## Study plan

# Name of study plan: BS Diagnostika materiál

Faculty/Institute/Others: Department: Branch of study guaranteed by the department: Welcome page Garantor of the study branch: Program of study: Applications of Natural Sciences Type of study: Bachelor full-time Required credits: 94 Elective courses credits: 86 Sum of credits in the plan: 180 Note on the plan:

Name of the block: Compulsory courses of the specialization Minimal number of credits of the block: 94 The role of the block: PO

Code of the group: BSDMPP1 Name of the group: BSDM - povinné p edm ty 1. ro ník Requirement credits in the group: In this group you have to gain at least 24 credits Requirement courses in the group: In this group you have to complete at least 7 courses Credits in the group: 24 Note on the group:

Note on the g	lioup.					
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
02DEF1	History of Physics 1 Igor Jex, Miroslav Myška Miroslav Myška Igor Jex (Gar.)	Z	2	2+0	Z	PO
02ELMA	Electricity and Magnetism Iskender Yalcinkaya, Goce Chadzitaskos, Josef Schmidt, Jan Vysoký Jan Vysoký Goce Chadzitaskos (Gar.)	Z,ZK	6	4+2	L	PO
02MECH	Mechanics Iskender Yalcinkaya, David B e Michal Jex David B e (Gar.)	Z	4	4+2	Z	PO
02MECHZ	<b>Mechanics - Examination</b> Iskender Yalcinkaya, Goce Chadzitaskos, David B e , Filip Petrásek, Stanislav Skoupý, Antonín Hoskovec, Petr Novotný <b>Antonín Hoskovec</b> David B e (Gar.)	ZK	2	-	Z	PO
00PT	Preparatory Week Petr Ambrož, Milan Krbálek Petr Ambrož Petr Ambrož (Gar.)	Z	2	týden	Z	PO
02TER	Heat and Molecular Physics Filip Petrásek Petr Novotný Petr Jizba (Gar.)	Z,ZK	4	2+2	L	PO
18ZPRO	Basics of Programming Maksym Dreval, Vladimír Jarý, Miroslav Virius, Jakub Klinkovský, Petr Pauš, František Vold ich, Jan Tomsa, Zuzana Pet í ková <b>Miroslav Virius</b> Miroslav Virius (Gar.)	Z	4	4C	Z	PO

### Characteristics of the courses of this group of Study Plan: Code=BSDMPP1 Name=BSDM - povinné p edm ty 1. ro ník

02DEF1	History of Physics 1	7	n				
•===	History of Physics 1	L 2	2				
Physics and its place in the system of sciences. The relationship of man and nature. Natural sciences in ancient Orientand Greece, Greek natural philosophers, Aristotle. Physics in							
Helenistic period, Archir	ned. Arabic science, European science in Middle Ages. Renaissance - da Vinci, Giordano Bruno. Copernicus, Kepler, Galileo	o, Huygens. The bi	irth of physics				
as experimental science	e. Newton and his work.						
02ELMA	Electricity and Magnetism	Z,ZK	6				
Electric charge, Coulom	b's law, electrostatic field, Gauss' law. Electric dipole, polarization. Conductors anddielectrics. Electric current and circuits, co	onductivity. Basics	of the relativity				
theory. Electrodynamic f	orces, magnetic field. Magnetic dipole, magnetics. Electromagnetic induction, ac currents. Electromagnetic waves, Maxwell ec	quations					
02MECH	Mechanics	Z	4				
	Mechanics hysical quantities and units. Particle kinematics, basic types of motion and theirsuperposition. Particle dynamics, one-dimensional distribution of the second	Z sional equations o	4 f motion, motion				
ntroduction to physics, p							
ntroduction to physics, p in central force field, for	hysical quantities and units. Particle kinematics, basic types of motion and theirsuperposition. Particle dynamics, one-dimensional statements and theirsuperposition.						
ntroduction to physics, p in central force field, for	hysical quantities and units. Particle kinematics, basic types of motion and theirsuperposition. Particle dynamics, one-dimen- ces innoninertial reference frames. Mechanics of system of free particles, two-body problem, collisions. Mechanics ofrigid bo						
ntroduction to physics, p in central force field, for continuum mechanics, e 02MECHZ	hysical quantities and units. Particle kinematics, basic types of motion and theirsuperposition. Particle dynamics, one-dimen- ces innoninertial reference frames. Mechanics of system of free particles, two-body problem, collisions. Mechanics ofrigid bo elasticity, hydrodynamics. Sound.	dy, rotation. Funda					

02TER	Heat and Molecular Physics	Z,ZK	4					
Thermal expansion of n	Thermal expansion of materials, heat transfer; stationary and non-stationary heat conduction, heat transfer and penetration; 1st and 2nd thermodynamic principle, ideal and real gas							
entropy; non-chemical s	ystems: dielectric and magnetic materials; Maxwell relations and thermodynamic potentials; kinetic theory: Maxwell's velocity	distribution, equip	artition theorem.					
18ZPRO	Basics of Programming	Z	4					
This course is intended mainly for students with little or no experience in programming. It familiarizes the students with the basic concepts in programming and with the Python								
programming language.								

# Code of the group: BSDMPP2 Name of the group: BSDM - povinné p edm ty 2. ro ník Requirement credits in the group: In this group you have to gain at least 18 credits Requirement courses in the group: In this group you have to complete at least 4 courses Credits in the group: 18 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.) Theoretical Division 1

	Tutors, authors and guarantors (gar.)					'
02TEF1	Theoretical Physics 1 Petr Novotný Petr Novotný Igor Jex (Gar.)	Z,ZK	4	2+2	Z	PO
02TEF2	Theoretical Physics 2 Filip Petrásek, Petr Novotný Josef Schmidt Petr Novotný (Gar.)	Z,ZK	4	2+2	L	PO
02TSFA	Thermodynamics and Statistical Physics Igor Jex, Jaroslav Novotný Antonín Hoskovec Igor Jex (Gar.)	Z,ZK	4	2+2	L	PO
02VOAF	Waves, Optics and Atomic Physics	Z,ZK	6	4+2	Z	PO

#### Characteristics of the courses of this group of Study Plan: Code=BSDMPP2 Name=BSDM - povinné p edm ty 2. ro ník

 02TEF1
 Theoretical Physics 1
 Z,ZK
 4

 The course is an introduction to analytical mechanics. The students acquire knowledge of the basic concepts of the Lagrange and Hamiltonian formalism as well as diferent approaches to description of dynamics (Newton's, Lagrange, Hamilton and Hamilton-Jacobi equations). The efficiency of these methods is illustrated on elementary examples like the two-body problem, the motion of a system of constrained mass points, and of a rigid body. Advanced parts of the course cover differential and integral principles of mechanics. The subject is the first part of the course of classical theoretical physics (02TEF1, 02TEF2).

 02TEF2
 Theoretical Physics 2
 Z,ZK
 4

 Tensors and transformations in physics. Mechanics of point mass, rigid body and continuum. The special theory of relativity: relativistic mechanics and classical field theory in the Minkowski space-time. Classical electrodynamics: Maxwell's equations in the Minkowski space-time, electromagnetic waves in dielectric media, electromagnetic radiation in the dipole

 approximation.

 02TSFA
 Thermodynamics and Statistical Physics

 Foundation of thermodynamics and statistical physics. Thermodynamic potential, the Joule Thomson effect, conditions of equilibrium, the Braun-Le Chatelier principle. Statistical entropy.

 Basics of many body descriptionfrom a statistical point of view (classical and quasiclassical regime within the frame of a canonical and grand-canonical ensemble, Fermi gas, models of crystals and the black body radiation). The Boltzmann equation is used to discusses simple transport phenomena.

 02VOAF
 Waves, Optics and Atomic Physics

 Wave phenomena in mechanics and electromagnetism: modes, standing and travelling waves, wave packets indispersive media. Wave optics: polarization, interference, diffraction,

coherence. Geometrical optics. Introduction toquantum physics: black body radiation, quantum of energy, photoeffect, the Compton effect, the de Broglie waves, the Schrodinger equation, stationary states and spectra of finite systems.

## Code of the group: BSDMPP3

Name of the group: BSDM - povinné p edm ty 3. ro ník Requirement credits in the group: In this group you have to gain at least 52 credits Requirement courses in the group: In this group you have to complete at least 11 courses Credits in the group: 52 Note on the group:

Note on the group: Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their Code Completion Credits Scope Semester Role members) Tutors, authors and guarantors (gar.) **Bachelor Thesis 1** 14BPSM1 Ζ 5 0+5 1 PO Jií Kunz **Jií Kunz** Jií Kunz (Gar.) **Bachelor Thesis 2** Ζ 14BPSM2 10 0+10 2 PO Jií Kunz **Jií Kunz** Jií Kunz (Gar.) **Dynamics of Linear Systems** 14DYLS Z.ZK 2 1P+1C 6 PO í Kunz **Ji í Kunz** Ji í Kunz (Gar.) Elasticity 1 14EME1 Z,ZK 4 4 6 PO Vladislav Oliva, Aleš Materna Vladislav Oliva Vladislav Oliva (Gar.) Physics of Metals 1 11FKO1 ΖK 3 2 Ζ PO Rudolf Klepá ek, Ivo Kraus Ivo Kraus Rudolf Klepá ek (Gar.) 14FKO2 Z.ZK 6 6 6 PO Metal Physics 2 **Quantum Mechanics** 02KVAN Z.ZK 6 4+2 Ζ PO Martin Štefa ák Martin Štefa ák Martin Štefa ák (Gar.)

01NME2	Numerical Methods 2KZ2Michal Beneš Michal Beneš Michal Beneš (Gar.)KZ2				L	PO
01RMF	Image: Mmodel with a state of the second st				Z	PO
14TEM	Engineering Mechanics Ji í Kunz Ji í Kunz Ji í Kunz (Gar.)	Z,ZK	6	4	5	PO
14ZZKS	Testing and Processing of Metals and Alloys	KZ	4	4	6	PO
Characteristics	of the courses of this group of Study Plan: Code=BSDMPP3 Name=R	BSDM - povi	nné p ec	lm ty 3. r	o ník	
14BPSM1	Bachelor Thesis 1				Z	5
Student under guidar	nce of his/her supervisor has been working on the given particular topic for one year.					
14BPSM2	Bachelor Thesis 2				Z	10
14DYLS	Dynamics of Linear Systems			Z	,ZK	2
Abstract: Modelling o	of linear mechanical systems by means of simple computational system of discrete elements. F	ree and/or force	d vibration o		·	ith one or two
degrees of freedom. I	Kinetic equations of motion - their determination and solution. Analysis of motion stability.				-	
14EME1	Elasticity 1			Z	.ZK	4
The course represent	its an introduction for several another lectures on continuum mechanics and the strength of ma	aterials. The first	oart contain	is a detailed t	heory of str	ess, small
strains and linear ela	sticity. The second one represents a logical descent from the continuum mechanics to the prac	ctical engineering	solution of	simple probl	ems on ten	sion. bendina
	isticity. The second one represents a logical descent norm the continuant mechanics to the prac		30101101101			
	in the cross section of bars and beams.	stical oliginoornig	50101101101	emple pres		, J
					ZK	3
shearing and torsion	in the cross section of bars and beams.					
shearing and torsion	in the cross section of bars and beams. Physics of Metals 1 tis to give students basic knowledge in area physic of metals.			2		-
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shearing and torsion 11FKO1 The goal of this subject 14FKO2 The physical backgrosical backgr	in the cross section of bars and beams.  Physics of Metals 1 ect is to give students basic knowledge in area physic of metals.  Metal Physics 2 bund of processes encountered in production and thermo-mechanical treatment of metallic mat y of dislocations, diffusion, hardening and softening of metals and alloys.  Quantum Mechanics	erials is describe	d, including	J solidification	ZK ,ZK , crystal det ,ZK	3 6 fects, theory o
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shearing and torsion 11FKO1 The goal of this subject 14FKO2 The physical backgro solid solutions, theory 02KVAN The lecture describes includes description of 01NME2	in the cross section of bars and beams.   Physics of Metals 1 ect is to give students basic knowledge in area physic of metals.  Metal Physics 2 bund of processes encountered in production and thermo-mechanical treatment of metallic mat y of dislocations, diffusion, hardening and softening of metals and alloys.  Quantum Mechanics s the birth of quantum mechanics and description of one particle and more particles by elemen of observable quantities by operators in the Hilbert space and calculation of their spectra.	erials is describe	d, including space as w	z solidification Z rell as its time	ZK   ,ZK   ,, crystal def ,ZK   e evolution. I	3 fects, theory of Besides that in 2
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#### Name of the block: Compulsory elective courses Minimal number of credits of the block: 0 The role of the block: PV

 Code of the group: BSSPOLVEDY

 Name of the group: BS - Social Sciences

 Requirement credits in the group:

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

 Credits in the group: 0

 Note on the group:
 Only one of these courses is obligatory.

