPS (Geometrical Product 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. Ζ 2

E133013 Engineering Design III. E133014 Engineering Design IV.

Ζ 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.

E153005 Fundamentals of Energy Conversions	Z	1
The subject FEC clarify the reasons, procedures and consequences of energy conversions from sources to applications. 1. Introduction. Ene	rgy, forms and transforma	ations of energy.
Structure of primary sources to cover world energy consumption. World reserves, advances and depletion of primary energy sources. Situation	on on the World, EU and C	Czechia 2. Fossil
fuels, their types and properties. Secondary fuels. Combustion of fossil fuels. Combustion equipment and their efficiency. Ecological consequ		
Thermal cycles. Carnot's comparison cycle. Thermal efficiency. 4. Rankine steam cycle, thermal and real efficiency. Steam circulation carnotization carnotizat	=	-
cycle, application. Internal heat transfer, carnotization, thermal and real efficiency. Combine cycle power plant. 6. Cooling cycles, heat pumps		
fluid, efficiency x CoF. 7. Engines with internal combustion (Otto, Diesel, Atkinson, Miller, etc), Stirling cycle, Family of Kalina cycles. 8. Renew	vable sources, application	n, importance,
problems). Direct transformation (heat->Electr.). Special applications.	771	
E131512 Machine Elements and Mechanisms I.		6
Joints and joining elements (screwed, clamped, splined, welded, riveted, soldered and adhesive joints; joints with use of feathers, pins, tenons (belt, chain, friction, gear drives). Seminars are devoted to practical individual solution of simple design projects - tasks with motion screws, p		
pressed, splined and key joints between shafts and hubs and tasks with welded and riveted joints. Sketching of machine elements and their si	-	-
seminar work. Supporting systemes, mechanical joints, material joints, joining elements, mechanical transmissions, dimensioning, loading ca		
E381054 Management and Economics of the Enterprise	Z.ZK	4
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	1 7 1	-
educated foreign students with the basic procedures, methodologies and practice of management and economics of a modern, especially eng		-
both the areas of finance, marketing and operational-production management and economics. The focus is on a prosperous enterprise operational		-
Sigma and Industry 4.0. In addition to lectures and exercises, students also learn to be independent in their individual presentations, dedicate	ed to the assigned profes	sional topics of
advanced business management.		
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 defe	cts, deformation, recrysta	Ilization and
fracture of materials, structure and properties of materials and their testing, fundamentals of thermodynamics, phases and phase transformation	tions, iron-carbon phase	diagram.
E321039 Materials Science II.	Z,ZK	4
Fundamentals of metallurgy, iron-carbon alloys and influence of other elements, phase transformations, thermal, combined chemical and the	rmal and thermo-mechar	ical processing,
technical iron-carbon alloys, non-ferrous metals and their alloys, plastics, structural ceramics, composites, selection of materials.		
E011056 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 cor	ncepts. Students
will also get to know the procedures for solving problems with parametric input. In addition, students will gain extended knowledge in some thema	atic areas: eigennumbers a	and eigenvectors
of a matrix, Taylor polynomial, integral as a limit function, integration of some special functions.		
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 (=tripl	, .	
of integrals to polar, cylindrical and spherical coordinates. A simple smooth curve and line integral of a scalar and vector function. Circulation		
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	a surface. The
Gauss-Ostrogradskij theorem.		
E011009 Mathematics III.	Z,ZK	5
E011009 Mathematics III. An introductory course in ordinary differential equation and infinite series.	· · ·	
E011009       Mathematics III.         An introductory course in ordinary differential equation and infinite series.       E372083         Measurement in Engineering       Measurement in Engineering	KZ	3
E011009       Mathematics III.         An introductory course in ordinary differential equation and infinite series.       E372083         E372083       Measurement in Engineering         Overview of sensor principles for measurement of non-electrical variables (temperature, position, force, speed, acceleration, torque). Calibration	KZ	3
E011009       Mathematics III.         An introductory course in ordinary differential equation and infinite series.       E372083         E372083       Measurement in Engineering         Overview of sensor principles for measurement of non-electrical variables (temperature, position, force, speed, acceleration, torque). Calibra instruments.	tion and verification of me	3 easurement
E011009       Mathematics III.         An introductory course in ordinary differential equation and infinite series.         E372083       Measurement in Engineering         Overview of sensor principles for measurement of non-electrical variables (temperature, position, force, speed, acceleration, torque). Calibra instruments.         E311101       Mechanics I.	tion and verification of me	3 easurement 4
E011009       Mathematics III.         An introductory course in ordinary differential equation and infinite series.         E372083       Measurement in Engineering         Overview of sensor principles for measurement of non-electrical variables (temperature, position, force, speed, acceleration, torque). Calibra instruments.         E311101       Mechanics I.         Modeling of mechanical systems. Determination of force. Constraints and equilibrium of a point. Moment and Torque. Body constraints in 2D.	tion and verification of me Z,ZK Replacement and balance	3 easurement 4 e of general
E011009       Mathematics III.         An introductory course in ordinary differential equation and infinite series.         E372083       Measurement in Engineering         Overview of sensor principles for measurement of non-electrical variables (temperature, position, force, speed, acceleration, torque). Calibra instruments.         E311101       Mechanics I.         Modeling of mechanical systems. Determination of force. Constraints and equilibrium of a point. Moment and Torque. Body constraints in 2D.         planar system of forces. The balance of the body in the plane - numerically. Body constraints in 3D. Replacement and general spatial equilibrium	tion and verification of me Z,ZK Replacement and balance ium of a system of forces	3 easurement 4 e of general The balance
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E011009       Mathematics III.         An introductory course in ordinary differential equation and infinite series.         E372083       Measurement in Engineering         Overview of sensor principles for measurement of non-electrical variables (temperature, position, force, speed, acceleration, torque). Calibra instruments.         E311101       Mechanics I.         Modeling of mechanical systems. Determination of force. Constraints and equilibrium of a point. Moment and Torque. Body constraints in 2D.         planar system of forces. The balance of the body in the plane - numerically. Body constraints in 3D. Replacement and general spatial equilibri of the body in 3D. MBS - Multi Body Systems. Static determinancy and mobility, composition. Analytical solution of equilibrium position.         E311102       Mechanics II.	KZ tion and verification of me Z,ZK Replacement and balance ium of a system of forces ms. Truss systems. Cente Z,ZK	3 easurement 4 re of general . The balance r of gravity. 4
