## Study plan

## Name of study plan: 09 54 59 00 BSTR 2012 A - prezenční 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: třetí 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 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
E012035	Algorithmization and Programming	KZ	4	1P+2C	*	Р
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 (Gar.)	KZ	3	2P+1C	*	Р
E012037	Computer Graphics	KZ	3	1P+1C	*	Р
E372041	Computer Support for Study	KZ	3	1P+1C	*	Р
E011021	Constructive Geometry	Z,ZK	6	3P+2C	Z	Р
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  Martin Novák	Z,ZK	4	2P+0C+2L	*	Р
E131002	Engineering Design II	Z,ZK	4	2P+3C	2	Р
E133013	Engineering Design III.  Jan Holdekr, František Lopot Jan Holdekr Jan Holdekr (Gar.)	Z	2	0P+2C	*	Р
E133014	Engineering Design IV.  Jan Hoidekr	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	*	Р
E381054	Management and Economics of the Enterprise	Z,ZK	4	2P+2C	*	Р
E322029	Materials Science I.  Jakub Horník	KZ	3	2P+0C+1L	L	Р
E321039	Materials Science II.  Jakub Horník, Jana Sobotová, Veronika Mazáčová <b>Jakub Horník</b> Jakub Horník (Gar.)	Z,ZK	4	2P+2L	*	Р
E011056	Mathematics I.	Z,ZK	8	4P+4C	Z	Р
E011062	Mathematics II	Z,ZK	8	4P+4C	*	Р
E011009	Mathematics III.	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 Nečas, Zdeněk Neusser, Jan Pelikán, Pavel Steinbauer, Zbyněk Šika, Zbyněk Šika Zbyněk Šika (Gar.)	Z,ZK	4	2P+2C	*	Р
E311102	Mechanics II. Václav Bauma	Z,ZK	4	2P+2C	*	Р
E181026	Momentum, Heat and Mass Transfer	Z,ZK	5	3P+1C	*	Р
E011049	Numerical Mathematics	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

2011011	recimology ii.		
Characteristics o	f the courses of this group of Study Plan: Code=12B-KMENATZI STR Name=01 2012 souhr	n skupin 12E	3*AiP-KMEN
E012035	Algorithmization and Programming	KZ	4
	AB and its programming language. MATLAB command line. Elementary commands, variable, assignment and expression. Ma	ı trices. vectors an	d operations.
	and output. Condition and cycle. Algorithmization of simple problems in MATLAB. Graphical commands. Matrix operations. Sy		•
1	e of program. Variables, expressions, assignment, and input / output commands. switch. For cycle. Arrays and files. Pointers. S		
	num, mean, norm, numerical integration, bisection method, Newton method, matrix operations. Direct methods for solution of	_	
E371047	Automatic Control	Z,ZK	5
	are important part of many industrial processes. The goal of this course is to introduce students into basic knowledge of autom		l .
	open versus closed loop control, design of controllers and frequency based analysis of control systems. The course also conce		
	c controllers. Some seminaries are arranged in laboratories where practical skills and control engineering methods are trained	_	
	common platform of control engineers (MATLAB is used on all including most of the laboratory classes).	i. Otadonio bogin	to work with
E182019		KZ	3
	Chemistry		1
-	n the point of view of mechanical and process engineering. Physical chemistry forms 2/3 of the course (structure and propertic		-
1	mical reactions, reaction engineering), the remaining 1/3 is devoted to organic chemistry (hydrocarbons, polymers) and bioch	emistry. Laborato	ry practice is
	erial properties measurement.	1/7	
E012037	Computer Graphics	KZ	3
1	on the mathematical theory of the curves and surfaces in computer graphics and their visualisation. The Rhinoceros - NURBS	S modelling for W	indows is used
	ometrical 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 w	ith the use of com	puters. Students
gain practical skills by	creating an essay in a text editor, by realizing technical computations with a spreadsheet calculator, and by creating and pres	enting a web page	e.
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
	of electrical circuits, analysis special types of electrical circuits as DC and AC. Transient states in circuits with accumulators of	i f energy. Using Sy	mbolic-Complex
method and Fourier tra	ansformation for analysis AC circuits supplied with harmonic signal. El. Power and Energy. Introduction into electronics. Princip	le and typical par	ameters of basic
	nents. Application in electronic circuits (rectifier, stabilizer, power control, operational amplifier). Analogue and digital circuits. F		
signal processing. Logi	ical circuits, converters, microprocessor.		
E141505	Electrical Machines and Drives	Z,ZK	4
	cal power and energy. Calculation, measurement, power factor. Magnetic circuit, materials, hysteresis loop. Electromagnet. Tra		
	perating conditions, rated (scheduled) values. Induction machine, principle, construction, operating conditions. Starting, speed		
·	nachines. DC-machines, principle, parameters, operating conditions, construction, starting, speed control, speed-torque chara	-	
Low-voltage distribution			
E131002	Engineering Design II	Z.ZK	4
	als of GPS (Geometrical Product Specification). Students will get critical knowledge about ISO system of limits and fits, tolerar	,	· ·
	loops, tolerancing of angles and cones, tolerancing of threads. Integral part of course is a project where students apply and p	-	_
lectures.	topo, totalianing or angion and contest, coordinating or announced model to a project whole discounce apply and p	radioo troii itroi	moago nom
E133013	Engineering Design III.	Z	2
E133014	Engineering Design IV.	Z	2
1	eral principles of a new technical product design, stages of development of a new product, the designer fundamental assignment	nt is to propose a	rivalrous product
	a dribling jig. A drilling jig is a device by means of which holes on many duplicate parts may be drilled exactly alike.		1
E153005	Fundamentals of Energy Conversions	Z	1
	y the reasons, procedures and consequences of energy conversions from sources to applications. 1. Introduction. Energy, forr		
Structure of primary so	ources to cover world energy consumption. World reserves, advances and depletion of primary energy sources. Situation on th	e World, EU and	Czechia 2. Fossil
fuels, their types and p	roperties. Secondary fuels. Combustion of fossil fuels. Combustion equipment and their efficiency. Ecological consequences or	of combustion. 3. I	i. and II. TD law.
•	t's comparison cycle. Thermal efficiency. 4. Rankine steam cycle, thermal and real efficiency. Steam circulation carnotization. St	•	•
*	rnal heat transfer, carnotization. thermal and real efficiency. Combine cycle power plant. 6. Cooling cycles, heat pumps, organi	•	
	7. Engines with internal combustion (Otto, Diesel, Atkinson, Miller, etc), Stirling cycle, Family of Kalina cycles. 8. Renewable so	ources, applicatio	n, importance,
problems). Direct trans	formation (heat->Electr.). Special applications.		
E131512	Machine Elements and Mechanisms I.	Z,ZK	6
Joints and joining elem	ients (screwed, clamped, splined, welded, riveted, soldered and adhesive joints; joints with use of feathers, pins, tenons, cotters	s, keys). Mechanio	cal transmissions
(belt, chain, friction, ge	ar drives). Seminars are devoted to practical individual solution of simple design projects - tasks with motion screws, preloader	ed connecting bol	ts, clamped,
pressed, splined and ke	ey joints between shafts and hubs and tasks with welded and riveted joints. Sketching of machine elements and their simple as	sembly units is al	so indispensable
seminar work. Support	ing systemes, mechanical joints, material joints, joining elements, mechanical transmissions, dimensioning, loading capacity,	durability, reliabili	ty.