 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

00EKOT	Economy in Technology Jana Ková ová	Z	1	2+0		PV
00ETV	Ethics of Science and Technology Jakub Hají ek Jana Ková ová	Z	1	0+2	L	PV
00RET	Rhetoric Jana Ková ová Jana Ková ová	Z	1	0+2		PV
00UPRA	Introduction to Law Martin ech Jana Ková ová	Z	1	0+2		PV
00UPSY	Introduction to Psychology Jakub Hají ek Jana Ková ová	Z	1	0+2		PV

Role

#### Characteristics of the courses of this group of Study Plan: Code=BSSPOLVEDY Name=BS - Social Sciences

00EKOT	Economy in Technology	Z	1
The course introduces t	he basics of micro- and macroeconomics.		

00ETV	Ethics of Science and Technology	Z	1
00RET	Rhetoric	Z	1
	on the acquisition of speech and voice techniques and on the rules of correct pronounciation. The course is also devoted to the		
as well as to its nonver	bal aspects. Stylistics exercises, strategies for coping with stage-fright and a short excursion into the history of rhetoric are an	integral part of the	ne course.
00UPRA	Introduction to Law	Z	1
00UPSY	Introduction to Psychology	Z	1

Code of the group: BSMALA Name of the group: BS - analýza a algebra Requirement credits in the group: Requirement courses in the group: In this group you have to complete at least 10 courses 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
01DIFR	Differential Equations Michal Beneš Michal Beneš (Gar.)	Z,ZK	4	2P+2C	L	PV
01LALA	Linear Algebra A 1, Examination	ZK	5	-		PV
01LAA2	Linear Algebra A2 Lubomíra Dvo áková	Z,ZK	6	2+2	L	PV
01LALB	Linear Algebra B 1, Examination	ZK	3	-		PV
01LAB2	Linear Algebra B2 Petr Ambrož	Z,ZK	4	1+2	L	PV
01LAP	Linear Algebra Plus Lubomíra Dvo áková	Z,ZK	5	1+1	Z	PV
01LA1	Linear Algebra 1 Lubomíra Dvo áková	Z	1	2+1	Z	PV
01LAL	Linear Algebra 1 Petr Ambrož, Lubomíra Dvo áková Lubomíra Dvo áková Lubomíra Dvo áková (Gar.)	Z	2	2P+2C		PV
01LNA1	Linear Algebra 1 Lubomíra Dvo áková	Z	2	2+2		PV
01LAZ	Linear Algebra 1, Examination	ZK	2	-	Z	PV
01MANA	Calculus A 1, Examination Severin Pošta	ZK	6	-		PV
01MAA2	Calculus A2 Edita Pelantová	Z,ZK	10	4+4	L	PV
01MAA3	Calculus A3 František Štampach	Z,ZK	10	4+4	Z	PV
01MAA4	Calculus A4 František Štampach František Štampach František Štampach (Gar.)	Z,ZK	10	4+4	L	PV
01MANB	Calculus B 1, Examination Severin Pošta	ZK	4	-		PV
01MAB2	Calculus B2 Severin Pošta	Z,ZK	7	2+4	L	PV
01MAB3	Calculus B3 Milan Krbálek Milan Krbálek Milan Krbálek (Gar.)	Z,ZK	7	2+4	Z	PV
01MAB4	Calculus B4 Milan Krbálek, Ji í Mikyška, Miroslav Kolá <b>Milan Krbálek</b> Milan Krbálek (Gar.)	Z,ZK	7	2+4	L	PV
01MAP	Calculus Plus Mat j Tušek	ZK	6	0	Z	PV
01MA1	Calculus 1 Mat j Tušek	Z	4	4+4	Z	PV
01MAN	Calculus 1 Pavel Strachota, Miroslav Kolá, Edita Pelantová Pavel Strachota Edita Pelantová (Gar.)	Z	4	4+4		PV
01MAZ	Calculus 1, Examination Mat j Tušek	ZK	4	-	Z	PV
01NUM1	Numerical Mathematics 1	Z,ZK	4	3+1	Z	PV
12NME1	Numerical Methods 1 Pavel Váchal Pavel Váchal (Gar.)	Z,ZK	4	2+2	L	PV
01VYMA	Selected Topics in Mathematics Ji í Mikyška <b>Ji í Mikyška</b> Ji í Mikyška (Gar.)	Z,ZK	4	2+2	L	PV

Characteristics of the courses of this group of Study Plan: Code=BSMALA Name=BS - analýza a algebra

01DIFR	Differential Equations	Z.ZK	4
• • • • • • •	s introduction in the solution of ordinary differential equations. It contains a survey of equation types solvable analytically, ba	1 1	-
	ations and introduction in the theory of boundary-value problems.		ory, solution (
01LALA	Linear Algebra A 1, Examination	ZK	5
01LAA2	Linear Algebra A2	Z,ZK	6
	ted to the theory of linear operators on vector spaces (mainly equipped with scalar product). In the same time we introduce		-
01LALB		ZK	3
-	Linear Algebra B 1, Examination		-
01LAB2	Linear Algebra B2	Z,ZK	4
	arizes the most important notions and theorems related to the matrix theory, to the study of vector spaces with a scalar prod		-
01LAP	Linear Algebra Plus Arizes the most important notions and theorems related to the study of vector spaces.	Z,ZK	5
		7	4
01LA1	Linear Algebra 1	Z	1
	arizes the most important notions and theorems related to the study of vector spaces.	7	0
01LAL	Linear Algebra 1		2 Z Frahaniwa
heorem.	Linear dependence and independence. 3. Basis and dimension. 4. Subspaces of vector spaces. 5. Linear mappings. 6. Matri	ces of linear mappings.	7. Frobenius
	Linner Alechro 1	Z	2
01LNA1	Linear Algebra 1 Arizes the most important notions and theorems related to the study of vector spaces.		2
01LAZ		ZK	<u> </u>
-	Linear Algebra 1, Examination	ZK	2
	subject is the exam in Linear Algebra 1.	71/	
	Calculus A 1, Examination	ZK	6
	wledge about stuff lectured in the 01MAN course.	774	40
D1MAA2	Calculus A2	Z,ZK	10
,	ted mainly to the integral calculus of the real functions with one real variable and to the theory of the number series and the	· · · · · · · · · · · · · · · · · · ·	
01MAA3	Calculus A3	Z,ZK	10
	s and series, foundation of topology, and differential calculus of several variables.		
D1MAA4	Calculus A4	Z,ZK	10
-	ions of several variables, measure theory, foundation of differential and integral calculus on manifolds and complex analysis.		
01MANB	Calculus B 1, Examination	ZK	4
	wledge about stuff lectured in the 01MAN course.		
01MAB2	Calculus B2	Z,ZK	7
· · ·	l analysis, indefinite and definite integrals and series).		
01MAB3	Calculus B3	Z,ZK	7
	ted to functional sequences and series, theory of ordinary differential equations, theory of quadratic forms and surfaces, and g	eneral theory of metric s	paces, norme
and prehilbert?s sp			
01MAB4	Calculus B4	Z,ZK	7
	ted properties of functions of several variables, differential and integral calculus. Furthermore, the measure theory and theor		
D1MAP	Calculus Plus	ZK	6
D1MA1	Calculus 1	Z	4
	Il analysis (functions of one real variable, differential calculus).		
01MAN	Calculus 1	Z	4
Basic calculus (rea	l analysis, functions of one real variable, differential calculus).		
01MAZ	Calculus 1, Examination	ZK	4
01NUM1	Numerical Mathematics 1	Z,ZK	4
The course introdu	ces to numerical methods for solving the basic problems arising from technical and research problems. The accent is put on	a good understanding o	of the root of
neoretical methods	δ.		
2NME1	Numerical Methods 1	Z,ZK	4
here are explaine	d the basic principles of numerical mathematics important for numerical solving of problems important for physics and techno	ology. Methods for solution	on of tasks ve
mportant for physic	cists (ordinary differential equations, random numbers) are included in addition to the basic numerical methods. Integrated c	omputational environme	nt MATLAB i
	programming language as a demonstration tool. The seminars are held in computer laboratory.		
			4
01VYMA	Selected Topics in Mathematics	Z,ZK	4
01VYMA Fourier series: com	Selected Topics in Mathematics plete orthogonal systems, expansion of functions into Fourier series, trigonometric Fourier series and their convergence. Com Cauchy's theorem, Cauchy's integral formula, singularities, Laurent series, residue theorem.		

## Code of the group: BSJAZYKY

Name of the group: BS - languages

Requirement credits in the group:

Requirement courses in the group: In this group you have to complete at least 2 courses Credits in the group: 0

Note on the group:

Name of the course / Name of the group of courses<br/>(in case of groups of courses the list of codes of their<br/>members)<br/>Tutors, authors and guarantors (gar.)CompletionCreditsScopeSemesterRole04AMZKEnglish for Intermediate Students Examination<br/>Jana Ková ová, Slav na Brownová, Hana ápová Jana Ková ová Hana<br/>ápová (Gar.)ZK4ZPV

04APZK	English for Advanced Students Examination Slav na Brownová, Darren Copeland	ZK	5	Z	PV
04CESMZK	Czech for Intermediate Students Examination Jana Ková ová Jana Ková ová	ZK	4	Z	PV
04CESPZK	Czech for Foreign Students - Advanced Examination Jana Ková ová	ZK	5	Z	PV
04FMZK	French for Intermediate Students Examination V ra Šlechtová V ra Šlechtová (Gar.)	ZK	4	Z	PV
04FPZK	French for Intermediate Students Examination V ra Šlechtová V ra Šlechtová (Gar.)	ZK	5	Z	PV
04FZZK	French for Beginners Examination V ra Šlechtová V ra Šlechtová (Gar.)	ZK	3	L	PV
04NMZK	German for Intermediate Students Examination Miloslava echová Miloslava echová Miloslava echová (Gar.)	ZK	4	Z	PV
04NPZK	German for Advanced Students Examination Miloslava echová Miloslava echová Miloslava echová (Gar.)	ZK	5	Z	PV
04RMZK	Russian for Intermediate Students Examination Zhanna Isaeva Jana Ková ová Zhanna Isaeva (Gar.)	ZK	4	Z	PV
04RPZK	Russian for Intermediate Students Examination Zhanna Isaeva Zhanna Isaeva (Gar.)	ZK	5	Z	PV
04RZZK	Russian for Beginners Examination Zhanna Isaeva Miloslava echová Zhanna Isaeva (Gar.)	ZK	3	L	PV
04SMZK	Spanish for Intermediate Students Examination Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)	ZK	4	Z	PV
04SPZK	Spanish for Advanced Students Examination Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)	ZK	5	Z	PV
04SZZK	Spanish for Beginners Examination Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)	ZK	3	L	PV

#### Characteristics of the courses of this group of Study Plan: Code=BSJAZYKY Name=BS - languages

	t the courses of this group of Study Plan: Code=BSJAZYKY Name=BS - languages	<u> </u>	
04AMZK	English for Intermediate Students Examination	ZK	4
	the examination as given by the study plan. The examination covers the 04AM1, 04AM2, and 04AM3 courses and consists		(100 min) and
	tudent is expected to master the AM syllabus and demonstrate the ability to apply their knowledge gained in the three Eng	lish courses.	
04APZK	English for Advanced Students Examination	ZK	5
The course content is	the examination as given by the study plan. The student is supposed to demonstrate mastering the 04AP3 syllabus and the	e ability to apply their l	knowledge
obtained in the three (	4AP courses. The examination consists of 2 parts - written (110 min) and oral (30 min) and includes also oral presentation	of a topic from the stu	ident's field of
study.			
04CESMZK	Czech for Intermediate Students Examination	ZK	4
The course content is	he examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of the	04CESM1,2,3 course	es and can only
be taken after success	ful completion of the 3 courses. Detailed information is to be obtained from the teacher.		
04CESPZK	Czech for Foreign Students - Advanced Examination	ZK	5
The course content is	the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of the	∍ 04CESP1,2,3 course	es and can only
be taken after success	ful completion of the 3 courses. Detailed information is to be obtained from the teacher.		
04FMZK	French for Intermediate Students Examination	ZK	4
The content is the exa	, mination as given by the study programme. The whole French programme is ended with an examination covering the conte	ents of FM1-FM3. The	examination
consists of a written a	nd oral part and is organized according to Examination Instructions, a document available on the web.		
04FPZK	French for Intermediate Students Examination	ZK	5
-	gram is ended with an examination covering the contents of FP1-FP3. The examination consists of a written and/or an oral	1 1	-
•	ns, a document available on the web. Assessment of the presentation is included into the examination grading.	,	<b>y</b>
04FZZK	French for Beginners Examination	ZK	3
-	mination as given by the study plan. The course is terminated with an examination consisting of oral and written part. The $\epsilon$		-
	tion. Its content covers the levels FZ1 - FZ5.		
04NMZK	German for Intermediate Students Examination	ZK	4
-	the examination as given by the study plan. The whole German for Intermediate Students Course is completed by an examination		
	ne courses 04NM1 - 04NM3. The oral part follows after passing the written part successfully and after obtaining the 04NM3 a	•	•
is to be obtained from			
04NPZK	German for Advanced Students Examination	ZK	5
-	the examination as given by the study plan. The whole German for Advanced Students Course is completed by an examination	1 1	-
	he courses 04NM1 - 04NM3. The oral part follows after passing the written part successfully and after obtaining the 04NP3	•	•
	tained from the teacher.	0	
04RMZK	Russian for Intermediate Students Examination	ZK	4
• • • • • • • • • • • • • • • • • • • •	the examination as given by the study plan. The course is completed by taking a written and oral examination testing the ki	1 1	auired in RM1
	igible for the oral examination only after a prior pass in RM3 and a successful written examination. Students are given instr	-	-
04RPZK	Russian for Intermediate Students Examination	ZK	5
	the examination as given by the study plan. The course is completed by taking a written and oral examination testing the ki	1 1	-
	gible for the oral examination only after a prior pass in RP3 and a successful written examination. Students are given instru	•	•
04RZZK	Russian for Beginners Examination	ZK	3
-	the examination as given by the study plan. The course is completed by taking a written and oral examination testing the ki	1 1	•
	gible for the oral examination only after a prior pass in RZ5 and a successful written examination. Students are given instru	•	•
04SMZK	Spanish for Intermediate Students Examination	ZK	4
	the examination as given by the study plan. 04SMZK examination consists of two parts - written and oral; to be eligible for the approximation of the part of the study plan. 04SM2 or the second state of the	ine written part, studel	nis will nave
obtained non-graded a	ssessment for course 04SM3.Oral examination follows the written part.		