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E011009       Mathematics III.         An introductory course in ordinary differential equation and infinite series.         E372083       Measurement in Engineering         Overview of sensor principles for measurement of non-electrical variables (temperature, position, force, speed, acceleration, torque). Calibra instruments.         E311101       Mechanics I.         Modeling of mechanical systems. Determination of force. Constraints and equilibrium of a point. Moment and Torque. Body constraints in 2D. planar system of forces. The balance of the body in the plane - numerically. Body constraints in 3D. Replacement and general spatial equilibri of the body in 3D. MBS - Multi Body Systems. Static determinancy and mobility, composition. Analytical solution of equilibrium position.         E311102       Mechanics II.         Kinematics of point and of rigid bodies. Transformation matrix. Kinematics of concurrent movements. Motion: translation, rotation, general planar general spatial motion. Composition of mechanisms. Basic planar mechanisms. Analytical methods in kinematics of mechanisms - Trigonomet	KZ tion and verification of me Z,ZK Replacement and balance ium of a system of forces ms. Truss systems. Cente Z,ZK ar motion, spherical motio	3 easurement 4 e of general . The balance r of gravity. 4 n, screw motion,
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E011009       Mathematics III.         An introductory course in ordinary differential equation and infinite series.         E372083       Measurement in Engineering         Overview of sensor principles for measurement of non-electrical variables (temperature, position, force, speed, acceleration, torque). Calibra instruments.         E311101       Mechanics I.         Modeling of mechanical systems. Determination of force. Constraints and equilibrium of a point. Moment and Torque. Body constraints in 2D. planar system of forces. The balance of the body in the plane - numerically. Body constraints in 3D. Replacement and general spatial equilibri of the body in 3D. MBS - Multi Body Systems. Static determinancy and mobility, composition. Analytical solution of equilibrium for MBS systel 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 plana general spatial motion. Composition of mechanisms. Basic planar mechanisms. Analytical methods in kinematics of mechanisms - Trigonomet in kinematics. Basic theory of gearing. Transmition mechanisms with geers. Strutting and seezing in mechanisms. Cable mechanisms.         E181026       Momentum, Heat and Mass Transfer         Fundamentals of transport phenomena balances in homogeneous fluids. Navier-Stokes equations. Momentum transport in turbulent flows. M time distributions in continuous systems. Conduction heat transfer. Forced and natural convection heat transfer. Heat transfer with phase change sys	KZ tion and verification of me Z,ZK Replacement and balance ium of a system of forces ms. Truss systems. Cente Z,ZK ar motion, spherical motio ric and vector method. Gra Z,ZK lechanical energy equatio ues and thermal radiation.	3 easurement 4 e of general The balance r of gravity. 4 n, screw motion, aphical methods 5 n. Residence Multicomponent
E011009       Mathematics III.         An introductory course in ordinary differential equation and infinite series.         E372083       Measurement in Engineering         Overview of sensor principles for measurement of non-electrical variables (temperature, position, force, speed, acceleration, torque). Calibra instruments.         E311101       Mechanics I.         Modeling of mechanical systems. Determination of force. Constraints and equilibrium of a point. Moment and Torque. Body constraints in 2D. planar system of forces. The balance of the body in the plane - numerically. Body constraints in 3D. Replacement and general spatial equilibrium for MBS system. Static determinancy and mobility, composition. Analytical solution of equilibrium for MBS system 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 general spatial motion. Composition of mechanisms. Basic planar mechanisms. Analytical methods in kinematics of mechanisms - Trigonomet in kinematics. Basic theory of gearing. Transmition mechanisms with geers. Strutting and seezing in mechanisms. Cable mechanisms.         E181026       Momentum, Heat and Mass Transfer         Fundamentals of transport phenomena balances in homogeneous fluids. Navier-Stokes equations. Momentum transport in turbulent flows. M time distributions in continuous systems. Conduction heat transfer. Forced and natural convection heat transfer. Heat transfer with phase chang systems. Mass transfer by mole	KZ tion and verification of me Z,ZK Replacement and balance ium of a system of forces ms. Truss systems. Cente Z,ZK ar motion, spherical motio ric and vector method. Gra Z,ZK lechanical energy equatio les and thermal radiation.	3 easurement 4 e of general . The balance r of gravity. 4 n, screw motion, aphical methods 5 n. Residence Multicomponent 4
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E011009       Mathematics III.         An introductory course in ordinary differential equation and infinite series.         E372083       Measurement in Engineering         Overview of sensor principles for measurement of non-electrical variables (temperature, position, force, speed, acceleration, torque). Calibra instruments.         E311101       Mechanics I.         Modeling of mechanical systems. Determination of force. Constraints and equilibrium of a point. Moment and Torque. Body constraints in 2D. planar system of forces. The balance of the body in the plane - numerically. Body constraints in 3D. Replacement and general spatial equilibr of the body in 3D. MBS - Multi Body Systems. Static determinancy and mobility, composition. Analytical solution of equilibrium for MBS system 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 general spatial motion. Composition of mechanisms. Basic planar mechanisms. Analytical methods in kinematics of mechanisms - Trigonomet in kinematics. Basic theory of gearing. Transmition mechanisms with geers. Strutting and seezing in mechanisms. Cable mechanisms.         E181026       Momentum, Heat and Mass Transfer         Fundamentals of transport phenomena balances in homogeneous fluids. Navier-Stokes equations. Momentum transport in turbulent flows. M time distributions in continuous systems. Conduction heat transfer. Forced and natural convection heat transfer. Heat transfer with phase chang syst	KZ         tion and verification of me         Z,ZK         Replacement and balance         ium of a system of forces         ms. Truss systems. Cente         Z,ZK         ar motion, spherical motio         ric and vector method. Gra         Z,ZK         lechanical energy equation         Z,ZK         Z,ZK         Icechanical energy equation         Z,ZK         Icechanical energy equation         Icechanical energy e	3 easurement 4 e of general The balance r of gravity. 4 n, screw motion, aphical methods 5 n. Residence Multicomponent 4 7 ies. Oscillations, nductors,
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Code of the group: 12B\*A\*P-ZT12 Name of the group: 03 2012 anglicky ZT v po adí 12