E381054 Management and Economics of	the Enterprise	Z.ZK	4
1 0	over the world who have successfully studied it for many previous years. The teach	, i	uaint technically
	s and practice of management and economics of a modern, especially engineering		- 1
	anagement and economics. The focus is on a prosperous enterprise operating with		-
- · · · · · · · · · · · · · · · · · · ·	ents also learn to be independent in their individual presentations, dedicated to the		
advanced business management.		3 p	
E322029 Materials Science I.		KZ	3
· ·	ا hnical materials, internal structure of metals, crystal lattices and their defects, defo	rmation, recrysta	-
fracture of materials, structure and properties of materials and their	r testing, fundamentals of thermodynamics, phases and phase transformations, iro	n-carbon phase (	diagram.
E321039 Materials Science II.		Z,ZK	4
I .	ner elements, phase transformations, thermal, combined chemical and thermal and	, i	ical processing,
technical iron-carbon alloys, non-ferrous metals and their alloys, pl	astics, structural ceramics, composites, selection of materials.		
E011056 Mathematics I.		Z,ZK	8
1	of the concepts discussed and on the derivation of basic relationships and connecti		
	etric input. In addition, students will gain extended knowledge in some thematic areas		
of a matrix, Taylor polynomial, integral as a limit function, integration	· · · · · · · · · · · · · · · · · · ·	J	
E011062 Mathematics II		Z,ZK	8
· ·	ı Partial derivatives and differentiability. Gradient and directional derivative. Differer.	, i	-
	lute) extremes of a function of more variables. Double integral, volume (=triple) integral	· ·	
. , , , , , , , , , , , , , , , , , , ,	smooth curve and line integral of a scalar and vector function. Circulation and Gre		
	urface and surface integral of a scalar function and a vector function. Flow of a vector		
Gauss-Ostrogradskij theorem.	·	· ·	
E011009 Mathematics III.		Z,ZK	5
An introductory course in ordinary differential equation and infinite	series.	_,	
E372083 Measurement in Engineering		KZ	3
1 3 3	ıriables (temperature, position, force, speed, acceleration, torque). Calibration and		-
instruments.			
E311101 Mechanics I.		Z,ZK	4
l l	ı ats and equilibrium of a point. Moment and Torque. Body constraints in 2D. Replace	· · · · · · · · · · · · · · · · · · ·	
- · · · · · · · · · · · · · · · · · · ·	nerically. Body constraints in 3D. Replacement and general spatial equilibrium of a		-
	and mobility, composition. Analytical solution of equilibrium for MBS systems. Truss	=	
	with friction. Mechanical work. Power. Efficiency. Equilibrium position.	•	
E311102 Mechanics II.		Z,ZK	4
	ı natics of concurrent movements. Motion: translation, rotation, general planar motion	, i	n, screw motion,
	nechanisms. Analytical methods in kinematics of mechanisms - Trigonometric and v	=	
	th geers. Strutting and seezing in mechanisms. Cable mechanisms.		
E181026 Momentum, Heat and Mass Tran	sfer	Z,ZK	5
	fluids. Navier-Stokes equations. Momentum transport in turbulent flows. Mechanica		
-	Forced and natural convection heat transfer. Heat transfer with phase changes and t		
systems. Mass transfer by molecular diffusion, convection, with che	· · · · · · · · · · · · · · · · · · ·		
E011049 Numerical Mathematics		Z,ZK	4
E021041 Physics I.		Z,ZK	7
, -	ا cussed concepts and on the derivation of basic relationships and connections betv:		tudents will gain
knowledge in some thematic areas that will be used in follow-up co		.com comcopio. c	.uuu yu
E021025 Physics II.		Z,ZK	4
1 3	ا ctromagnetic waves. Light, wave optics, geometrical optics. Quantum properties of e		
	of matter. Quantum-mechanical description of particle's motion. Hydrogen atom an	-	
•	leus, radioactivity, sources of nuclear energy. Laboratories - measurements of 6 ex		
E331068 Technology I.		Z,ZK	5
1 37	ا ion. Moulding and core making. Thermal treatment. Plastic deformation. Division of fc		
heating-up. Cutting. Cold and hot forming. Welds. Weldability. Weld	-		. Com products,
E341014 Technology II.		Z,ZK	5
LOTIOTA   TECHNOLOGY II.		۷,۷۱۸	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: 12B\*A\*P-ZT12

Name of the group: 03 2012 anglicky ZT v pořadí 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 pořadí 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.