04SPZK	Spanish for Advanced Students Examination	ZK	5			
The course content is the examination as given by the study plan. Examination 04SPZK consists of two parts, namely oral and written. The prerequisite for admission to oral part is						
having passed the writt	having passed the written test. Examination content is based on syllabi of courses SP1, SP2, and SP3 or on an individual study plan of the student.					
04SZZK	Spanish for Beginners Examination	ZK	3			
The course content is the	The course content is the examination as given by the study plan. Examination consists of two parts - written and oral. Student can register for oral examination only if he/she has					
passed the written exar	nination test.					

Name of the block: Elective courses Minimal number of credits of the block: 0 The role of the block: V

Code of the group: BSVOLPREDM Name of the group: BS - volitelné p edm ty Requirement credits in the group: Requirement courses in the group: Credits in the group: 0 Note on the group:

Note on the g	•	-			1	
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
12AUX	Administration of UNIX System Milan Ši or Milan Ši or (Gar.)	KZ	2	2+0	L	V
01ALG	Algebra Pavel Š oví ek	ZK	4	4+0	Z	V
01ALGE	Algebra Zuzana Masáková Zuzana Masáková Zuzana Masáková (Gar.)	Z,ZK	6	4+1		V
11ANEL	Linear Circuit Analysis Pavel Jiroušek Pavel Jiroušek (Gar.)	Z,ZK	4	4	Z	V
15CHEM	Analytical Calculations and Chemometry Principals Ji í Zima Ji í Zima Ji í Zima (Gar.)	ZK	2	2+0	Z	V
04ABZK	English - State Examination Jana Ková ová	ZK	5	2	L	V
04AM1	English for Intermediate Students M1 Jana Ková ová	Z	1	0+2	Z	V
04AM2	English for Intermediate Students M2 Jana Ková ová	Z	1	0+2	L	V
04AM3	English for Intermediate Students M3 Jana Ková ová Hana ápová (Gar.)	Z	1	0+2	Z	V
04AP1	English for Advanced Students P1	Z	1	0+2	Z	V
04AP2	English for Advanced Students P2	Z	1	0+2	L	V
04AP3	English for Advanced Students P3	Z	1	0+2	Z	V
16APLB	Application of Ionizing Radiation in Analytical Methods Tomáš echák	ZK	5	4+0	L	V
12APL	Application of Lasers Helena Jelínková, Alexandr Jan árek Helena Jelínková Helena Jelínková (Gar.)	Z,ZK	2	2+0	Z	V
11APLG	Applications of Group Theory in Solid State Physics Zden k Pot ek Zden k Pot ek Zden k Pot ek (Gar.)	ZK	2	2	Z	V
02AMS	Atomic and Molecular Spectroscopy Svatopluk Civiš Svatopluk Civiš (Gar.)	Z,ZK	4	2+2	Z	V
04CESM1	Czech for foreigners - Intermediate Jana Ková ová	Z	1	0+2	Z	V
04CESM2	Intermediate Czech 2 Jana Ková ová	Z	1	0+2	L	V
04CESM3	Intermediate Czech 3 Jana Ková ová Jana Ková ová (Gar.)	Z	1	0+2	Z	V
04CESP1	Czech for Foreign Students - Advanced Examination Jana Ková ová	Z	1	0+2	Z	V
04CESP2	Czech for Foreigners - Advanced Jana Ková ová	Z	1	0+2	L	V
04CESP3	Czech for Foreigners - Advanced Jana Ková ová	Z	1	0+2	Z	V
15DALCH	History of Alchemy and Chemistry Vladimír Karpenko Vladimír Karpenko Vladimír Karpenko (Gar.)	ZK	2	2+0	Z	V
02DEF1	History of Physics 1 Igor Jex, Miroslav Myška Miroslav Myška Igor Jex (Gar.)	Z	2	2+0	Z	V
02DEF2	History of Physics 2 Igor Jex Miroslav Myška Igor Jex (Gar.)	Z	2	2+0	L	V

01DEM	History of Mathematics Lubomíra Dvo áková Lubomíra Dvo áková (Gar.)	Z	1	0+2	L	V
02DRG	Differential Equations, Symmetries and Groups Libor Šnobl Martin Štefa ák Libor Šnobl (Gar.)	Z	4	2+2	Z	V
01DIM1	Discrete Mathematics 1 Lubomíra Dvo áková, Edita Pelantová, Zuzana Masáková Lubomíra Dvo áková Zuzana Masáková (Gar.)	Z	2	2P+0C	z	v
01DIM2	Discrete Mathematics 2 Edita Pelantová, Zuzana Masáková Zuzana Masáková Zuzana Masáková (Gar.)	Z	2	2P+0C	L	v
01DIM3	Discrete Mathematics 3	Z	2	2+0	Z	V
00EKOT	Economy in Technology Jana Ková ová	Z	1	2+0		V
11ELEA	Instrumentation and Measurement Pavel Jiroušek Pavel Jiroušek Pavel Jiroušek (Gar.)	Z,ZK	2	2	L	v
14ELMI	Electron Microscopy	Z,ZK	3	2+0		V
12EGS1	English Graduate Standard 1 Ivan Procházka	KZ	4	0+4	L	V
18ESPG1	European Computer Driving Licence 1	Z	2	0+2	Z	V
18ESPG2	European Computer Driving Licence 2	Z	2	0+2	L	V
16EPAM	Exact Methods in Research of Historic Monuments Ladislav Musilek Ladislav Musilek (Gar.)	ZK	2	2+0	Z	V
02EXF1	Experimental Physics 1 Jan epila	Z	2	2+0	L	V
02EXF2	Experimental Physics 2	ZK	2	2+0	Z	V
17ENF	Experimental Neutron Physics Jan Rataj	KZ	2	2+1	L	v
04FM1	French for Intermediate Students M1	Z	1	0+2	Z	V
04FM2	French for Intermediate Students M2	Z	1	0+2	L	V
04FM3	French for Intermediate Students M3 V ra Šlechtová (Gar.)	Z	1	0+2	Z	V
04FP1	French for Advanced Students P1 Michal Beneš	Z	1	0+2	Z	V
04FP2	French for Advanced Students P2 V ra Šlechtová	Z	1	0+2	L	V
04FP3	French for Advanded Students P3 V ra Šlechtová (Gar.)	Z	1	0+2	Z	V
04FZ1	French for Beginners Z1 V ra Šlechtová	Z	1	0+4	L	V
04FZ2	French for Beginners Z2 Michal Beneš	Z	1	0+4	Z	V
04FZ3	French for Beginners Z3 V ra Šlechtová	Z	1	0+4	L	V
04FZ4	French for Beginners Z4 V ra Šlechtová (Gar.)	Z	1	0+4	Z	V
04FZ5	French for Beginners Z5 V ra Šlechtová V ra Šlechtová (Gar.)	Z	1	0+4	L	V
01FKP	Functions of Complex Variable Severin Pošta, Pavel Š oví ek Pavel Š oví ek (Gar.)	ZK	2	2+0	Z	V
01FKPB	Functions of Complex Variable B Pavel Š oví ek	Z	2	2+0	Z	V
01FAN1	Functional Analysis 1 Pavel Š oví ek Pavel Š oví ek Pavel Š oví ek (Gar.)	Z,ZK	4	2+2		V
01FA1	Functional Analysis 1 Pavel Š oví ek	Z,ZK	3	2+1	Z	V
01FA2	Functional Analysis 2 Pavel Š oví ek Pavel Š oví ek (Gar.)	Z,ZK	4	2+2	L	V
02PRA1	<b>Experimental Laboratory 1</b> Libor Škoda, Katarína K ížková Gajdošová, Barbara Antonina Trzeciak, Jaroslav Biel ík <b>Jaroslav Biel ík</b> Jaroslav Biel ík (Gar.)	KZ	6	0+4	Z	V
02PRA2	Experimental Laboratory 2 Libor Škoda, Jaroslav Biel ík Jaroslav Biel ík (Gar.)	KZ	6	0+4	L	V
02FYS1	Physical Seminar 1 Martin Štefa ák Vojt ch Svoboda (Gar.)	Z	2	0+2	Z	V
02FYS2	Physical Seminar 2 Jan epila	Z	2	0+2	L	V
01GTDR	Geometric Theory of Ordinary Differential Equations Michal Beneš Michal Beneš Michal Beneš (Gar.)	Z	2	0+2	Z	V
12INS1	Information Systems 1	Z,ZK	2	2	Z	V
12INS2	Information Systems 2 Antonín Novotný	Z,ZK	2	2	L	v