#### Requirement credits in the group: In this group you have to gain 6 credits Requirement courses in the group: In this group you have to complete 2 courses Credits in the group: 6 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
E333038	Fundamentals of Technology I.	Z	3	1P+1C	*	Р

#### Characteristics of the courses of this group of Study Plan: Code=12B\*A\*P-ZT12 Name=03 2012 anglicky ZT v po adí 12

E333038 Fundamentals of Technology I.

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.

3

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7.7K

6

#### Code of the group: 12B\*A\*P-TV

Name of the group: 04 2012 bakalá ský povinný t locvik anglicky Requirement credits in the group: In this group you have to gain 3 credits Requirement courses in the group: In this group you have to complete 3 courses Credits in the group: 3 Note on the group:

Code of the group: 12BSA5P-ME3 Name of the group: 07 2012 ME3 pro STR anglicky Requirement credits in the group: In this group you have to gain 6 credits Requirement courses in the group: In this group you have to complete 1 course Credits in the group: 6 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
E311108	Mechanics III. Tomáš Vampola	Z,ZK	6	2P+2C	*	Р

#### Characteristics of the courses of this group of Study Plan: Code=12BSA5P-ME3 Name=07 2012 ME3 pro STR anglicky

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.

#### Code of the group: 12BSA6P-CMS2

Name of the group: 08 2012 CMS2 pro STR anglicky

Requirement credits in the group: In this group you have to gain at least 77 credits (at most 2) Requirement courses in the group: In this group you have to complete at least 2 courses Credits in the group: 77

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
E133025	Design František Lopot, Daniel Hadraba <b>František Lopot</b> František Lopot (Gar.)	Z	4	0P+4C	*	Р
E131026	Machine Elements and Mechanisms II. František Lopot, Daniel Hadraba <b>František Lopot</b> František Lopot (Gar.)	ZK	3	3P+0C+0L	*	Р

#### Characteristics of the courses of this group of Study Plan: Code=12BSA6P-CMS2 Name=08 2012 CMS2 pro STR anglicky

E133025	Design	Z	4					
Design, design calculations and their aplications in case of geared transmissions, axles and shafts, sliding and rolling bearings, shaft couplings and clutches.								
E131026	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.								