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

Name of the group: 04 2012 bakalářský povinný tělocvik 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. | Z,ZK | 6 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	Z	4	0P+4C	*	Р
E131026	Machine Elements and Mechanisms II. František Lopot, Daniel Hadraba František Lopot 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 calculat	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, des	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

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 bakalářské zkoušky z jazyků 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 Jaroslava Kommová	ZK	2	0P+2C	*	PV
2041063	French - Bachelor Exam /FME Dušana Jirovská Eliška Vítková Dušana Jirovská (Gar.)	Z,ZK	2	0P+2C	*	PV
2041062	German - Bachelor Exam / FME Jaroslava Kommová, Eliška Vítková, Petr Laurich Jaroslava Kommová Jaroslava Kommová (Gar.)	Z,ZK	2	0P+2C	*	PV
2041065	Russian - Bachelor Exam / FME Hana Volejníková, Dušana Jirovská Eliška Vítková Dušana Jirovská (Gar.)	Z,ZK	2	0P+2C	*	PV
2041064	Spanish - Bachelor Exam / FME 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 bakalářské z	koušky z jazyk	ků anglicky
2041061	English-Bachelor Exam	Z,ZK	2
Mapped to the Comm	on European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater dif	ficulties, 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 Comm	on European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater dif	ficulties, 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 Comm	on European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater dif	ficulties, 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 Comm	on European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater dif	ficulties, 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 Comm	on European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater dif	ficulties, 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 Comm	on European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater dif	ficulties, 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	rom the branch of specialization (instrumentation, control engineering, informatics), or individual work, related to another subjection	ct.	•			
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 projektů 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 projektů anglicky

E153091	Project Presentation	Z	4		
E363091	Project Presentation	Z	4		
E373091	Project Presentation	Z	4		
Presentation of the proj	Presentation of the project prepared for the subject E372091. Report in pdf format and prepared presentation (MS Powerpoint, Impress) required. Presentation, discussion (question				
of another students and	I their supervisors).				
E183091	Project Presentation	Z	4		
Preparation and presen	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 doporučené semináře 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 Rudolf Sýkora, Zdeněk Kohout, Zuzana Budinská, Petr Ducháček, Jan Novák, Miroslav Jílek, Daniel Tischler, Rudolf Sýkora Zdeněk Kohout (Gar.)	Z	2	0P+2C	*	V
E026003	Physics II Seminary Petr Ducháček	Z	2	0P+2C	*	V

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

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

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 doporučené 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 Volejniková, 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  Jaroslava Kommová, Petr Laurich 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  Jaroslava Kommová Jaroslava Kommová	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 <b>Jaroslava Kommová</b> 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 doporučené základní jazykové kurzy anglicky

E046117	Czech - Advanced	Z	2
Comprehension of s	poken language as well as lectures in Czech on topics familiar to the student. Communication with native speakers, participation	in discussions. Expre	essing 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 sim	ple way about
familiar topics. Read	ing and comprehension of simple texts. Improvement of professional language.		
E046128	Czech - Upper Intermediate	Z	2
Mapped to the Com	mon European Framework of Reference Level A2-B1. The aim is to extend language skills taking into consideration profession	al Czech and comm	on professional
terminology. Compre	ehension of standard Czech speech and conversation about topics of everyday life - at school, at work, during free time, on inte	ermediate level. Broa	dening the
knowledge technica	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 great	t difficulties and
active participation i	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-sci	entific and
scientific articles or	exts from student's field of studies without difficulties. Grammar structures on advanced level.		
E046120	Czech for Beginners II.	Z	2
Mapped to the Com	non European Framework of Reference Level A1 Aim: Basic vocabulary of everyday life in a written and spoken form. Understa	anding and use of ba	sic expressions
of general scientific	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 whic	h a student meets at	school or in
his/her free time and	I speaking about them. Writing in a simple way about familiar topics. Reading and comprehension of simple texts. Improvemen	t of professional lang	guage.
E046127	Czech Upper Intermediate	Z	2
LUTUILI	Ozech Opper intermediate		
	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 expe	riences and
Understanding stand		ility to describe expe	eriences and
Understanding standerents, briefly explain	dard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ab n one's opinions and plans. Reading and understanding general and technical texts.	ility to describe expe	eriences and
Understanding standevents, briefly explain	dard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ab	Z	2
Understanding standevents, briefly explain E046078 Aim: Understanding	dard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ab n one's opinions and plans. Reading and understanding general and technical texts.  German - Lower Intermediate Course	Z	2
Understanding standevents, briefly explain E046078 Aim: Understanding	dard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ab n one's opinions and plans. Reading and understanding general and technical texts.  German - Lower Intermediate Course clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about the	Z	2
Understanding standevents, briefly explain E046078 Aim: Understanding familiar topics. Read E046079	dard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ab n one's opinions and plans. Reading and understanding general and technical texts.  German - Lower Intermediate Course clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about thing and comprehension of simple texts. Improvement of professional language.	Z nem. Writing in a sim	2 ple way about
Understanding standevents, briefly explain E046078 Aim: Understanding familiar topics. Read E046079 Mapped to the level	dard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ab n one's opinions and plans. Reading and understanding general and technical texts.  German - Lower Intermediate Course clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about thing and comprehension of simple texts. Improvement of professional language.  German Lower Intermediate	Z nem. Writing in a sim Z ich a student meets	2 ple way about 2 either at schoo
Understanding standevents, briefly explain E046078 Aim: Understanding familiar topics. Read E046079 Mapped to the level	dard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ab n one's opinions and plans. Reading and understanding general and technical texts.  German - Lower Intermediate Course clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about thing and comprehension of simple texts. Improvement of professional language.  German Lower Intermediate of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations who	Z nem. Writing in a sim Z ich a student meets	2 ple way about 2 either at schoo
Understanding standevents, briefly explain E046078 Aim: Understanding familiar topics. Read E046079 Mapped to the level or in his/her free tim E046080	dard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ab n one's opinions and plans. Reading and understanding general and technical texts.  German - Lower Intermediate Course clearly what is spoken about everyday situations which a student meets at school or in his/her free time and speaking about thing and comprehension of simple texts. Improvement of professional language.  German Lower Intermediate of Common European Framework of Reference A2 Aim: Understanding clearly spoken language about everyday situations where and speaking about them. Writing in a simple way about familiar topics. reading and comprehesion of simple texts. Improvement	Z nem. Writing in a sim  Z ich a student meets nent of professional lich	2 ple way about  2 either at school anguage.  2