Database         Database         Database         Database         Database         Database         Database           01JEPR         Simple Compilers         Simple Compilers         ZK         2         2         L         V           01JEPR         Simple Compilers         ZK         2         2         L         V           01JEPR         Simple Compilers         ZK         2         2         L         V           04AKS         English Conversation         and (data)         ZK         3         2PH1C         Z         V           04AKS         English Conversation         and (data)         Keep (data)         Z         0         0         2         V         V           02LCF1         Experiment Laboratory V         Gata         ZZK         3         2+1         Z         V           02LCF2         Experiment Laboratory V         Keep (data)         ZZK         3         2+1         Z         V           12LT2         Laber Technique 1         Keep (data)         ZZK         3         2+1         L         V           12LT1         Laber Technique 2         ZZK         3         2+1         L         V           12LT2	16ZJTB	Nuclear Energy Facilities and Accelerators	ZK	2	2+0	Z	v
Toron B By Constraints         Constraints <thconstraints<< td=""><td></td><td>Nuclear Reactors</td><td></td><td></td><td></td><td></td><td></td></thconstraints<<>		Nuclear Reactors					
Once://r         Zoon's uits Zoon & uits Zoon & uits (Scie)         Z         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         V           04AKS         English Concertsention         Z         1         042         L         V           02KF         Quantum Physics         File Preventemental Leboratory 1         Z         2         042         L         V           02LOF1         Experimental Leboratory 2         Z         042         L         V         V           02LOF2         Experimental Leboratory 1         Z         Z         040         L         V           12LT1         Lasser Role at Mode Kale A whole A (Gar)         ZZK         3         241         Z         V           12LAS         Lasser Solam Stark Role at Wole A (Gar)         ZZK         3         241         Z         V           01LP         Lasser Solam Stark Role at Wole A (Gar)         ZZK         4         2+2         V         V           12LAS         Lasser Solam Stark Role at Wole (Gar)         ZZK         4         2+2         V         V	-			_	-		
NUME         Just State          12L12         Lases		Zden k ulík <b>Zden k ulík</b> Zden k ulík (Gar.)					V
Dark for and sore for and (Ser.)         L         I         <	16KPR	Jana Votrubová Jana Votrubová Jana Votrubová (Gar.)	ZK	2	2+0	Z	V
Outside         Project Number 1         Description of the interval	04AKS	English Conversation Jana Ková ová Jana Ková ová (Gar.)	Z	1	0+2	L	V
Calcel 1         Janoslav Bal R. Janoslav Bal R. (Gar.)         C         L <thl< t<="" td=""><td>02KF</td><td></td><td>Z,ZK</td><td>3</td><td>2P+1C</td><td>Z</td><td>v</td></thl<>	02KF		Z,ZK	3	2P+1C	Z	v
Order         Jaroslav Biel & Jaroslav Biel & Kologar, J.         L         L         Ort         L         D         D           12LT1         Laser Chrinique 1         Laser Chrinique 2         ZZK         3         241         L         V           12LT2         Laser Chrinique 2         ZZK         3         241         L         V           12LT3         Laser Systems         Kube ek Veder Kube ek Veder (Gar.)         ZZK         3         241         L         V           01LIP         Unear Programming         ZZK         4         242         L         V           18MAK1         Macrosconomics 1         ZZK         4         242         Z         V           18MAK2         Mathematical Economics 2         ZZK         5         242         Z         V           01MASC         Mathematical Economics 2         ZZK         5         242         Z         V           01MASC         Mathematical Fond Hugb Conol Gaur.)         Z         1         0+1         V           00MAM1	02LCF1	Experimental Laboratory 1 Jaroslav Biel ík Jaroslav Biel ík (Gar.)	Z	2	0+2	Z	V
12LT1         Laser Technique 1 Weber Kabe ek Woler Kabe ek Voler         Z.KK         3         2+1         Z         v           12LT2         Laser Technique 2 Meten Alefhowd         Z.KK         2         2+0         L         v           12LAS         Laser Systems Volen Kabe ek Woler (Kabe ek Voler (Gar.)         Z.ZK         3         2+1         L         v           01LIP         Linear Programming Am Nobe extende and Bandin Am Vole (Gar.)         Z.ZK         4         2+2         L         v           18MAK1         Macroeconomics 1 Macroeconomics 2         Z.XK         4         2+2         Z         v           18MAK2         Macroeconomics 2         Z.ZK         4         2+2         Z         v           18MAK2         Macroeconomics 2         Z.ZK         5         2+2         Z         v           18EKO1         Mathematical Economics 1         ZZK         5         2+2         L         v           18EKO2         Mathematical Economics 1         ZZK         5         2+2         L         v           00MAM1         Essentials of High School Course 1         Z         1         0+1         v           00MAM2         Essentials of High School Course 1         Z         2	02LCF2	Experimental Laboratory 2 Jaroslav Biel ik Jaroslav Biel ik (Gar.)	Z	2	0+2	L	V
Helena         Jelena         Jelena<	12LT1	Laser Technique 1	Z,ZK	3	2+1	Z	V
12LAS         Laser Systems Water Web et Wicker Kube et Viciour Kube et Viciour Kube et (Gar.)         Z.ZK         3         2+1         L         v           01LIP         Linear Programming Jun Web et Mich et Wicker Kube et Viciour Kube et (Gar.)         Z.ZK         3         2+1         Z         v           18MAK1         Macroeconomics 1 Quarge Van Tran Quarg Van Tran Quarg Van Tran (Gar.)         Z.ZK         4         2+2         L         v           19MAK2         Macroeconomics 2 Quarge Van Tran Quarg Van Tran Quarg Van Tran (Gar.)         Z.ZK         4         2+2         V           01MAPR         Markov processes Jun Vybrai Jan Vybrai Jon Vybrai (Gar.)         Z.ZK         5         2+2         L         v           18EKO2         Mathematical Statistics - Seminar OndMASC         Z.ZK         5         2+2         L         v           00MAM1         Essentials of High School Course 1         Z         1         0+1         v           00MAM2         Essentials of High School Mather Oruse 2         Z         1         0+1         v           01MMFV         Mathematical Physics         Z.ZK         5         2P+2C         Z         v           01MASC         Mathematical J. Michyber Morgan         Z         1         0+1         v	12LT2		Z,ZK	2	2+0	L	v
01LP         Linear Programming An Webe (Gar.)         Z,ZK         3         2+1         Z         V           18MAK1         Macroeconomics 1 Quang Van Tran Quang Van Tran Quang Van Tran (Gar.)         Z,ZK         4         2+2         L         V           18MAK2         Macroeconomics 2 Quang Van Tran Quang Van Tran (Gar.)         Z,ZK         4         2+2         Z         V           01MAPR         Markov processes Ant Nydrid Jan Vybral (Gar.)         Z,ZK         4         2+2         Z         V           18EK02         Mathematical Economics 1         Z,ZK         5         2+2         L         V           00MAM1         Essentials of High School Course 1         Z         1         0+1         V           00MAM2         Essentials of High School Course 1         Z         1         0+1         V           01MMPV         Mathematical Physics         Z,ZK         6         4+2         L         V           01MMPV         Mathematical Models of Groundwater Flow         KZ         2         2+0         L         V           01MMFV         Mathematical Physics         Z,ZK         5         2P+2C         Z         V           01MMF         Methods of Mathematical Physics         Z,ZK	12LAS	Laser Systems	Z,ZK	3	2+1	L	V
18MAK1         Macrosconomics 1 (Marceconomics 2) (Jan Probability Tan Quang Van Tan Quang Van Tan (Gar.)         Z,ZK         4         2+2         L         v           18MAK2         Macrosconomics 2 (Jang Vinit) Jan Vybiral Jan Vybiral (Gar.)         Z,ZK         4         2+2         Z         v           01MAPR         Markov processes Jan Vybiral Jan Vybiral Jan Vybiral (Gar.)         Z,ZK         5         2+2         Z         v           18EK01         Mathematical Economics 1         Z,ZK         5         2+2         L         v           18EK02         Mathematical Statistics - Seminar Tamas Hobza Tomas Hobza Tomas Hobza (Gar.)         Z         1         0+1         v         v           00MAM1         Essentials of High School Currse 1 Dawd 8: Marin Steh ák         Z         1         0+1         v         v           00MAM2         Essentials of High School Mathematical Mobbal Gar.)         Z         1         0+1         v         v           01MMPV         Mathematical Mobbal Gol Groundwater Flow         KZ         2         2+0         L         v           01MMR1         Metroconomics 1 Ouang Van Tan Quang Van Tan (Gar.)         Z,ZK         5         2P+2C         L         v           18MiK1         Micoreconomics 1 Ouang Van Tan Quang Van Tan (Gar.) </td <td>01LIP</td> <td>Linear Programming</td> <td>Z,ZK</td> <td>3</td> <td>2+1</td> <td>Z</td> <td>V</td>	01LIP	Linear Programming	Z,ZK	3	2+1	Z	V
18MAK2         Macrosconomics 2 Oung Wan Tran Quang Wan Tran Quang Wan Tran (Gar.)         Z,ZK         4         242         Z         v           01MAPR         Markov processes Jan Vybiral Jan Vybiral (Gar.)         Z,ZK         4         242         v           18EK01         Mathematical Economics 1         Z,ZK         5         242         L         v           18EK02         Mathematical Statistics - Seminar Tomas Hobaz Tomas Hobaz Tomas Hobaz (Gar.)         Z         1         041         v         v           00MAM1         Essentials of High School Course 1 Dawd 8: Severin Pota Ludds Herihan (Gar.)         Z         1         041         v         v           00MAM2         Essentials of High School Mathematical Multiplea (Gar.)         Z         1         041         v         v           01MMFV         Mathematical Modes of Gardundward Flow         KZ         2         240         L         v           01MMFV         Methods of Mathematical Physics or et al.         Z,ZK         6         442         L         v         v           18MIK2         Microsconomics 1 Oung Van Tran Quarg Van Tran (Gar.)         Z,ZK         5         2P+2C         L         v           18MIK2         Microsconomics 1 Oung Van Tran Quarg Van Tran (Gar.)         Z,ZK	18MAK1	Macroeconomics 1	Z,ZK	4	2+2	L	v
01MAPR         Markov processes and yokina' Jan yokina' Jan yokina' (Gar.)         Z.ZK         4         2+2         v           18EK01         Mathematical Economics 1         Z.ZK         5         2+2         Z         v           18EK02         Mathematical Economics 2         Z,ZK         5         2+2         L         v           01MASC         Mathematical Statistics - Seminar Tomas Hobas Tomas Hobas Tomas Hobas (Gar.)         Z         1         0+1         v           00MAM1         Essentials of High School Course 1 David B = Marin State ak         Z         1         0+1         v           00MAM2         Essentials of High School Auth Course 2 Lukas Henban Soverin Potia Lukäs Henban (Gar.)         Z         1         0+1         v           01MMPV         Mathematical Physics Authors Soverin Potia Lukäs Henban (Gar.)         Z,ZK         6         4+2         L         v           01MMF         Methods of Mathematical Physics Authors Sover ak         Z,ZK         5         2P+2C         Z         v           18MIK1         Microeconomics 1 Ouang Van Tan (Gar.)         Z,ZK         5         2P+2C         L         v           11MIK         Logical Circuits and Microprocessors Aurochak deck methok Pavel Jirouske (Gar.)         Z,K         4         4         L<	18MAK2	Macroeconomics 2	Z,ZK	4	2+2	Z	v
18EKO1         Mathematical Economics 1         Z,ZK         5         2+2         Z         v           18EKO2         Mathematical Economics 2         Z,ZK         5         2+2         L         v           01MASC         Mathematical Economics 2         Z,ZK         5         2+2         L         v           00MAM1         Essentials of High School Course 1         Z         1         0+1         v           00MAM2         Essentials of High School Course 1         Z         1         0+1         v           00MAM2         Essentials of High School Course 1         Z         1         0+1         v           00MAM2         Essentials of High School Course 1         Z         1         0+1         v           01MMPV         Mathematical Models of Groundwater Flow         KZ         2         2+0         L         v           01MMF         Methods of Mathematical Physics         Z,ZK         5         2P+2C         Z         v           18MIK1         Quarg Van Tan Quarg Van Tan Gar.)         Z,ZK         5         2P+2C         L         v           11MIK         Logical Circuits and Microprocessors 2         Z,ZK         4         4         L         v	01MAPR	Markov processes	Z,ZK	4	2+2		V
OtMASC     Mathematical Statistics - Seminar Tamis Hobra Tomás Hobra Tomás Hobra (Gar.)     Z     2     0+2     v       00MAM1     Essentials of High School Course 1 Dawid B e Martin Stefa ak Martin Stefa ak     Z     1     0+1     v       00MAM2     Essentials of High School Course 1 Dawid B e Martin Stefa ak     Z     1     0+1     v       00MAM2     Essentials of High School Course 1 Dawid B e Martin Stefa ak     Z     1     0+1     v       01MMPV     Mathematical Models of Groundwater Flow J i Mikyška J i Mikyška (Gar.)     KZ     2     2+0     L     v       01MMF     Pavel S ovi ek     Szzzk     5     2P+2C     Z     v       18MIK1     Ourge yan Tano Guang Van Tran (Gar.)     Z,ZK     5     2P+2C     L     v       11MIK     Logical Circuits and Microprocessors Pavel Jiroušek Pavel Jiroušek Pavel Jiroušek (Gar.)     ZK     4     4     L     v       12MPR1     Microprocessors 1 Microprocessors 2 Jan Proška, Martin Michi Jan Proška (Gar.)     ZK     2     2+0     L     v       12MOF     Molecular Physics Jan Proška, Eduard Hulicus Jan Proška (Gar.)     ZK     2     2+0     V       04NM1     German for Intermediate Students M1     Z     1     0+2     V       04NM1     German for Intermediate Students M2 Jan epila	18EKO1		Z,ZK	5	2+2	Z	V
OTMAGDTomak Hobes Tomás Hobes Tomás Hobes (Gar.)ZZOH2V00MAM1Essentials of High School Course 1 David B e Martin Stefe ákZ10+1V00MAM2Essentials of High School Math Course 2 Ludas Henton Sevent PostaZ10+1V01MMPVMathematical Models of Groundwater Flow M Himpska J I Mingka (Jan.)KZ22+0LV01MMFMethods Sevent PostaLudas Henton (Gar.)KZ22+0LV01MMFMethods of Mathematical Physics Pavel S ovi ekZ,ZK64+2LV18MIK1Microeconomics 1 Ouang Van Tan (Gar.)Z,ZK52P+2CZV11MIKLogical Circuits and Microprocessors Pavel Jinoušek (Gar.)Z,ZK44LV12MPR1Microprocessors 1 Microprocessors 2 Jan Prosta, Martin Michl Jan Prosta Eduard Hulicius (Gar.)ZK22+0LV12MOFMatechanical Hudin Jan Prosta Eduard Hulicius (Gar.)ZK22+0LV12MPR2Miroslav ech Miroslav ech (Gar.)ZK22+0LV12MOFMatechanical Analysis ToolsZ22VV12MOFNanotechnology Jan Prosta, Eduard Hulicius (Gar.)ZK22+0VV12MOFMarin Michl Martin Michl Jan Prosta Eduard Hulicius (Gar.)ZK22+0VV12MOFMiroslaw ech Miroslaw echová (Gar.)Z10+2Z<	18EKO2	Mathematical Economics 2	Z,ZK	5	2+2	L	V
00MAM1     Essentials of High School Course 1     Z     1     0+1     V       00MAM2     Essentials of High School Math Course 2     Z     1     0+1     V       00MAM2     Essentials of High School Math Course 2     Z     1     0+1     V       01MMPV     Mathematical Models of Groundwater Flow J: I Mityska U / Mityska (Gar.)     KZ     2     2+0     L     V       01MMF     Methods of Mathematical Physics     Z,ZK     6     4+2     L     V       18MIK1     Microeconomics 1 Quang Van Tan Quang Van Tan (Gar.)     Z,ZK     5     2P+2C     Z     V       11MIK     Logical Circuits and Microprocessors Pavel S ovi ek     Z,ZK     4     4     L     V       12MPR1     Microprocessors 1 Microprocessors 2     Microprocessors 2     ZKK     2     2+0     L     V       12MOF     Microprocessors 2     Microprocessors 2     ZK     2     2+0     L     V       12MOF     Microprocessors 2     Microprocessors 2     ZK     2     2+0     L     V       12MOF     Microprocessors 2     Microprocessors 2     ZK     2     2+0     Z     V       12MOF     Microprocessors 2     Microprocessors 2     ZK     2     2+0     Z     V	01MASC		Z	2	0+2		V
00MAM2Essentials of High School Math Course 2 Lukáš Heriban Ger.)Z10+1v01MMPVMathematical Models of Groundwater Flow J. i Mityška J. i Mityška (Gar.)KZ22+0Lv01MMFMethods of Mathematical Physics Pavel S ovi ekZ,ZK64+2Lv18MIK1Ouroeconomics 1 Ouroeg Van Tran Quarg Van Tran (Gar.)Z,ZK52P+2CZv18MIK2Microeconomics 2 Ourag Van Tran Quarg Van Tran (Gar.)Z,ZK52P+2CLv11MIKEogical Circuits and Microprocessors Pavel Jousike Pavel Jousik	00MAM1	Essentials of High School Course 1	Z	1	0+1		V
01MMPVMathematical Models of Groundwater Flow J i Minyska J i Minyska (Gar.)KZ22+0Lv01MMFMethods of Mathematical Physics Pavel S ovi ekZ,ZK64+2Lv18MIK1Microeconomics 1 Quang Van Tran Quang Van Tran (Gar.)Z,ZK52P+2CZv18MIK2Microeconomics 2 Quang Van Tran Quang Van Tran (Gar.)Z,ZK52P+2CLv11MIKLogical Circuits and Microprocessors Pavel Juroske, Pavel Juroske, Pavel Juroske, KGar.)Z,ZK44Lv12MPR1Microprocessors 1 Microslav ech Miroslav ech (Gar.)ZK44+0Zv12MPR2Microprocessors 2 Miroslav ech Miroslav ech (Gar.)ZK22+0Lv12MOFMolecular Physics Jan Proška, Eduard Hulicius Jan Proška (Gar.)ZK22+0Lv12NTNanotechnology Jan Proška, Eduard Hulicius Jan Proška (Gar.)ZK22+0Vv04NM1German for Intermediate Students M1Z10+2Zvv04NM3German for Intermediate Students M2 Mitoslaw echová Miloslav echová (Gar.)Z10+2Zv04NP2German for Advanced Students M2 Miloslaw echová (Gar.)Z10+2Zv04NM2German for Intermediate Students M2 Miloslaw echová (Gar.)Z10+2Zv04NM2German for Advanced Students M2 Miloslaw echová (Gar.)Z10	00MAM2	Essentials of High School Math Course 2	Z	1	0+1		V
01MMFMethods of Mathematical PhysicsZ,ZK64+2Lv18MIK1Microeconomics 1 Ouang Van Tran Quang Van Tran (Gar.)Z,ZK52P+2CZv18MIK2Microeconomics 2 Quang Van Tran Quang Van Tran (Gar.)Z,ZK52P+2CLv11MIKLogical Circuits and Microprocessors Pavel Jiroušek Pavel Jiroušek (Gar.)Z,ZK44Lv12MPR1Microprocessors 1 Microprocessors 2 Miroslav ech Miroslav ech (Gar.)ZK44+0Zv12MOFMicroprocessors 2 Miroslav ech Miroslav ech (Gar.)ZK22+0Lv12MOFMolecular Physics Jan Proška, Eduard Hulicus Jan Proška (Gar.)ZK22+0Lv12NTNanotechnology Jan epila Jan epilaJan Proška Eduard Hulicus Gar.)ZK22+0Vv04NM1German for Intermediate Students M1Z10+2Zvv04NM2German for Intermediate Students M2 Mitoslav echová Miloslava echová (Gar.)Z10+2Zv04NP2German for Advanced Students P1Z10+2Zvv04NP3German for Advanced Students P2 Mitoslava echová Miloslava echová (Gar.)Z10+2Zv04NP2German for Advanced Students P3 Mitoslava echová Miloslava echová (Gar.)Z10+2Zv04NP3German for Advanced Students P2 Mitoslava echová Miloslava echová (Gar.)Z<	01MMPV	Mathematical Models of Groundwater Flow	KZ	2	2+0	L	V
18MIK1Microeconomics 1 Quary fan Quan Tan Quang Van	01MMF	Methods of Mathematical Physics	Z,ZK	6	4+2	L	V
18MIK2Microeconomics 2 Quang Van Tran Quang Van Tran (Gar.)Z.ZK52P+2CLv11MIKLogical Circuits and Microprocessors Pavel Jiroušek, Pet Levinský Pavel Jiroušek Pavel Jiroušek (Gar.)Z,ZK44Lv12MPR1Microprocessors 1 Microprocessors 2 Miroslav ech Miroslav ech (Gar.)ZK44+0Zv12MOFMicroprocessors 2 Miroslav ech Miroslav ech (Gar.)ZK22+0Lv12MOFMolecular Physics Jan Proška, Martin Micht Martin Micht Jan Proška (Gar.)ZK22+0Lv12NTNanotechnology Jan Proška, Eduard Hulicius Jan Proška Eduard Hulicius (Gar.)ZK22+0Vv02NSADSimulations and Data Analysis Tools Jan epilaZ10+2Zvv04NM1German for Intermediate Students M1Z10+2Lvv04NM2German for Intermediate Students M2 Miloslava echová Miloslava echová (Gar.)Z10+2Zv04NP1German for Advanced Students P1Z10+2Zvv04NP2German for Advanced Students P3 Miloslava echová (Gar.)Z10+2Zvv04NP3German for Advanced Students P3 Micoslava echová (Gar.)Z10+2Zvv04NP3German for Advanced Students P3 Micoslava echová (Gar.)Z10+2Zvv04NP3German for Advanced Students P	18MIK1	Microeconomics 1	Z,ZK	5	2P+2C	Z	V
11MIKLogical Circuits and Microprocessors Paved Jiroušek, Pavel Jiroušek (Gar.)Z,ZK44Lv12MPR1Microprocessors 1 Miroslav ech Miroslav ech (Miroslav ech (Gar.)ZK44+0Zv12MPR2Microprocessors 2 Miroslav ech Miroslav ech (Gar.)ZK22+0Lv12MOFMolecular Physics Jan Proška, Martin Michl Martin Michl Jan Proška (Gar.)ZK22+0Lv12NTNanotechnology Jan Proška, Eduard Hulicius Jan Proška (Gar.)ZK22+0Zv02NSADSimulations and Data Analysis Tools Jan epilaZ22vv04NM1German for Intermediate Students M1Z10+2Zv04NM2German for Intermediate Students M2 	18MIK2	Microeconomics 2	Z,ZK	5	2P+2C	L	V
12MPR1Microprocessors 1 Miroslav ech Miroslav ech Miroslav ech (Gar.)ZK44+0Zv12MPR2Microprocessors 2 Miroslav ech Miroslav ech (Gar.)ZK22+0Lv12MOFMolecular Physics Jan Proška, Martin Michl Martin Michl Jan Proška (Gar.)ZK22+0Lv12NTNanotechnology Jan Proška, Eduard Hulicius Jan Proška (Gar.)ZK22+0Lv02NSADSimulations and Data Analysis Tools Jan epilaZ222vv04NM1German for Intermediate Students M1Z10+2Zvv04NM3German for Intermediate Students M2 Miloslava echová (Gar.)Z10+2Lv04NP1German for Intermediate Students M2 Miloslava echová (Gar.)Z10+2Zv04NP3German for Advanced Students P1Z10+2Zv04NP3German for Advanced Students P2 Miloslava echová (Gar.)Z10+2Lv04NP3German for Advanced Students P3 Miloslava echová (Gar.)Z10+2Zv04NP3German for Advance	11MIK	Logical Circuits and Microprocessors	Z,ZK	4	4	L	v
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12MOFMolecular Physics Jan Proška, Martin Michl Martin Michl Jan Proška (Gar.)ZK22+0Lv12NTNanotechnology Jan Proška, Eduard Hulicius Jan Proška Eduard Hulicius (Gar.)ZK22+0Zv02NSADSimulations and Data Analysis Tools Jan epilaZ22+0Zv04NM1German for Intermediate Students M1Z10+2Zv04NM2German for Intermediate Students M2 Miloslava echová (Gar.)Z10+2Lv04NM3German for Intermediate Students M2 Miloslava echová (Gar.)Z10+2Zv04NP1German for Intermediate Students M2 Miloslava echová (Gar.)Z10+2Zv04NP1German for Advanced Students P1Z10+2Zvv04NP2German for Advanced Students P2 Miloslava echová (Gar.)Z10+2Lv04NP3German for Advanced Students P3 Miloslava echová (Gar.)Z10+2Zv01NME2Numerical Methods 2 Miloslava echová (Gar.)KZ22+0Lv01NME2Numerical Methods 2 Miloslava echová (Gar.)KZ232+1Zv01NME2Ceneral Chemistry 1 Ord ej Holas, Petr Distler Volav uba Petr Distler (Gar.)Z32+1Zv	12MPR2	Microprocessors 2	ZK	2	2+0	L	V
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Jan epilaJan epilaImage: Constraint of the point		Simulations and Data Analysis Tools		2	2+0		V
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04NP1German for Advanced Students P1Z10+2ZV04NP2German for Advanced Students P2 Miloslava echováZ10+2LV04NP3German for Advanced Students P3 Miloslava echová Miloslava echová (Gar.)Z10+2ZV01NME2Numerical Methods 2 Michal Beneš Michal Beneš (Gar.)KZ22+0LV15CH1General Chemistry 1 Ond ej Holas, Petr Distler, Václav uba Petr Distler Petr Distler (Gar.)Z32+1ZV	04NM3	German for Intermediate Students M2	Z	1	0+2	Z	V
04NP2German for Advanced Students P2 Miloslava echováZ10+2LV04NP3German for Advanced Students P3 Miloslava echová Miloslava echová (Gar.)Z10+2ZV01NME2Numerical Methods 2 Michal Beneš Michal Beneš (Gar.)KZ22+0LV15CH1General Chemistry 1 Ond ej Holas, Petr Distler, Václav uba Petr Distler Petr Distler (Gar.)Z32+1ZV	04NP1		Z	1	0+2	Z	V
04NP3       German for Advanced Students P3 Miloslava echová Miloslava echová (Gar.)       Z       1       0+2       Z       V         01NME2       Numerical Methods 2 Michal Beneš Michal Beneš Michal Beneš (Gar.)       KZ       2       2+0       L       V         15CH1       General Chemistry 1 Ond ej Holas, Petr Distler, Václav uba Petr Distler Petr Distler (Gar.)       Z       3       2+1       Z       V	04NP2	German for Advanced Students P2		1	0+2		V
01NME2     Numerical Methods 2 Michal Beneš Michal Beneš Michal Beneš (Gar.)     KZ     2     2+0     L     V       15CH1     General Chemistry 1 Ond ej Holas, Petr Distler, Václav uba Petr Distler Petr Distler (Gar.)     Z     3     2+1     Z     V	04NP3	German for Advanced Students P3	Z	1	0+2	Z	V
15CH1 General Chemistry 1 Ond ej Holas, Petr Distler, Václav uba Petr Distler Petr Distler (Gar.) Z 3 2+1 Z V	01NME2	Numerical Methods 2	KZ	2	2+0	L	V
Ond ej Holas, Petr Distler, Václav uba <b>Petr Distler</b> Petr Distler (Gar.)		General Chemistry 1		3	2+1	Z	V
Ond ej Holas, Petr Distler, Václav uba <b>Petr Distler</b> Petr Distler (Gar.)	15CH2	General Chemistry 2	Z,ZK	3	2+1	L	V