#### Name of the block: Compulsory elective courses

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:

	g. cap.					
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 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 bakalá ské zkoušky z jazyk anglicky

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 discussion to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.							
to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.							
to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.							
2041066Czech - Bachelor ExamZK2							
Mapped to the Common European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulties, to take part in discussions							
to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.							
2041063 French - Bachelor Exam /FME Z,ZK 2							
Mapped to the Common European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulties, to take part in discussion							
to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.							
2041062 German - Bachelor Exam / FME Z,ZK 2							
Mapped to the Common European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulties, to take part in discussion							
to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.							
2041065 Russian - Bachelor Exam / FME Z,ZK 2							
Mapped to the Common European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulties, to take part in discussion							
to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.							
2041064 Spanish - Bachelor Exam / FME Z,ZK 2							
Mapped to the Common European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulties, to take part in discussions,							
to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.							

#### Code of the group: 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

E362091	Project	KZ	2		
E372091	Project	KZ	2		
An individual project from the branch of specialization (instrumentation, control engineering, informatics), or individual work, related to another subject.					
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	t 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 cor	responding 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	-school knowledg	e) necessary for
successful finishing Phy	vsics II course. The instructions are analogical to seminars with a short corresponding theoretical background. The link betwee	en physical concer	pts and methods
of solution of typical pro	blems 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 <b>Petr Laurich</b>	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 spok	en language as well as lectures in Czech on topics familiar to the student. Communication with native speakers, participation in	discussions. Exp	ressing opinions.
Written skills. Ability to	write an essay or a report. Reading and understanding texts concerning currant issues and popular scientific and technical a	rticles.	
E046125	Czech - 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	m. Writing in a sir	nple way about
familiar topics. Reading	and comprehension of simple texts. Improvement of professional language.		
E046128	Czech - Upper Intermediate	Z	2
Mapped to the Common	n European Framework of Reference Level A2-B1. The aim is to extend language skills taking into consideration professional	Czech and comm	non professional
terminology. Comprehe	nsion of standard Czech speech and conversation about topics of everyday life - at school, at work, during free time, on inter	mediate level. Bro	adening the
knowledge technical lar	nguage.		
E046118	Czech Advanced	Z	2
Mapped to the level of 0	common European Framework of Reference: B1- B2 The aim: comprehension of spoken Czech as well as lectures given in C	zech without grea	at 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 comprehen	sion of popular-so	cientific and
scientific articles or text	s from student's field of studies without difficulties. Grammar structures on advanced level.		
E046120	Czech for Beginners II.	Z	2
Mapped to the Common	n European Framework of Reference Level A1 Aim: Basic vocabulary of everyday life in a written and spoken form. Understan	ding and use of b	asic expressions
of general scientific terr	ninology (professional language).		
E046119	Czech Language for Beginners I.	Z	2
Basic vocabulary of eve	ryday life in a spoken and written form. Understanding and use of basic expressions of general scientific terminology (profes	sional language)	•

	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 which	a student meets a	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 lar	nguage.
E046127	Czech Upper Intermediate	Z	2
Understanding stand	lard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Abil	lity 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 the	em. Writing in a sir	mple way about
familiar topics. Read	ng and comprehension of simple texts. Improvement of professional language.		
E046079	German Lower Intermediate	Z	2
Mapped to the level	of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations whic	ch a student meets	s either at schoo
or in his/her free time	e and speaking about them. Writing in a simple way about familiar topics. reading and comprehesion of simple texts. Improveme	ent of professional	language.
E046080	German Upper Intermediate	Z	2
Understanding stand	lard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Abil	lity to describe exp	eroences and
events, briefly explai	n one's opinions and plans.		
E046081	German Upper Intermediate	Z	2
Mapped to the level	of Common European Framework of Reference:A2 - B1 Understanding standard speech about familiar topics, that a students c	comes across at w	ork, at school,
during free time, and	talking about these topics. Ability to describe experiences and events, explain one's opinions and plans. Reading and understa	anding general an	d technical texts
=			
E046082	German Advanced	Z	2
	German Advanced German Advanced boken language as well as lectures in German on topics familiar to the student. Communication with native speakers, participat	-	-
Comprehension of s		tion in discussions	-
Comprehension of s	poken language as well as lectures in German on topics familiar to the student. Communication with native speakers, participat	tion in discussions	-
Comprehension of s opinions. Written skil E046083	booken language as well as lectures in German on topics familiar to the student. Communication with native speakers, participat Is. Ability to write an essay or a report. Reading and understanding texts concerning currant issues and popular scientific and to	tion in discussions echnical articles.	Expressing
Comprehension of s opinions. Written skil E046083 Mapped to the level	booken language as well as lectures in German on topics familiar to the student. Communication with native speakers, participat Is. Ability to write an essay or a report. Reading and understanding texts concerning currant issues and popular scientific and te German Advanced	tion in discussions echnical articles.	Expressing
Comprehension of s opinions. Written skil E046083 Mapped to the level and active participati	booken language as well as lectures in German on topics familiar to the student. Communication with native speakers, participat Is. 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 i	tion in discussions echnical articles.	Expressing
Comprehension of s opinions. Written skil E046083 Mapped to the level and active participati scientific articles or t	booken language as well as lectures in German on topics familiar to the student. Communication with native speakers, participat Is. 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 i on in a discussion. Written and oral skills on advanced level. Ability to write a summary, a report, an essay. Reading and compr	tion in discussions echnical articles.	Expressing
Comprehension of s opinions. Written skil E046083 Mapped to the level and active participati	booken language as well as lectures in German on topics familiar to the student. Communication with native speakers, participat Is. 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 i on in a discussion. Written and oral skills on advanced level. Ability to write a summary, a report, an essay. Reading and compr	tion in discussions echnical articles. Z in German without rehension of popul	Expressing