E046081	German Upper Intermediate	Z	2
Mapped to the level of	f Common European Framework of Reference:A2 - B1 Understanding standard speech about familiar topics, that a students c	omes 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 and	d technical texts.
E046082	German Advanced	Z	2
Comprehension of sp	oken language as well as lectures in German on topics familiar to the student. Communication with native speakers, participat	ion in discussions	Expressing
opinions. Written skill	s. Ability to write an essay or a report. Reading and understanding texts concerning currant issues and popular scientific and te	echnical articles.	
E046083	German Advanced	Z	2
Mapped to the level of	f Common European Framework of Reference: B1- B2 The aim: comprehension of spoken German as well as lectures given ir	German without	great difficulties
and active participation	on in a discussion. Written and oral skills on advanced level. Ability to write a summary, a report, an essay. Reading and compre	ehension of popul	ar-scientific and
scientific articles or te	xts from student's field of studies without difficulties. Grammar structures on advanced level.		
E046076		Z	2
E046077	German Beginners	Z	2
Mapped to the Comn	ion European Framework of Reference level A1. Basic vocabulary of everyday lifein a written and spoken form. understanding	and use of basic e	expressions of
general scientific terr	ninology		

## List of courses of this pass:

	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 difficulti	es, 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 difficulti		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 difficulti		
	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 difficulti		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
	mon 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.	,	
2041066	Czech - Bachelor Exam	ZK	2
	mon 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.		
E011009	Mathematics III.	Z,ZK	5
2011000	An introductory course in ordinary differential equation and infinite series.	2,210	
E011021	Constructive Geometry	Z,ZK	6
L011021	The subject is focused on geometric objects in the space - curves, surfaces and solids and their properties and mutual relation		U
E011049	Numerical Mathematics	Z,ZK	4
		Z,ZK	
E011056	Mathematics I.   er emphasis is placed on the theoretical basis of the concepts discussed and on the derivation of basic relationships and connections		8
	the procedures for solving problems with parametric input. In addition, students will gain extended knowledge in some thematic areas: eig		
will also get to know	of a matrix, Taylor polynomial, integral as a limit function, integration of some special functions.	gerinambers and e	igenvector.
E011062	Mathematics II	Z.ZK	8
	ا set, boundary in E^k. Real function of k-variables. Partial derivatives and differentiability. Gradient and directional derivative. Differentia	,	_
•	unction given implicitly. Local and global (= absolute) extremes of a function of more variables. Double integral, volume (=triple) integral, F	-	
, ,	; cylindrical and spherical coordinates. A simple smooth curve and line integral of a scalar and vector function. Circulation and Green'		
• .	e 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, independend		r field through a si	urface. The
field, independend		r field through a si	urface. The
	Gauss-Ostrogradskij theorem.		
E012035	Gauss-Ostrogradskij theorem.  Algorithmization and Programming	KZ	4
E012035 Programming in M	Gauss-Ostrogradskij theorem.  Algorithmization and Programming  MATLAB and its programming language. MATLAB command line. Elementary commands, variable, assignment and expression. Matric	KZ ces, vectors and o	4 perations.
E012035 Programming in M	Gauss-Ostrogradskij theorem.  Algorithmization and Programming	KZ ces, vectors and o	4 perations. ons. Scripts
E012035  Programming in M Writting M-script. In and functions. Str	Gauss-Ostrogradskij theorem.  Algorithmization and Programming  MATLAB and its programming language. MATLAB command line. Elementary commands, variable, assignment and expression. Matric put and output. Condition and cycle. Algorithmization of simple problems in MATLAB. Graphical commands. Matrix operations. System	KZ ces, vectors and o ms of linear equati ructures. Algorithm	4 perations. ons. Script
E012035  Programming in M Writting M-script. In and functions. Str	Gauss-Ostrogradskij theorem.  Algorithmization and Programming  MATLAB and its programming language. MATLAB command line. Elementary commands, variable, assignment and expression. Matric put and output. Condition and cycle. Algorithmization of simple problems in MATLAB. Graphical commands. Matrix operations. System ructure of program. Variables, expressions, assignment, and input / output commands. switch. For cycle. Arrays and files. Pointers. Str.: minimum, mean, norm, numerical integration, bisection method, Newton method, matrix operations. Direct methods for solution of systems.	KZ ces, vectors and o ms of linear equati ructures. Algorithm	4 perations. ons. Script
E012035 Programming in M Writting M-script. In and functions. Str simple programs E012037	Gauss-Ostrogradskij theorem.  Algorithmization and Programming  MATLAB and its programming language. MATLAB command line. Elementary commands, variable, assignment and expression. Matric put and output. Condition and cycle. Algorithmization of simple problems in MATLAB. Graphical commands. Matrix operations. System ructure of program. Variables, expressions, assignment, and input / output commands. switch. For cycle. Arrays and files. Pointers. Strict in minimum, mean, norm, numerical integration, bisection method, Newton method, matrix operations. Direct methods for solution of systems.  Computer Graphics	KZ ces, vectors and o ms of linear equati uctures. Algorithm ystems of linear e KZ	4 perations. ons. Scripts sization of quations.
E012035 Programming in M Writting M-script. In and functions. Str simple programs E012037	Gauss-Ostrogradskij theorem.  Algorithmization and Programming  MATLAB and its programming language. MATLAB command line. Elementary commands, variable, assignment and expression. Matric put and output. Condition and cycle. Algorithmization of simple problems in MATLAB. Graphical commands. Matrix operations. System ructure of program. Variables, expressions, assignment, and input / output commands. switch. For cycle. Arrays and files. Pointers. Str.: minimum, mean, norm, numerical integration, bisection method, Newton method, matrix operations. Direct methods for solution of systems.	KZ ces, vectors and o ms of linear equati uctures. Algorithm ystems of linear e KZ	4 perations. ons. Scripts sization of quations.
E012035 Programming in M Writting M-script. In and functions. Sti simple programs E012037 The subject is focu	Gauss-Ostrogradskij theorem.  Algorithmization and Programming MATLAB and its programming language. MATLAB command line. Elementary commands, variable, assignment and expression. Matric put and output. Condition and cycle. Algorithmization of simple problems in MATLAB. Graphical commands. Matrix operations. System outcure of program. Variables, expressions, assignment, and input / output commands. switch. For cycle. Arrays and files. Pointers. Str.: minimum, mean, norm, numerical integration, bisection method, Newton method, matrix operations. Direct methods for solution of system on the mathematical theory of the curves and surfaces in computer graphics and their visualisation. The Rhinoceros - NURBS methods to demonstrate the geometrical properties of the curves and surfaces.	KZ ces, vectors and o ms of linear equati ructures. Algorithm ystems of linear e KZ rodelling for Windo	4 perations. ons. Scripts ization of quations.