02OR	General Relativity Old ich Semerák Boris Tomášik Boris Tomášik (Gar.)	ZK	3	3+0	L	V
01POPJ1	Computers and Natural Language 1	Z	2	0+2	Z	V
01POPJ2	Computers and Natural Language 2	Z	2	0+2	L	V
12POAL	Computer Algebra Richard Liska Richard Liska (Gar.)	KZ	2	2	Z	v
01POGR1	Computer Graphics 1 Pavel Strachota Pavel Strachota Pavel Strachota (Gar.)	z	2	2	Z	V
01POGR2	Computer Graphics 2 Pavel Strachota Pavel Strachota (Gar.)	Z	2	2	L	V
01SITE1	Computer Networks 1 Miroslav Minárik Miroslav Minárik Miroslav Minárik (Gar.)	Z	2	1+1	Z	V
01SITE2	Computer Networks 2 Miroslav Minárik Miroslav Minárik Miroslav Minárik (Gar.)	Z	2	1+1	L	V
01POPR	Advanced Probability Tomáš Hobza	Z	2	2+0		V
12PEL1	Practical Electronics 1	Z,ZK	2	2+0	L	V
12PEL2	Practical Electronics 2	Z,ZK	2	2+0	Z	V
12PIN1	Practical Informatics for Technics 1 Richard Liska, Milan Kucha ik Milan Kucha ik Milan Kucha ik (Gar.)	Z	2	1+1	L	V
12PIN2	Practical Informatics for Technics 2 Milan Ši or Milan Ši or (Gar.)	Z	2	1+1	Z	V
12PIN3	Practical Informatics for Technics 3 Milan Ši or Milan Ši or (Gar.)	Z	2	1+1	L	V
15INPR	Laboratory Practice in Instrumental Methods	KZ	4	0+4	L	V
01PRA1	Probability and Mathematical Statistics 1	Z,ZK	6	4+2	Z	V
01PRA2	Probability and Mathematical Statistics 2	ZK	2	2+0	L	V
01PRST	Probability and Statistics Tomáš Hobza Tomáš Hobza (Gar.)	Z,ZK	4	3+1	Z	V
01PRSTB	Probability and Statistics B Tomáš Hobza Tomáš Hobza (Gar.)	КZ	4	3+1	Z	V
16UAZB	Principles of Ionizing-Radiation Applications Ladislav Musílek Kamil Augsten Ladislav Musílek (Gar.)	ZK	2	2+0	Z	V
16FNZB	Problems of Non-ionizing Radiation	ZK	2	2+0	Z	V
12PSEM	Problem Seminary	Z	2	0+4	L	V
01PROP	Programmer's Practicum Jakub Klinkovský Jakub Klinkovský (Gar.)	Z	2	0+2	Z	V
01PERI	Programming of Peripherals Devices Zden k ulík Zden k ulík (Gar.)	Z	2	2+0	Z	V
01PW	Windows Programming Zden k ulik Zden k ulik Zden k ulik (Gar.)	Z	2	2+0	Z	V
18PRC1	Programming in C++ 1 Vladimír Jarý, Miroslav Virius Miroslav Virius (Gar.)	Z	4	2+2	Z	V
18PRC2	Programming in C++ 2 Vladimír Jarý, Miroslav Virius, Jakub Klinkovský Miroslav Virius Miroslav Virius (Gar.)	KZ	4	2+2	L	V
18PJ	Programming in Java Miroslav Virius Miroslav Virius (Gar.)	Z,ZK	5	2P+2C	Z	V
18MTL	Programming in MATLAB	Z,ZK	5	2+2	Z	V
18MPT	Programming in MATLAB	KZ	5	0+4	Z	V
18PAS	Pascal Programming Miroslav Virius	Z	4	2+2	L	V
12PDR1	Data Communication and Interfaces 1	Z	2	2+0	Z	V
12PDR2	Data Communication and Interfaces 2 Josef Blažej	Z	2	2+0	L	V
01PSL	LaTeX - Publication Instrument Petr Ambrož Petr Ambrož (Gar.)	Z	2	0+2	L	V
00RET	Rhetoric Jana Ková ová Jana Ková ová	Z	1	0+2		V
01RMF	The Equations of Mathematical Physics Václav Klika Václav Klika Václav Klika (Gar.)	Z,ZK	6	4+2	Z	V
02RQGP1	Seminar on Quark-Gluon Plasma 1 Jaroslav Biel ík	Z	1	2+0		V
02RQGP2	Seminar on Quark-Gluon Plasma 2 Jaroslav Biel ík	Z	1	2+0		V
04RM1	Russian for Intermediate Students M1 Michal Beneš	Z	1	0+2	Z	V
04RM2	Russian for Intermediate Students M2 Miloslava echová	Z	1	0+2	L	V