# List of courses of this pass:

	Name of the course	Completion	Credits
2041061	English-Bachelor Exam	Z,ZK	2
Mapped to the Commo	on European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulti to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.	ies, to take part in d	discussions,
2041062	German - Bachelor Exam / FME	Z,ZK	2
Mapped to the Commo	on European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulti to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.	ies, to take part in d	discussions,
2041063	French - Bachelor Exam /FME	Z,ZK	2
Mapped to the Commo	on European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulti 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	discussions,
2041064	Spanish - Bachelor Exam / FME	Z,ZK	2
Mapped to the Commo	on European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulti to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.	ies, to take part in d	discussions,
2041065	Russian - Bachelor Exam / FME	Z,ZK	2
Mapped to the Commo	on European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulti 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	discussions,
2041066	Czech - Bachelor Exam	ZK	2
	Czech - Bachelor Exam on European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulti to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.	1	_
	on European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulti	1	_
Mapped to the Commo	on European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulti 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	discussions,
Mapped to the Commo	on European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulti to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level. Mathematics III.	ies, to take part in o	discussions,
Mapped to the Commo	on 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. Mathematics III. An introductory course in ordinary differential equation and infinite series.	Z,ZK	discussions,
Mapped to the Commo	on European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulti to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level. Mathematics III. An introductory course in ordinary differential equation and infinite series. Constructive Geometry	Z,ZK	discussions,
Mapped to the Common E011009 E011021	on 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. Mathematics III. An introductory course in ordinary differential equation and infinite series. Constructive Geometry The subject is focused on geometric objects in the space - curves, surfaces and solids and their properties and mutual relatio Numerical Mathematics	ies, to take part in o Z,ZK Z,ZK ns. Z,ZK	discussions, 5 6
Mapped to the Common           E011009           E011021           E011049           E011056	on 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. Mathematics III. An introductory course in ordinary differential equation and infinite series. Constructive Geometry The subject is focused on geometric objects in the space - curves, surfaces and solids and their properties and mutual relatio	Z,ZK Z,ZK Z,ZK Z,ZK Z,ZK Z,ZK	discussions, 5 6 4 8
Mapped to the Common E011009 E011021 E011049 E011056 In the course, greater	on 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. Mathematics III. An introductory course in ordinary differential equation and infinite series. Constructive Geometry The subject is focused on geometric objects in the space - curves, surfaces and solids and their properties and mutual relatio Numerical Mathematics Mathematics I.	Z,ZK Z,ZK Z,ZK S between concep	5 6 4 s. Students
Mapped to the Common E011009 E011021 E011049 E011056 In the course, greater	on 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. Mathematics III. An introductory course in ordinary differential equation and infinite series. Constructive Geometry The subject is focused on geometric objects in the space - curves, surfaces and solids and their properties and mutual relatio Numerical Mathematics I. emphasis is placed on the theoretical basis of the concepts discussed and on the derivation of basic relationships and connections the procedures for solving problems with parametric input. In addition, students will gain extended knowledge in some thematic areas: ei	Z,ZK Z,ZK Z,ZK S between concep	5 6 4 s. Students