E012035 Programming in M Writting M-script. In and functions. Sti simple programs E012037 The subject is focu	Gauss-Ostrogradskij theorem.  Algorithmization and Programming MATLAB and its programming language. MATLAB command line. Elementary commands, variable, assignment and expression. Matric put and output. Condition and cycle. Algorithmization of simple problems in MATLAB. Graphical commands. Matrix operations. System recture of program. Variables, expressions, assignment, and input / output commands. switch. For cycle. Arrays and files. Pointers. Str.: minimum, mean, norm, numerical integration, bisection method, Newton method, matrix operations. Direct methods for solution of system of the mathematical theory of the curves and surfaces in computer Graphics  Seed on the mathematical theory of the curves and surfaces in computer graphics and their visualisation. The Rhinoceros - NURBS methods to demonstrate the geometrical properties of the curves and surfaces.  Physics II.	KZ ces, vectors and of the set of linear equation of linear equation of linear expression of	4 perations. ons. Script sization of quations. 3 ows is used
E012035 Programming in M Writting M-script. In and functions. Str simple programs E012037 The subject is focu E021025 Faraday's law of ele	Gauss-Ostrogradskij theorem.  Algorithmization and Programming MATLAB and its programming language. MATLAB command line. Elementary commands, variable, assignment and expression. Matric put and output. Condition and cycle. Algorithmization of simple problems in MATLAB. Graphical commands. Matrix operations. System outcure of program. Variables, expressions, assignment, and input / output commands. switch. For cycle. Arrays and files. Pointers. Str.: minimum, mean, norm, numerical integration, bisection method, Newton method, matrix operations. Direct methods for solution of system on the mathematical theory of the curves and surfaces in computer graphics and their visualisation. The Rhinoceros - NURBS methods to demonstrate the geometrical properties of the curves and surfaces.	KZ ces, vectors and of the set of linear equation of linear equations of linear expenses	4 perations. ons. Script nization of quations. 3 ows is used 4 s. Interaction
E012035 Programming in M Writting M-script. In and functions. Str simple programs E012037 The subject is focu E021025 Faraday's law of ele of radiation with m	Gauss-Ostrogradskij theorem.  Algorithmization and Programming MATLAB and its programming language. MATLAB command line. Elementary commands, variable, assignment and expression. Matric put and output. Condition and cycle. Algorithmization of simple problems in MATLAB. Graphical commands. Matrix operations. System recture of program. Variables, expressions, assignment, and input / output commands. switch. For cycle. Arrays and files. Pointers. Str.: minimum, mean, norm, numerical integration, bisection method, Newton method, matrix operations. Direct methods for solution of system of the mathematical theory of the curves and surfaces in computer Graphics  Seed on the mathematical theory of the curves and surfaces in computer graphics and their visualisation. The Rhinoceros - NURBS method to demonstrate the geometrical properties of the curves and surfaces.  Physics II.  Ctromagnetic induction. Maxwell's equations, electromagnetic waves. Light, wave optics, geometrical optics. Quantum properties of electromagnetic variables.	KZ ces, vectors and of the set of linear equation of linear equation of linear experience of	4 perations. ons. Scripts sization of quations. 3 ows is used 4 s. Interaction of elements.
E012035 Programming in M Writting M-script. In and functions. Str simple programs E012037 The subject is focu E021025 Faraday's law of ele of radiation with m Spectra, x-rays, ;las	Gauss-Ostrogradskij theorem.  Algorithmization and Programming MATLAB and its programming language. MATLAB command line. Elementary commands, variable, assignment and expression. Matric put and output. Condition and cycle. Algorithmization of simple problems in MATLAB. Graphical commands. Matrix operations. System ructure of program. Variables, expressions, assignment, and input / output commands. switch. For cycle. Arrays and files. Pointers. Str.: minimum, mean, norm, numerical integration, bisection method, Newton method, matrix operations. Direct methods for solution of system of the curves and surfaces in computer Graphics  Seed on the mathematical theory of the curves and surfaces in computer graphics and their visualisation. The Rhinoceros - NURBS matrices of the curves and surfaces.  Physics II.  Ctromagnetic induction. Maxwell's equations, electromagnetic waves. Light, wave optics, geometrical optics. Quantum properties of elect atter. Photoelectric effect. Wave-particle mature of matter. Quantum-mechanical description of particle's motion. Hydrogen atom and particle. Band theory of solids, semiconductors. Nucleus, radioactivity, sources of nuclear energy. Laboratories - measurements of 6 experi	KZ ces, vectors and o ms of linear equati ructures. Algorithm ystems of linear e KZ codelling for Windo Z,ZK tromagnetic waves periodic system or iments related to te	4 perations. ons. Scripts nization of quations. 3 ows is used 4 s. Interaction f elements. he lectures
E012035 Programming in M Writting M-script. In and functions. Str simple programs E012037 The subject is focu E021025 Faraday's law of ele of radiation with m Spectra, x-rays, ;las E021041	Gauss-Ostrogradskij theorem.  Algorithmization and Programming MATLAB and its programming language. MATLAB command line. Elementary commands, variable, assignment and expression. Matric put and output. Condition and cycle. Algorithmization of simple problems in MATLAB. Graphical commands. Matrix operations. System recture of program. Variables, expressions, assignment, and input / output commands. switch. For cycle. Arrays and files. Pointers. Str.: minimum, mean, norm, numerical integration, bisection method, Newton method, matrix operations. Direct methods for solution of system of the mathematical theory of the curves and surfaces in computer Graphics  Seed on the mathematical theory of the curves and surfaces in computer graphics and their visualisation. The Rhinoceros - NURBS method to demonstrate the geometrical properties of the curves and surfaces.  Physics II.  Ctromagnetic induction. Maxwell's equations, electromagnetic waves. Light, wave optics, geometrical optics. Quantum properties of elect atter. Photoelectric effect. Wave-particle mature of matter. Quantum-mechanical description of particle's motion. Hydrogen atom and properties of the curves and surfaces.	KZ ces, vectors and o ms of linear equati ructures. Algorithm ystems of linear e KZ rodelling for Windo Z,ZK tromagnetic waves periodic system of iments related to to Z,ZK	4 perations. ons. Scripts nization of quations. 3 ows is used 4 s. Interaction f elements. he lectures