			1	r	1	
04RM3	Russian for Intermediate Students M3 Zhanna Isaeva (Gar.)	Z	1	0+2	Z	V
04RP1	Russian for Advanced Students P1 Michal Beneš	Z	1	0+2	z	v
04RP2	Russian for Advanced Students P2 Miloslava echová	Z	1	0+2	L	V
04RP3	Russian for Advanced Students P3 Zhanna Isaeva (Gar.)	Z	1	0+2	Z	V
04RZ1	Russian for Beginners Z1 Miloslava echová	Z	1	0+4	L	V
04RZ2	Russian for Beginners Z2 Michal Beneš	Z	1	0+4	Z	V
04RZ3	Russian for Beginners Z3 Miloslava echová	Z	1	0+4	L	V
04RZ4	Russian for Beginners Z4 Zhanna Isaeva (Gar.)	Z	1	0+4	Z	V
04RZ5	Russian for Beginners Z5 Zhanna Isaeva Zhanna Isaeva (Gar.)	Z	1	0+4	L	V
01RSWP	Project Management of Software Projects	KZ	2	0+2	Z	v
02SMF	Seminar of Mathematical Physics	Z	2	0+2	z	v
	Martin Štefa ák Ladislav Hlavaťý (Gar.)		_		_	v
01SSM1	Seminar of Contemporary Mathematics 1 Mat j Tušek Edita Pelantová (Gar.)	Z	2	0+2	Z	V
01SSM2	Seminar of Contemporary Mathematics 2 Václav Klika	Z	2	0+2	L	v
16SED1	Dosimetry Seminar 1 Kate ina Pila ová Kate ina Pila ová (Gar.)	Z	2	0+2		V
16SED2	Dosimetry Seminar 2 Kate ina Pila ová	Z	2	0+2		v
01SMB1	Seminar on Calculus B1 Milan Krbálek	Z	2	0+2	Z	v
01SMB2	Seminar on Calculus B2 Milan Krbálek	Z	2	0+2	L	V
01SOS1	Software Seminar 1 Zden k ulík Zden k ulík (Gar.)	Z	2	0+2	Z	V
01SOS2	Software Seminar 2 Zden k ulík Zden k ulík Zden k ulík (Gar.)	Z	2	0+2	L	V
02SPRA1	Special Practicum 1 Lukáš Novotný, Jan epila Jan epila Jan epila (Gar.)	KZ	6	0+4	Z	V
02SPRA2	Special Practicum 2	KZ	6	0+4	L	V
01STR	Jan epila <b>Jan epila</b> Jan epila (Gar.) Statistical Decision Theory Václav K s Václav K s Václav K s (Gar.)	ZK	2	2+0	L	V
11SFBM	Structure and Function of Biomolecules	Z,ZK	3	2+1	Z	V
04SM1	Petr Kolenko, Tomáš Kova Petr Kolenko Petr Kolenko (Gar.) Spanish for Intermediate Students M1	Z	1	0+2	Z	v
04SM2	Spanish for Intermediate Students M3	Z		-		
	Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)		1	0+2	L	V
04SM3	Spanish for Intermediate Students M3 Beatriz Vadillo Gonzalo (Gar.)	Z	1	0+2	Z	V
04SP1	Spanish for Advanced Students P1	Z	1	0+2	Z	V
04SP2	Spanish for Advanced Students P2	Z	1	0+2	L	V
04SP3	Spanish for Advanced Students P3 Beatriz Vadillo Gonzalo (Gar.)	Z	1	0+2	Z	V
04SZ1	Spanish for Beginners Z1	Z	1	0+4	L	V
04SZ2	Spanish for Beginners Students Z2	Z	1	0+4	Z	V
04SZ3	Spanish for Beginners Z3 Beatriz Vadillo Gonzalo (Gar.)	Z	1	0+4	L	v
04SZ4	Spanish for Beginners Z3 Beatriz Vadillo Gonzalo (Gar.)	Z	1	0+4	Z	V
04SZ5	Spanish for Beginners Z5 Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)	Z	1	0+4	L	V
14TM	Engineering Mechanics Ji í Kunz, Aleš Materna <b>Ji í Kunz</b> Ji í Kunz (Gar.)	Z,ZK	4	2+2	3	V
14TEM	Engineering Mechanics	Z,ZK	6	4	5	V
12TAIS	Ji í Kunz Ji í Kunz Ji í Kunz (Gar.) Ion Beam Techniques and Applications.	ZK	3	3+0	L	v
TV-1	Physical Education	Z	1	0.0	Z	v
TV-2	Physical Education	Z	1		L	v
TV-3	Physical Education Physical education	Z	1	0+2	Z	v
TV-4	Physical education	Z	1	0+2		· ·

02TEF1	Theoretical Physics 1 Petr Novotný Petr Novotný Igor Jex (Gar.)	Z,ZK	4	2+2	Z	V
02TEF2	Theoretical Physics 2	Z,ZK	4	2+2	L	V
01DYSY	Filip       Petrásek, Petr       Novotný       Josef       Schmidt       Petr       Novotný (Gar.)         Theory of Dynamic Systems       Branislav       Rehák       Branislav       Rehák       Gar.)	ZK	3	3+0	L	V
01TKO	Diamsia         Reinak         Diamsia         Reinak         Gail.)           Theory of Codes         Edita         Pelantová, Jan Volec         Gar.)	ZK	2	2P+0C	L	V
02TER	Heat and Molecular Physics Filip Petrásek Petr Novotný Petr Jizba (Gar.)	Z,ZK	4	2+2	L	V
02TSFA	Thermodynamics and Statistical Physics Igor Jex, Jaroslav Novotný Antonín Hoskovec Igor Jex (Gar.)	Z,ZK	4	2+2	L	V
01TOP	Topology estmír Burdík estmír Burdík estmír Burdík (Gar.)	ZK	2	2+0	Z	V
16MCRB	Transport of Ionizing Radiation and Monte Carlo Method	Z,ZK	4	2+2	L	V
18INTA	Development of internet applications Jakub Klinkovský, Dana Majerová Dana Majerová (Gar.)	KZ	4	2P+2C	L	V
01DYK	Introduction to Continuum Dynamics Pavel Strachota	Z	2	0+2		V
16ZIVB	Introduction to Ecology Hana Pr šová Hana Pr šová Hana Pr šová (Gar.)	KZ	2	2+0	Z	V
02UFEC	Introduction to Elementary Particle Physics	Z	2	2+0	Z	v
11UFPLN	Jaroslav Biel ík, Marek Matas Jároslav Biel ík Jaroslav Biel ík (Gar.) Introduction to Solid State Physics	ZK	2	2+0		
-	Ivo Kraus, Petr Kolenko Petr Kolenko Ivo Kraus (Gar.)		_		L	V
17UINZ	Introduction to Engineering	Z,ZK	3	2+1	Z	V
02UKP	Introduction to Curves and Surfaces Jan epila	Z	2	1+1	L	V
12ULT	Introduction to Laser Technique	Z,ZK	3	2+1	Z	V
12UMF	Introduction to Modern Physics Jan Pšikal Jan Pšikal Jan Pšikal (Gar.)	Z	3	2+1	L	v
18UOA	Introduction into Object Oriented Architecture Rudolf Pecinovský Rudolf Pecinovský	Z,ZK	4	2P+2C	Z	V
00UPRA	Introduction to Law Martin ech Jana Ková ová	Z	1	0+2		V
00UPSY	Introduction to Psychology Jakub Hají ek Jana Ková ová	Z	1	0+2		V
01UTIZ	Introduction to Theoretical Informatics Petr Ambrož	ZK	2	2+0		V
11UVOD	Introduction to Specialization	Z	2	0+2	Z	V
12VAK	Vacuum Physics and Technology Richard Švejkar Richard Švejkar (Gar.)	KZ	4	2+2	Z	V
12PYTH	Scientific Programming in Python Pavel Váchal, Jakub Urban Pavel Váchal Pavel Váchal (Gar.)	Z	2	0+2	L	V
12VTV	Scientific and Technical Computing Ivan Procházka Ivan Procházka (Gar.)	Z	2	1+1	L	V
12VFT	High Frequency and Impulse Circuitry Jaroslav Pavel Jaroslav Pavel Jaroslav Pavel (Gar.)	Z,ZK	2	2+0	L	V
17VYR	Research Reactors	ZK	2	2	L	V
12EPR1	Basic Electronics Practicum 1 Ivan Procházka, Jaroslav Pavel Ivan Procházka Ivan Procházka (Gar.)	KZ	3	0+2	Z	V
12EPR2	Basic Electronics Practicum 2 Ivan Procházka, Jaroslav Pavel Ivan Procházka Ivan Procházka (Gar.)	KZ	3	0+2	L	V
12ZPLT	Basic Laser Technique Laboratory Václav Kube ek, Josef Blažej Josef Blažej Václav Kube ek (Gar.)	KZ	6	0+4	L	V
12ZPOP	Basic Optical Laboratory Alexandr Jan árek Alexandr Jan árek Alexandr Jan árek (Gar.)	KZ	6	0+4	L	V
18ZALG	Basics of Algorithmization Vladimír Jarý, Miroslav Virius, Petr Pauš, František Vold ich, Zuzana Pet í ková, František Gašpar Vladimír Jarý Miroslav Virius (Gar.)	Z,ZK	4	2+2	L	V
16AMMB	Fundamentals of Analytical Measurement Methods Hana Pr šová Hana Pr šová Hana Pr šová (Gar.)	ZK	2	2+0	L	V
16ZBAF1	Fundamentals of Human Biology, Anatomy and Physiology           1           Alena Doubková, Šimon Vaculín, Zde ka Polívková, Josef Stingl Alena           Doubková Alena Doubková (Gar.)	Z,ZK	4	2+2	z	V
16ZBAF2	Fundamentals of Human Biology, Anatomy and Physiology 2 Alena Doubková, Šimon Vaculín, Josef Stingl Alena Doubková Alena Doubková (Gar.)	Z,ZK	4	2+2	L	V
16ZDOZ2	Fundamentals of Radiation Dosimetry 2 Tomáš Trojek Tomáš Trojek Tomáš Trojek (Gar.)	ZK	2	2+0	L	V
16ZDOZ1	Fundamentals of Radiation Dosimetry 1 Tomáš Trojek Tomáš Trojek Tomáš Trojek (Gar.)	Z,ZK	4	2+2		v