Programming in	Algorithmization and Programming	KZ	4
i rogramming m	MATLAB and its programming language. MATLAB command line. Elementary commands, variable, assignment and expression. Matri	ces, vectors and or	perations.
	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
I he subject is foc	used on the mathematical theory of the curves and surfaces in computer graphics and their visualisation. The Rhinoceros - NURBS n	nodelling for Windo	ws is used
5004005	to demonstrate the geometrical properties of the curves and surfaces.	7 71/	4
E021025	Physics II. ectromagnetic induction. Maxwell's equations, electromagnetic waves. Light, wave optics, geometrical optics. Quantum properties of elec		4
	natter. 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 experi		
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	· · ·	/ Oscillations
	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		
	measurements, regression, measurements of 11 various experiments related to the lectures.	,	
E026002	Physics I Seminary	Z	2
_0_000	Solving of problems corresponding to the lectures of Physics I.	· – I	-
E026003	Physics II Seminary	Z	2
	nded for students who need more detailed practising and improvement (including knowledge from former physics courses, or high-sch		
	Physics II course. The instructions are analogical to seminars with a short corresponding theoretical background. The link between p	• •	
	of solution of typical problems is underlying.		
E046076		Z	2
E046077	German Beginners	7	2
	pommon European Framework of Reference level A1. Basic vocabulary of everyday lifein a written and spoken form. understanding and		
mapped to the et	general scientific terminology.		
E046078	German - Lower Intermediate Course	Z	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.	tritang in a simple	hay about
E046079	German Lower Intermediate	Z	2
	I of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations which a	–	
	e time and speaking about them. Writing in a simple way about familiar topics, reading and comprehesion of simple texts. Improvemen		
E046080	German Upper Intermediate	7	2
	andard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ability	to describe experor	_
<b>J</b>	events, briefly explain one's opinions and plans.		
E046081	German Upper Intermediate	Z	2
	rel of Common European Framework of Reference:A2 - B1 Understanding standard speech about familiar topics, that a students com		
during free time, a	nd talking about these topics. Ability to describe experiences and events, explain one's opinions and plans. Reading and understandir	ng general and tech	hnical texts.
E046082	German Advanced	Z	2
Comprehension	of spoken language as well as lectures in German on topics familiar to the student. Communication with native speakers, participation	n in discussions. E	xpressing
opinions.	Written skills. Ability to write an essay or a report. Reading and understanding texts concerning currant issues and popular scientific a	and technical article	es.
E046083	German Advanced		
Mapped to the leve	el of Common European Framework of Reference: B1- B2 The aim: comprehension of spoken German as well as lectures given in G	L 2	2
and active particip	i el common European n'americane provence. En EE me anni comprenencia el opencin coman de ven de locardo given in ec	۲ rman without grea	
	ation in a discussion. Written and oral skills on advanced level. Ability to write a summary, a report, an essay. Reading and comprehe	-	t difficulties
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E046117	ation in a discussion. Written and oral skills on advanced level. Ability to write a summary, a report, an essay. Reading and comprehen	-	t difficulties
	ation in a discussion. Written and oral skills on advanced level. Ability to write a summary, a report, an essay. Reading and comprehenession scientific articles or texts from student's field of studies without difficulties. Grammar structures on advanced level.	nsion of popular-sc	t difficulties cientific and 2
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E131002	Engineering Design II	Z,ZK	4
Theoretical fundam	entals of GPS (Geometrical Product Specification). Students will get critical knowledge about ISO system of limits and fits, tolerancing	g, surface texture,	geometrical
tolerance, dimen	sional loops, tolerancing of angles and cones, tolerancing of threads. Integral part of course is a project where students apply and pr	actice their knowle	dge from
E404000	lectures.	71/	0
E131026	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, p and fittings.	opelines and their	accessories
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		
	on, gear drives). Seminars are devoted to practical individual solution of simple design projects - tasks with motion screws, preloaded		
	d key joints between shafts and hubs and tasks with welded and riveted joints. Sketching of machine elements and their simple assert	-	
seminar woi	k. Supporting systemes, mechanical joints, material joints, joining elements, mechanical transmissions, dimensioning, loading capac	ity, durability, relial	oility.
E133013	Engineering Design III.	Z	2
E133014	Engineering Design IV.	Z	2
Information about g	eneral principles of a new technical product design, stages of development of a new product, the designer fundamental assignment is		ous 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 exact		
E133025	Design	Z	4
	, design calculations and their aplications in case of geared transmissions, axles and shafts, sliding and rolling bearings, shaft coupli	-	4
E141504	Electrical Circuits and Electronics pory of electrical circuits, analysis special types of electrical circuits as DC and AC. Transient states in circuits with accumulators of end	Z,ZK	4 lia Complex