		1	T
E026002	Physics I Seminary Solving of problems corresponding to the lectures of Physics I.	Z	2
E026003	Physics II Seminary	Z	2
	nded for students who need more detailed practising and improvement (including knowledge from former physics courses, or high-sc	1	I
successful finishing	g Physics II course. The instructions are analogical to seminars with a short corresponding theoretical background. The link between p	hysical concepts	and 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 an	d use of basic ex	pressions of
	general scientific terminology.		
E046078	German - Lower Intermediate Course	Z	2
Aim: Understandir	ng 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 simp	le way about
	familiar topics. Reading and comprehension of simple texts. Improvement of professional language.		
E046079	German Lower Intermediate	Z	2
	el 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. Improveme		
		True professional	
E046080	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	to describe expe	2
Onderstanding st	events, briefly explain one's opinions and plans.	to describe exper	oences and
E046081	German Upper Intermediate	Z	2
	rel of Common European Framework of Reference:A2 - B1 Understanding standard speech about familiar topics, that a students con		
• •	nd talking about these topics. Ability to describe experiences and events, explain one's opinions and plans. Reading and understandi		
E046082	German Advanced	Z	2
	of spoken language as well as lectures in German on topics familiar to the student. Communication with native speakers, participatio	_	l .
opinions.	Written skills. Ability to write an essay or a report. Reading and understanding texts concerning currant issues and popular scientific	and technical artic	cles.
E046083	German Advanced	Z	2
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	erman without gre	eat difficulties
and active particip	ation in a discussion. Written and oral skills on advanced level. Ability to write a summary, a report, an essay. Reading and comprehe	nsion of popular-	scientific and
	scientific articles or texts from student's field of studies without difficulties. Grammar structures on advanced level.		
E046117	Czech - Advanced	Z	2
•	spoken language as well as lectures in Czech on topics familiar to the student. Communication with native speakers, participation in dis	•	sing opinions
	en skills. Ability to write an essay or a report. Reading and understanding texts concerning currant issues and popular scientific and t		
E046118	Czech Advanced	Z	2
	el of Common European Framework of Reference: B1- B2 The aim: comprehension of spoken Czech as well as lectures given in Czer ion in a discussion. Written and oral skills on advanced level. Ability to write a summary, a report, an essay. Reading and comprehens	_	
active participat	scientific articles or texts from student's field of studies without difficulties. Grammar structures on advanced level.	non or popular-sc	ientine and
E046119	Czech Language for Beginners I.	7	2
	abulary of everyday life in a spoken and written form. Understanding and use of basic expressions of general scientific terminology (p	_	
E046120	Czech for Beginners II.	7	2
	nmon European Framework of Reference Level A1 Aim: Basic vocabulary of everyday life in a written and spoken form. Understanding	g and use of basi	_
	of general scientific terminology (professional language).		
E046125	Czech - Lower Intermediate	Z	2
Aim: Understandir	ng 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 simp	le way about
	familiar topics. Reading and comprehension of simple texts. Improvement of professional language.		
E046126	Czech Lower Intermediate	Z	2
	vel 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		
E046127	Czech Upper Intermediate	Z	2
Understanding st	andard speech about familiar matters that a student meets at work, at school, during free time, and talking about these topics. Ability	to describe expe	riences and
F046100	events, briefly explain one's opinions and plans. Reading and understanding general and technical texts.	7	
E046128	Czech - Upper Intermediate  mmon European Framework of Reference Level A2-B1. The aim is to extend language skills taking into consideration professional Cz	Z	2
	nprehension of standard Czech speech and conversation about topics of everyday life - at school, at work, during free time, on interm		-
	knowledge technical language.		
E131002	Engineering Design II	Z,ZK	4
	nentals of GPS (Geometrical Product Specification). Students will get critical knowledge about ISO system of limits and fits, tolerancin	1 '	1
	nsional loops, tolerancing of angles and cones, tolerancing of threads. Integral part of course is a project where students apply and project where students apply apply and project where students apply	-	-
	lectures.		
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 thei	r accessories
	and fittings.		1
E131512	Machine Elements and Mechanisms I.	Z,ZK	6
-	elements (screwed, clamped, splined, welded, riveted, soldered and adhesive joints; joints with use of feathers, pins, tenons, cotters, ke		
	ion, gear drives). Seminars are devoted to practical individual solution of simple design projects - tasks with motion screws, preloaded nd key joints between shafts and hubs and tasks with welded and riveted joints. Sketching of machine elements and their simple asser	_	-
-	nd key joints between snatts and nubs and tasks with welded and riveted joints. Sketching of machine elements and their simple asser Irk. Supporting systemes, mechanical joints, material joints, joining elements, mechanical transmissions, dimensioning, loading capac	-	-
E133013		Z	2
E133013	Engineering Design III.	Z	2
	Engineering Design IV. general principles of a new technical product design, stages of development of a new product, the designer fundamental assignment is	_	1
	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		545 produc
	- 2-2-3 and 30 and an arranged by the device by mounts of which holds on many duplicate parts may be drilled exact	,	