17ZEH	Desire of Frequencie Assessment	ZK	2	2+0	Z	v
17ZEL	Basics of Economic Assessment Basics of Electronics	KZ	3	2+0	Z	v
	Martin Kropík Martin Kropík (Gar.) Basic Electronics 1			-		-
12ZEL1	Jaroslav Pavel Jaroslav Pavel Jaroslav Pavel (Gar.)	Z,ZK	3	2+1	Z	V
12ZEL2	Basic Electronics 2 Jaroslav Pavel Jaroslav Pavel Jaroslav Pavel (Gar.)	Z,ZK	3	2+1	L	V
02ZFM1	Foundations of Physical Measurements 1 Jan epila	Z	2	2+0	Z	v
02ZFM2	Foundations of Physical Measurements 2	Z	2	0+2	L	V
11ZFPL	Basic to Solid State Physics Ladislav Kalvoda, Eva Mihóková Eva Mihóková Ladislav Kalvoda (Gar.)	KZ	2	26P+0C	Z	v
12ZFP	Principles of Plasma Physics Martin Jirka, Ji í Limpouch Martin Jirka Ji í Limpouch (Gar.)	Z,ZK	4	3+1	L	v
02ZJF	Nuclear Physics Vladimír Wagner Martin Štefa ák Vladimír Wagner (Gar.)	Z,ZK	6	3+2	Z	v
02ZJFB	Nuclear Physics B Vladimír Wagner Martin Štefa ák Vladimír Wagner (Gar.)	KZ	3	3+0	Z	v
15ZKJE	Nuclear Power Plants Design and Operation Tomáš Bilý, Lenka Frýbortová, ubomír Sklenka Lenka Frýbortová Tomáš Bílý (Gar.)	ZK	3	2+0	L	v
16MEZB	Fundamentals of Ionizing-Radiation Metrology	Z,ZK	4	2+1	Z	v
01ZOS	Introduction to Operating Systems Zden k ulík Zden k ulík Zden k ulík (Gar.)	Z	2	2+0	L	v
12ZAOP	Fundamentals of Optics Ivan Richter, Pavel Kwiecien Ivan Richter Ivan Richter (Gar.)	Z,ZK	2	2+0	Z	v
01ZPB1	Introduction to Computer Security 1 Petr Voká Petr Voká Petr Voká (Gar.)	Z	2	1+1		v
16ZPSP	Basic Work with PC Kamil Augsten Kamil Augsten (Gar.)	Z	2	0+2	1	v
18ZPRO	Basics of Programming Maksym Dreval, Vladimír Jarý, Miroslav Virius, Jakub Klinkovský, Petr Pauš, František Vold ich, Jan Tomsa, Zuzana Pet í ková Miroslav Virius Miroslav Virius (Gar.)	Z	4	4C	z	v
16ZRAO	Basics of Radiation Protection Aneta Dušková Aneta Dušková (Gar.)	Z	2	2+0		v
02ZSM	Introduction to the Standard Model Zden k Hubá ek Zden k Hubá ek Zden k Hubá ek (Gar.)	ZK	2	2+0		v
16ZEDB	Basics of Experimantal Data Processing Kate ina Pila ová Kate ina Pila ová Kate ina Pila ová (Gar.)	ZK	2	2+0	Z	v
14ZZKS	Testing and Processing of Metals and Alloys	KZ	4	4	6	V
12ZDP	Data Processing for Publishing Antonín Novotný Antonín Novotný (Gar.)	Z	2	2	Z	V
12ZMD	Measurement and Data Processing	KZ	2	1+1	Z	v
02DEF1     Hi       Physics and its place in the       Helenistic period, Archimed       as experimental science. N       02TER     Hi       Thermal expansion of mate       entropy; non-chemical system       18ZPRO     Ba	e courses of this group of Study Plan: Code=BSVOLPREDM Na istory of Physics 1 system of sciences. The relationship of man and nature. Natural sciences in ancient Or I. Arabic science, European science in Middle Ages. Renaissance - da Vinci, Giordano E ewton and his work. eat and Molecular Physics rials, heat transfer; stationary and non-stationary heat conduction, heat transfer and per ems: dielectric and magnetic materials; Maxwell relations and thermodynamic potentials; asics of Programming inly for students with little or no experience in programming. It familiarizes the students of	ientand Greece, Bruno. Copernicu netration; 1st anc ; kinetic theory: M	Greek natu s, Kepler, G I 2nd therm Iaxwell's ve	ral philosoph Galileo, Huyg Zodynamic pr locity distribu	ens. The birth Z,ZK inciple, ideal a ition,equiparti Z	of physics 4 and real gas tion theorem 4
programming language.						
The course is an introductic to description of dynamics problem, the motion of a sy	neoretical Physics 1 on to analytical mechanics. The students acquire knowledge of the basic concepts of the l (Newton's, Lagrange, Hamilton and Hamilton-Jacobi equations). The efficiency of these stem of constrained mass points, and of a rigid body. Advanced parts of the course cover of classical theoretical physics (02TEF1, 02TEF2).	methods is illustr	ated on ele	ormalism as v ementary exa	mples like the	two-body
02TEF2	neoretical Physics 2 is in physics. Mechanics of point mass, rigid body and continuum. The special theory of ssical electrodynamics: Maxwell's equations in the Minkowski space-time, electromagne	-		ics and class , electromagi	netic radiation	-
	nermodynamics and Statistical Physics nics and statistical physics. Thermodynamic potential, the Joule Thomson effect,conditior	of equilibrium	the Braun I	1	Z,ZK	4 stical entropy
Basics of many body descr	nics and statistical physics. I nermodynamic potential, the Joule Thomson effect, condition iptionfrom a statistical point of view (classical and quasiclassical regime within the frame idy radiation). The Boltzmann equation is usedto discusses simple transport phenomena	e of a canonical a		-	-	
01NME2 N	umerical Methods 2 merical solution of boundary-value problems and intial-boundary-value problems for ordir		ifferential e		KZ	2 ds converting
	p initial-value problems and finite-difference methods for elliptic, parabolic and first-order			-		

01RMF	The Equations of Mathematical Physics	Z,ZK	6
The subject of this cours	se is solving integral equations, theory of generalized functions, classification of partial differential equations, theory of integra		
partial differential equati	ons (boundary value problem for eliptic PDE, mixed boundary problem for eliptic PDE).		
14TEM	Engineering Mechanics	Z,ZK	6
	presents a link-up between the theoretical mechanics of rigid bodies and engineering disciplines dealing with stress and strai	in analysis of real	structure parts
	ture mechanics, etc.). Principles of statics, kinematics, and dynamics and their application.		
14ZZKS	Testing and Processing of Metals and Alloys	KZ	4
	hardness, impact toughness, technological testing, fatigue testing, creep testing. Light microscopy, preparation of specimens i g, soldering, brazing, powder metallurgy, mechanical machining. Copper alloys, aluminium alloys, titanium alloys, special alloy		
drawing and CAD.	g, soldening, srazing, powder metallorgy, meenallicar maenining. Copper alloys, aldrinnen alloys, aldrinnen alloys, special alloy		
00EKOT	Economy in Technology	Z	1
The course introduces the	he basics of micro- and macroeconomics.		
00RET	Rhetoric	Z	1
The course is focused o	n the acquisition of speech and voice techniques and on the rules of correct pronounciation. The course is also devoted to the	e composition of	public speech
	al aspects. Stylistics exercises, strategies for coping with stage-fright and a short excursion into the history of rhetoric are an		
00UPRA	Introduction to Law	Z	1
00UPSY	Introduction to Psychology	Z	1
12AUX	Administration of UNIX System	KZ	2
	ed administration of Unix operating system		-
01ALG	Algebra	ZK	4
commutative fields.	o the set theory standard algebraic structures are dealt with: groups, rings, fields, modules, linear algebras, lattices, Boolean a	ligebras, rings of p	olynomials over
	Algebra	Z,ZK	6
	s are treated in detail. Elements of the set theory cover only: equivalence and subvalence, the Cantorov-Bernstein theorem, the		-
	ordinals and cardinals. Further standard algebraic structures are addressed: semigroups, monoids, groups, rings, integral do		
	lent chapters are devoted to divisibility in integral domains and to finite fields.		
11ANEL	Linear Circuit Analysis	Z,ZK	4
The course is the introd	uction to the linear electronics for physicists. In the first part it describes basic methods of linear circuit analysis. It is especial	ly oriented to the	understanding
of the computer method	s of analysis. The second part gives a short list of most commonly used circuits in experimental equipment.		
	Analytical Calculations and Chemometry Principals	ZK	2
	principles of chemometry including errors in classical and instrumental analysis, probability theory, propagation of errors, ba		
-	esting, hypothesis testing, least squares regression and correlation, calibration and fitting methods, non-parametric testing, s metry of redox, acid-base, complex and precipitation reactions, gravimetric stoichiometry. pH calculations, calculations in pot	-	-
-	separation methods, solving of complex forming equilibria.	lentiometry, could	ineu y,
04ABZK	English - State Examination	ZK	5
	e examination as given by the study plan. Student is eligible for the State language examination (level C1 or B2 of CEFR) on		-
respective courses and	examinations (04AP3KK, 04APAK, 04API, and 04APRK). From its first semester, part of the APIN programme covers also ex	amination subject	ts. As required,
examination conditions	comply with respective rules and regulations for state language examinations.		
04AM1	English for Intermediate Students M1	Z	1
-	for students who have successfully completed the full secondary school English language course at least at the A2 level of th	-	
-	iges (CEFR). It provides an introduction into English for Specific and Academic Purposes (ESP, EAP), i.e., into fundamentals itten communication situations. Thus it covers topics related to the student's life and needs as well as topics of subtechnical	-	
	e of grammar issues used in EAP.	Interest. Attention	is also paid to
04AM2	English for Intermediate Students M2	Z	1
-	ects the student to have completed the 04AM1 course. It develops their skills for work with subtechnical texts, focusing also mo		-
	of ESP and EAP (e.g., definition, existence and classification of phenomena, object descriptions). Part of the course is also guid		
revision is included.			
04AM3	English for Intermediate Students M3	Z	1
	skills that enable students to cope with features typical of professional style. Increasing attention is paid to developing subtech		·
	sional texts. Great emphasis is placed on distinguishing different levels of formal and informal oral and written communication also includes studying abstracts and rules for writing them as well as basic rules for preparing and giving a short presentatio		
student's field.	also includes studying abstracts and rules for writing them as well as basic rules for preparing and giving a short presentatio	in on a chosen top	
04AP1	English for Advanced Students P1	Z	1
	for students who have successfully completed the full secondary school English language course (at least the B1 level of the		ean Framework
of Reference for Langua	ages - CEFR). It provides an introduction into English for Specific and Academic Purposes (ESP, EAP), i.e., into the fundame	ntals of vocabular	y, functions,
• • • •	cal of professional oral and written communication situations (fundamentals of terms in mathematics and physics, definitions,	• • •	. ,
	and written communication on topics related to the undergraduate's life and needs. It develops skills for free professional writing	(writing a CV, lett	er of application,
	sary, revision of selected grammar topics is included.	7	4
	English for Advanced Students P2 sed on 04AP1, thus extending the student's skills for working with subtechnical texts, and even with professional texts of chose	Z	1
	t concentrates on chosen grammar topics, but mainly intends to develop understanding of syntactic structures and typical rhe		-
	nd, if possible, a case study). Increasing emphasis is placed on the undergraduate's independent work with and reading of lir		-
materials. The course ex	tends the student's subtechnical vocabulary, and includes fundamental notions of chosen branches of science. It is focused	on formal writing	including the
	n structure, linking, cohesion and coherence in texts.		
04AP3	English for Advanced Students P3	Z	1
	sed on 04AP2 and expects the student to work without any guidance with authentic professional materials and to interpret the		-
	skills and functions (e.g., expressing an opinion, agreement, and objections; taking part in discussion, note-taking; summarizi a project on a given or chosen topic and presenting it. The course places emphasis on distinguishing levels of formal and inl		-
written communication.	מ איז	anguage L	
16APLB	Application of Ionizing Radiation in Analytical Methods	ZK	5
	of ionizing radiation in analytical methods is devoted to radioanalytical methods and the use of radionuclides and ionizing radia		
of technological process	ses.		