	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. Print		
	signal processing. Logical circuits, converters, microprocessor.		
E141505	Electrical Machines and Drives	Z,ZK	4
	ctrical power and energy. Calculation, measurement, power factor. Magnetic circuit, materials, hysteresis loop. Electromagnet. Transf	,	onstruction,
3-phase transform	ner, operating conditions, rated (scheduled) values. Induction machine, principle, construction, operating conditions. Starting, speed-	torque characteris	tic, speed
control. Synchronou	is machines. DC-machines, principle, parameters, operating conditions, construction, starting, speed control, speed-torque character	istic. Low-voltage i	nstruments.
	Low-voltage distribution system.		-
E152091	Project	KZ	2
E153005	Fundamentals of Energy Conversions	Z	1
-	arify the reasons, procedures and consequences of energy conversions from sources to applications. 1. Introduction. Energy, forms a		
	y sources to cover world energy consumption. World reserves, advances and depletion of primary energy sources. Situation on the W nd properties. Secondary fuels. Combustion of fossil fuels. Combustion equipment and their efficiency. Ecological consequences of c		
	rnot's comparison cycle. Thermal efficiency. 4. Rankine steam cycle, thermal and real efficiency. Steam circulation carnotization. Surve		
	nternal heat transfer, carnotization. thermal and real efficiency. Combine cycle power plant. 6. Cooling cycles, heat pumps, organic R	-	-
	CoF. 7. Engines with internal combustion (Otto, Diesel, Atkinson, Miller, etc), Stirling cycle, Family of Kalina cycles. 8. Renewable sour		-
	problems). Direct transformation (heat->Electr.). Special applications.		
E153091	Project Presentation	Z	4
E181026	Momentum, Heat and Mass Transfer	Z,ZK	5
	ransport phenomena balances in homogeneous fluids. Navier-Stokes equations. Momentum transport in turbulent flows. Mechanical		
time distributions in	continuous systems. Conduction heat transfer. Forced and natural convection heat transfer. Heat transfer with phase changes and ther	mal radiation. Mult	icomponent
E192010	systems. Mass transfer by molecular diffusion, convection, with chemical reactions and interphase mass transfer.	1/7	2
E182019	Chemistry y from the point of view of mechanical and process engineering. Physical chemistry forms 2/3 of the course (structure and properties	KZ	3 dynamics
	, chemical reactions, reaction engineering), the remaining 1/3 is devoted to organic chemistry (hydrocarbons, polymers) and biocher		-
pildee equilibrium	oriented upon the material properties measurement.		
E182091	Project	1/7	2
		κZ	2
E183091	Absolvent se seznámí se základy oboru Procesní technika.	KZ	2
	Absolvent se seznámí se základy oboru Procesní technika. Project Presentation	Z	4
E311101	Project Presentation		
Modeling of mech	Project Presentation Preparation and presentation of a given project theme. Mechanics I. nanical systems. Determination of force. Constraints and equilibrium of a point. Moment and Torque. Body constraints in 2D. Replacer	Z Z,ZK nent and balance	4 4 of general
Modeling of mech planar system of f	Project Presentation Preparation and presentation of a given project theme. Mechanics I. nanical systems. Determination of force. Constraints and equilibrium of a point. Moment and Torque. Body constraints in 2D. Replacer porces. The balance of the body in the plane - numerically. Body constraints in 3D. Replacement and general spatial equilibrium of a s	Z Z,ZK ment and balance ystem of forces. Th	4 4 of general ne balance
Modeling of mech planar system of f	Project Presentation Preparation and presentation of a given project theme. Mechanics I. nanical systems. Determination of force. Constraints and equilibrium of a point. Moment and Torque. Body constraints in 2D. Replacer orces. The balance of the body in the plane - numerically. Body constraints in 3D. Replacement and general spatial equilibrium of a s MBS - Multi Body Systems. Static determinancy and mobility, composition. Analytical solution of equilibrium for MBS systems. Truss	Z Z,ZK nent and balance ystem of forces. Th s systems. Center	4 4 of general ne balance
Modeling of mech planar system of f of the body in 3D	Project Presentation Preparation and presentation of a given project theme. Mechanics I. nanical systems. Determination of force. Constraints and equilibrium of a point. Moment and Torque. Body constraints in 2D. Replacer orces. The balance of the body in the plane - numerically. Body constraints in 3D. Replacement and general spatial equilibrium of a s NBS - Multi Body Systems. Static determinancy and mobility, composition. Analytical solution of equilibrium for MBS systems. Truss Internal forces. The balance of the body and of multibody systems with friction. Mechanical work. Power. Efficiency. Equilibrium p	Z Z,ZK nent and balance ystem of forces. Th s systems. Center osition.	4 of general ne balance of gravity.
Modeling of mech planar system of f of the body in 3D E311102	Project Presentation Preparation and presentation of a given project theme. Mechanics I. Manical systems. Determination of force. Constraints and equilibrium of a point. Moment and Torque. Body constraints in 2D. Replacer orces. The balance of the body in the plane - numerically. Body constraints in 3D. Replacement and general spatial equilibrium of a s MBS - Multi Body Systems. Static determinancy and mobility, composition. Analytical solution of equilibrium for MBS systems. Truss Internal forces. The balance of the body and of multibody systems with friction. Mechanical work. Power. Efficiency. Equilibrium p Mechanics II.	Z Z,ZK ment and balance ystem of forces. Th s systems. Center osition. Z,ZK	4 of general ne balance of gravity.