E133025	Doolan	7	1
	Design  , design calculations and their aplications in case of geared transmissions, axles and shafts, sliding and rolling bearings, shaft coupli	Z	4
			_
E141504	Electrical Circuits and Electronics	Z,ZK	4
	eory of electrical circuits, analysis special types of electrical circuits as DC and AC. Transient states in circuits with accumulators of energy of electrical circuits as DC and AC. Transient states in circuits with accumulators of energy of the state		-
	er transformation for analysis AC circuits supplied with harmonic signal. El. Power and Energy. Introduction into electronics. Principle al		
semiconductor co	omponents. Application in electronic circuits (rectifier, stabilizer, power control, operational amplifier). Analogue and digital circuits. Prin	ciple of analogue	and digital
	signal processing. Logical circuits, converters, microprocessor.		
E141505	Electrical Machines and Drives	Z,ZK	4
C el. curcuits. El	ectrical power and energy. Calculation, measurement, power factor. Magnetic circuit, materials, hysteresis loop. Electromagnet. Transfo	ormer, principle, o	construction
3-phase transfo	mer, operating conditions, rated (scheduled) values. Induction machine, principle, construction, operating conditions. Starting, speed-	orque characteri:	stic, speed
ontrol. Synchrono	us machines. DC-machines, principle, parameters, operating conditions, construction, starting, speed control, speed-torque characteri	stic. Low-voltage	instrument
	Low-voltage distribution system.		
E152091	Project	KZ	2
E153005	Fundamentals of Energy Conversions	Z	1
	larify the reasons, procedures and consequences of energy conversions from sources to applications. 1. Introduction. Energy, forms a	<del>-</del>	1 -
=	y sources to cover world energy consumption. World reserves, advances and depletion of primary energy sources. Situation on the Wo		_
	and properties. Secondary fuels. Combustion of fossil fuels. Combustion equipment and their efficiency. Ecological consequences of co		
	urnot's comparison cycle. Thermal efficiency. 4. Rankine steam cycle, thermal and real efficiency. Steam circulation carnotization. Surve		
· ·	Internal 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		
.a.a, omolerity X	problems). Direct transformation (heat->Electr.). Special applications.	oo, apphoation,	
E1E0001		7	
E153091	Project Presentation	Z	4
E181026	Momentum, Heat and Mass Transfer	Z,ZK	5
	transport phenomena balances in homogeneous fluids. Navier-Stokes equations. Momentum transport in turbulent flows. Mechanical		
me distributions i	n continuous systems. Conduction heat transfer. Forced and natural convection heat transfer. Heat transfer with phase changes and ther	mal radiation. Mu	Iticompone
	systems. Mass transfer by molecular diffusion, convection, with chemical reactions and interphase mass transfer.		
E182019	Chemistry	KZ	3
General chemist	ry from the point of view of mechanical and process engineering. Physical chemistry forms 2/3 of the course (structure and properties	of matter, thermo	odynamics,
	n, chemical reactions, reaction engineering), the remaining 1/3 is devoted to organic chemistry (hydrocarbons, polymers) and biocher		-
	oriented upon the material properties measurement.	, ,	•
E182091	Project	KZ	2
L102031	Absolvent se seznámí se základy oboru Procesní technika.	IXZ	_
E400004			
E183091	Project Presentation	Z	4
	Preparation and presentation of a given project theme.		
E311101	Mechanics I.	Z,ZK	4
-	hanical systems. Determination of force. Constraints and equilibrium of a point. Moment and Torque. Body constraints in 2D. Replacen		-
	forces. The balance of the body in the plane - numerically. Body constraints in 3D. Replacement and general spatial equilibrium of a s	stem of forces. T	
of the body in 3			
,	D. MBS - Multi Body Systems. Static determinancy and mobility, composition. Analytical solution of equilibrium for MBS systems. Truss	systems. Center	of gravity.
	D. MBS - Multi Body Systems. Static determinancy and mobility, composition. Analytical solution of equilibrium for MBS systems. Iruss Internal forces. The balance of the body and of multibody systems with friction. Mechanical work. Power. Efficiency. Equilibrium potentials.	systems. Center	of gravity.
E311102		systems. Center	of gravity.
E311102	Internal forces. The balance of the body and of multibody systems with friction. Mechanical work. Power. Efficiency. Equilibrium po	systems. Center osition.	4
E311102 inematics of poin	Internal forces. The balance of the body and of multibody systems with friction. Mechanical work. Power. Efficiency. Equilibrium po	systems. Center osition.  Z,ZK oherical motion, s	4 crew motion
E311102 inematics of poin	Internal forces. The balance of the body and of multibody systems with friction. Mechanical work. Power. Efficiency. Equilibrium pomechanics II.  and of rigid bodies. Transformation matrix. Kinematics of concurrent movements. Motion: translation, rotation, general planar motion, specific process.	systems. Center osition.  Z,ZK oherical motion, sor method. Graph	4 crew motion
E311102 inematics of poin eneral spatial mo	Internal forces. The balance of the body and of multibody systems with friction. Mechanical work. Power. Efficiency. Equilibrium power and of rigid bodies. Transformation matrix. Kinematics of concurrent movements. Motion: translation, rotation, general planar motion, spition. Composition of mechanisms. Basic planar mechanisms. Analytical methods in kinematics of mechanisms - Trigonometric and vector in kinematics. Basic theory of gearing. Transmition mechanisms with geers. Strutting and seezing in mechanisms. Cable mechanisms.	systems. Center osition. Z,ZK oherical motion, s or method. Graph isms.	4 crew motion ical method
E311102 inematics of poin eneral spatial mo	Internal forces. The balance of the body and of multibody systems with friction. Mechanical work. Power. Efficiency. Equilibrium power and of rigid bodies. Transformation matrix. Kinematics of concurrent movements. Motion: translation, rotation, general planar motion, spanion. Composition of mechanisms. Basic planar mechanisms. Analytical methods in kinematics of mechanisms - Trigonometric and vector in kinematics. Basic theory of gearing. Transmition mechanisms with geers. Strutting and seezing in mechanisms. Cable mechanisms in Mechanics III.	systems. Center sition.  Z,ZK sherical motion, s or method. Graph isms.  Z,ZK	4 crew motion ical method
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E311102 inematics of poin eneral spatial mo E311108 Modeling. Dynami	Internal forces. The balance of the body and of multibody systems with friction. Mechanical work. Power. Efficiency. Equilibrium power and of rigid bodies. Transformation matrix. Kinematics of concurrent movements. Motion: translation, rotation, general planar motion, spition. Composition of mechanisms. Basic planar mechanisms. Analytical methods in kinematics of mechanisms - Trigonometric and vector in kinematics. Basic theory of gearing. Transmition mechanisms with geers. Strutting and seezing in mechanisms. Cable mechanisms of systems of particles. Dynamics of body. Mass distribution in a body. Inertia tensor. D'Alembert principle. Inertial effects of motion am method. Newton-Euler equations. Dynamics of multibody systems. Vibrations of systems with 1 DOF. Free oscillations. Forced osci	systems. Center sition.  Z,ZK sherical motion, so method. Graph sisms.  Z,ZK Balancing of rotal lations excited by	4 crew motio ical method 6 atting bodies
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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	ne use of compute	ers. Students
gain praction	al skills by creating an essay in a text editor, by realizing technical computations with a spreadsheet calculator, and by creating and p	resenting a web p	age.
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	verification of mea	surement
	instruments.		
E372091	Project	KZ	2
An	individual project from the branch of specialization (instrumentation, control engineering, informatics), or individual work, related to an	nother subject.	·
E373091	Project Presentation	Z	4
Presentation of the	project prepared for the subject E372091. Report in pdf format and prepared presentation (MS Powerpoint, Impress) required. Prese	ntation, discussion	n (questions
	of another students and their supervisors).		
E381054	Management and Economics of the Enterprise	Z,ZK	4
The study subject i	s 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 acquain	nt technically
educated foreign st	rudents with the basic procedures, methodologies and practice of management and economics of a modern, especially engineering co	mpany. The teachi	ng concerns
both the areas of	finance, marketing and operational-production management and economics. The focus is on a prosperous enterprise operating within	n the framework o	of Lean Six
Sigma and Industr	y 4.0. In addition to lectures and exercises, students also learn to be independent in their individual presentations, dedicated to the a	ssigned profession	nal topics of
	advanced business management.		

For updated information see <a href="http://bilakniha.cvut.cz/en/FF.html">http://bilakniha.cvut.cz/en/FF.html</a> Generated: day 2025-12-13, time 15:18.