Modeling of mech planar system of f of the body in 3E E311102 Kinematics of point	Project Presentation Preparation and presentation of a given project theme. Mechanics I. Manical systems. Determination of force. Constraints and equilibrium of a point. Moment and Torque. Body constraints in 2D. Replacer orces. The balance of the body in the plane - numerically. Body constraints in 3D. Replacement and general spatial equilibrium of a s MBS - Multi Body Systems. Static determinancy and mobility, composition. Analytical solution of equilibrium for MBS systems. Truss Internal forces. The balance of the body and of multibody systems with friction. Mechanical work. Power. Efficiency. Equilibrium pr Mechanics II. and of rigid bodies. Transformation matrix. Kinematics of concurrent movements. Motion: translation, rotation, general planar motion, s	Z Z,ZK ment and balance ystem of forces. Th s systems. Center osition. Z,ZK pherical motion, so	4 of general ne balance of gravity. 4 rew motion,
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E331068	Technology I.	Z,ZK	5
Foundry properties	of metals. Treatment. Pouring. Casting solidification. Moulding and core making. Thermal treatment. Plastic deformation. Division of formi		mi-products
	heating-up. Cutting. Cold and hot forming. Welds. Weldability. Weldment testing. Thermal cutting. Brazing. Surface treatments	3.	
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 three mar	nufacturing techn	ologies such
	as casting, forming and welding, including basic terms, methods and materials.		
E341014	Technology II.	Z,ZK	5
Mechanics of chip	ormation, cutting processes, finishing operations, non-traditional machining processes. Production rates calculation, machining econor	nics. Automation of	f processes
	programming of manufacture. Engineering metrology. Assembly techniques. Introduction to process planing.		
E362091	Project	KZ	2
E363091	Project Presentation	Z	4
E371047	Automatic Control	Z,ZK	5
Automatic control	lers are important part of many industrial processes. The goal of this course is to introduce students into basic knowledge of automativ	c control theory a	nd practice
ike transfer functio	ns, open versus closed loop control, design of controllers and frequency based analysis of control systems. The course also concentration	es on logic contro	and contro
via programmab	le logic controllers. Some seminaries are arranged in laboratories where practical skills and control engineering methods are trained. S	Students begin to	work with
	MATLAB software as a common platform of control engineers (MATLAB is used on all including most of the laboratory classe	s).	
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 th	ne use of compute	ers. Students
gain practio	al skills by creating an essay in a text editor, by realizing technical computations with a spreadsheet calculator, and by creating and pu	resenting a web p	bage.
E372083	Measurement in Engineering	KZ	3
Overview of sen	sor principles for measurement of non-electrical variables (temperature, position, force, speed, acceleration, torque). Calibration and v	erification of mea	asurement
	instruments.		
E372091	Project	KZ	2
An	individual project from the branch of specialization (instrumentation, control engineering, informatics), or individual work, related to an	other subject.	i.
E373091	Project Presentation	Z	4
E373091	Project Presentation project prepared for the subject E372091. Report in pdf format and prepared presentation (MS Powerpoint, Impress) required. Preser	_	1 .
E373091		_	· ·
E373091	project prepared for the subject E372091. Report in pdf format and prepared presentation (MS Powerpoint, Impress) required. Prese	_	1 .
E373091 Presentation of the E381054	project prepared for the subject E372091. Report in pdf format and prepared presentation (MS Powerpoint, Impress) required. Present of another students and their supervisors).	Tation, discussio	n (questions
E373091 Presentation of the E381054 The study subject i	project prepared for the subject E372091. Report in pdf format and prepared presentation (MS Powerpoint, Impress) required. Present of another students and their supervisors). Management and Economics of the Enterprise	ntation, discussic Z,ZK goal is to acquair	n (questions
E373091 Presentation of the E381054 The study subject is educated foreign st	project prepared for the subject E372091. Report in pdf format and prepared presentation (MS Powerpoint, Impress) required. Present of another students and their supervisors).           Management and Economics of the Enterprise           s intended for a wide range of students from all over the world who have successfully studied it for many previous years. The teaching	ntation, discussic Z,ZK goal is to acquain npany. The teach	n (question 4 ht technicall
E373091 Presentation of the E381054 The study subject i educated foreign st both the areas of	project prepared for the subject E372091. Report in pdf format and prepared presentation (MS Powerpoint, Impress) required. Present of another students and their supervisors).           Management and Economics of the Enterprise           s intended for a wide range of students from all over the world who have successfully studied it for many previous years. The teaching rudents with the basic procedures, methodologies and practice of management and economics of a modern, especially engineering corr	ntation, discussion Z,ZK goal is to acquain npany. The teach n the framework of	n (question 4 ht technically ing concerns of Lean Six

For updated information see <u>http://bilakniha.cvut.cz/en/FF.html</u> Generated: day 2025-07-20, time 00:58.