12APL A	Application of Lasers	Z,ZK	2
Application of lasers in inc	dustrial technologies, medicine, remote sensing, energetics, telecommunication, military, entertainment and other branches		
11APLG A	Applications of Group Theory in Solid State Physics	ZK	2
	ystem symmetry allows, without any quantitative calculations, rigorously and precisely determine how many energy states		
	nem may occur. Therefore, the main purpose of this course is to describe the methods by which we can extract the informat	-	
	plication of these methods is illustrated by an example of molecular orbitals, inner orbitals of ions in the crystal field environi ules for optical absorption transitions.	ment, normal mo	des of molecular
,	Atomic and Molecular Spectroscopy	Z,ZK	4
	atomic and molecular spectroscopy.	2,213	-
04CESM1 0	Czech for foreigners - Intermediate	Z	1
The course is focused on a	correct pronunciation, important morphological phenomena, prepositional phrases, and verb forms as well as on extending th	e student´s vocat	oulary for various
social situations.			
	ntermediate Czech 2	Z	1
	topics covered in CESM1 and is then focused on more difficult grammar phenomena. It practices writing, speaking, and real approximation works and formulae	ading skills and tra	ains the student
	abbreviations, abbreviated words, and mathematical terms and formulas.  ntermediate Czech 3	Z	1
	orphological topics covered earlier and extends the student's knowledge of more difficult language phenomena. It is espec	_	-
	ing the student's writing skills.		lynolloo ana
	Czech for Foreign Students - Advanced Examination	Z	1
	urse is very good knowledge of the Czech language, i.e., communicative competences at least at level B2 of the Common Eu	uropean Framewo	ork of Reference.
It is focused partly on revi	sion of standard language structures, but mainly on practising more complex grammatical structures typical of the style of s	science. Students	are taught the
-	of engineering and professional communication, both in spoken and written form. The topics include University Studies and	Student Life. Write	tten practice
	vith teachers and faculty administrators.	7	4
	Czech for Foreigners - Advanced tudent´s knowledge acquired in CESP1 and focuses on difficult language phenomena. It practises working with technical a	Z nd appoint toyte	1 placing groater
emphasis on individual wo		nu specialist lexis	s placing greater
	Czech for Foreigners - Advanced	7	1
	student's knowledge from CESP2. It includes working with authentic specialist materials, their interpretation and presentation	-	esentation of the
-	skills necessary for professional communication are trained.		
15DALCH	History of Alchemy and Chemistry	ZK	2
	overview of crafts with chemical and/or metallurgical basis. Development of alchemy from ancient times in China, India, and	d Hellenistic world	l is discussed.
· ·	dedicated to Alchemy in Arabic world and various aspects of alchemy in Latin Europe. The influence of alchemical approac	hes development	onto crafts
advancement is illustrated			
	History of Physics 2	Z	2
	mechanics after Newton, Bernoulli's, Euler, Lagrange. Historical development of optics, corpuscular and wave approach. El electrodynamics and electromagnetism, Faraday and Maxwell. Thermodynamics and its laws, statistical physics, Boltzman		
	anck and Einstein. Discovery of radioaktivity, structure of atom, atomic nucleus, Rutherford and Bohr. The way to nuclear er		
standard model. The conc	ept of Nature and Universe of today.		-
01DEM	History of Mathematics	Z	1
	of regular seminars where the members of the department of mathematics, but also invited speakers - specialists in the field	- give their talks of	on varoius topics
from the history of mather			
	Differential Equations, Symmetries and Groups	Z	4
	e is to teach students computation of symmetries of the differential equations.	Z	2
	Discrete Mathematics 1 elementary number theory and applications. It includes individual problem solving.	2	2
	Discrete Mathematics 2	7	2
	Discrete Mathematics 2	Z	2
01DIM3 [		Z	2
	recurrence relations. It includes individual problem solving.	Z	2
The subject is devoted to solution chosen from the	recurrence relations. It includes individual problem solving. Discrete Mathematics 3 elementary proofs of non-trivial combinatoriwal identities and to generating functions and their applications. In the seminar given literature.	Z students present	2 a problem with
The subject is devoted to solution chosen from the solution chosen from	recurrence relations. It includes individual problem solving. Discrete Mathematics 3 elementary proofs of non-trivial combinatoriwal identities and to generating functions and their applications. In the seminar given literature. Instrumentation and Measurement	Z	2
The subject is devoted to solution chosen from the solution chosen from	recurrence relations. It includes individual problem solving. Discrete Mathematics 3 elementary proofs of non-trivial combinatoriwal identities and to generating functions and their applications. In the seminar given literature. nstrumentation and Measurement etion to the instrumentation and measurement for physicists.	Z students present Z,ZK	2 a problem with 2
The subject is devoted to solution chosen from the generation of the solution chosen from the generation of the course is the introduct of the course is the introduct of the solution of the s	recurrence relations. It includes individual problem solving. Discrete Mathematics 3 elementary proofs of non-trivial combinatoriwal identities and to generating functions and their applications. In the seminar given literature. Instrumentation and Measurement etion to the instrumentation and measurement for physicists. Electron Microscopy	Z students present Z,ZK Z,ZK	2 a problem with 2 3
The subject is devoted to solution chosen from the g 11ELEA I The course is the introduce 14ELMI E In this course the students	recurrence relations. It includes individual problem solving. Discrete Mathematics 3 elementary proofs of non-trivial combinatoriwal identities and to generating functions and their applications. In the seminar given literature. Instrumentation and Measurement etion to the instrumentation and measurement for physicists. Electron Microscopy s are introduced to the microscopic methods used for the characterization of materials, thin layers or nanoparticles. The intr	Z students present Z,ZK Z,ZK roductory part is o	2 a problem with 2 3 dedicated to the
The subject is devoted to solution chosen from the gamma from the gamma from the gamma from the introduct of the course is the introduct of the course is the introduct of the gamma from	recurrence relations. It includes individual problem solving.  Discrete Mathematics 3 elementary proofs of non-trivial combinatoriwal identities and to generating functions and their applications. In the seminar given literature.  Instrumentation and Measurement etion to the instrumentation and measurement for physicists.  Electron Microscopy s are introduced to the microscopic methods used for the characterization of materials, thin layers or nanoparticles. The intr on microscopy and to various types of microscopes. An important part of the course is given to the interaction of different ty	Z students present Z,ZK Z,ZK roductory part is o ypes of radiation	2 a problem with 2 3 dedicated to the with matter,
The subject is devoted to solution chosen from the gamma solution chosen from the gamma solution chosen from the gamma solution from the solution of the soluti	recurrence relations. It includes individual problem solving. Discrete Mathematics 3 elementary proofs of non-trivial combinatoriwal identities and to generating functions and their applications. In the seminar given literature. Instrumentation and Measurement etion to the instrumentation and measurement for physicists. Electron Microscopy s are introduced to the microscopic methods used for the characterization of materials, thin layers or nanoparticles. The intr	Z students present Z,ZK Z,ZK roductory part is o ypes of radiation ynamic theory of	2 a problem with 2 3 dedicated to the with matter, diffraction, types
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The subject is devoted to solution chosen from the gamma solution for the students analogy of light and electric mathematical formulations of contrast, and diffraction for the students and the gamma solution of contrast, and diffraction for the students and the solution of contrast, and diffraction for the students analogy of light and electric mathematical formulations of contrast, and diffraction for the students and the solution of contrast, and diffraction for the solution of contrast, and diffraction	recurrence relations. It includes individual problem solving. Discrete Mathematics 3 elementary proofs of non-trivial combinatoriwal identities and to generating functions and their applications. In the seminar given literature. Instrumentation and Measurement tition to the instrumentation and measurement for physicists. Electron Microscopy s are introduced to the microscopic methods used for the characterization of materials, thin layers or nanoparticles. The intr on microscopy and to various types of microscopes. An important part of the course is given to the interaction of different ty a and tools used in microscopy and to the description of particular parts of the microscopes. Introduction to kinematic and de a and imaging techniques are also covered. A particular attention is given to analytical methods and imaging techniques in a English Graduate Standard 1 in English Presentation, English Discussions, creation of the technical text, structures of important documents, Pro European Computer Driving Licence 1 ire an important tool, especially for students and graduates in Software engineering in economics. Summer semester intro put on advanced functions of MS Excel (names, functions and expressions, pivot table and graph). Next, the VBA language addressed. European Computer Driving Licence 2 re an important tool, especially for students and graduates in Software engineering in economics. Summer semester follows t (charts, objects, graphical user interface, add-ins programming) and introduces some applications in economics, mathemat Exact Methods in Research of Historic Monuments	Z students present Z,ZK Z,ZK roductory part is of ynamic theory of atomic resolution. KZ poceedings to be p Z duces the studen e will be introduce the winter semested tics, operational r	2 a problem with 2 3 dedicated to the with matter, diffraction, types 4 ublished 2 ts also into other ed and macros 2 er with advanced esearch, and 2
The subject is devoted to solution chosen from the en- analogy of light and electric mathematical formulations of contrast, and diffraction 12EGS1 E- Improving the knowledge 18ESPG1 E- Spreadsheet calculators and office tools. The accent is and user functions will be 18ESPG2 E- Spreadsheet calculators and office tools. The accent is and user functions will be 18ESPG2 E- Spreadsheet calculators and vBA programming topics computer science. 16EPAM E- Aims and methods of histor	recurrence relations. It includes individual problem solving. Discrete Mathematics 3 elementary proofs of non-trivial combinatoriwal identities and to generating functions and their applications. In the seminar given literature. Instrumentation and Measurement tion to the instrumentation and measurement for physicists. Electron Microscopy s are introduced to the microscopic methods used for the characterization of materials, thin layers or nanoparticles. The init on microscopy and to various types of microscopes. An important part of the course is given to the interaction of different ty and imaging techniques are also covered. A particular parts of the microscopes. Introduction to kinematic and du and imaging techniques are also covered. A particular attention is given to analytical methods and imaging techniques in a English Graduate Standard 1 in English Presentation, English Discussions, creation of the technical text, structures of important documents, Pro European Computer Driving Licence 1 re an important tool, especially for students and graduates in Software engineering in economics. The winter semester intro put on advanced functions of MS Excel (names, functions and expressions, pivot table and graph). Next, the VBA language addressed. European Computer Driving Licence 2 re an important tool, especially for students and graduates in Software engineering in economics. Summer semester follows t (charts, objects, graphical user interface, add-ins programming) and introduces some applications in economics, mathemat Exact Methods in Research of Historic Monuments rice monument investigations, methods of age determination (radiocarbon, thermoluminescence and related methods, further rad	Z students present Z,ZK Z,ZK roductory part is of ynamic theory of atomic resolution. KZ occeedings to be p Z duces the studen e will be introduce the winter semested tics, operational r	2 a problem with 2 3 dedicated to the with matter, diffraction, types 4 ublished 2 ts also into other ed and macros 2 er with advanced esearch, and 2 endrochronology,
The subject is devoted to solution chosen from the en- analogy of light and electric mathematical formulations of contrast, and diffraction 12EGS1 E- Improving the knowledge 18ESPG1 E- Spreadsheet calculators and office tools. The accent is and user functions will be 18ESPG2 E- Spreadsheet calculators and office tools. The accent is and user functions will be 18ESPG2 E- Spreadsheet calculators and vBA programming topics computer science. 16EPAM E- Aims and methods of histor	recurrence relations. It includes individual problem solving. Discrete Mathematics 3 elementary proofs of non-trivial combinatoriwal identities and to generating functions and their applications. In the seminar given literature. Instrumentation and Measurement tition to the instrumentation and measurement for physicists. Electron Microscopy s are introduced to the microscopic methods used for the characterization of materials, thin layers or nanoparticles. The intr on microscopy and to various types of microscopes. An important part of the course is given to the interaction of different ty a and tools used in microscopy and to the description of particular parts of the microscopes. Introduction to kinematic and de a and imaging techniques are also covered. A particular attention is given to analytical methods and imaging techniques in a English Graduate Standard 1 in English Presentation, English Discussions, creation of the technical text, structures of important documents, Pro European Computer Driving Licence 1 ire an important tool, especially for students and graduates in Software engineering in economics. Summer semester intro put on advanced functions of MS Excel (names, functions and expressions, pivot table and graph). Next, the VBA language addressed. European Computer Driving Licence 2 re an important tool, especially for students and graduates in Software engineering in economics. Summer semester follows t (charts, objects, graphical user interface, add-ins programming) and introduces some applications in economics, mathemat Exact Methods in Research of Historic Monuments	Z students present Z,ZK Z,ZK roductory part is of ynamic theory of atomic resolution. KZ occeedings to be p Z duces the studen e will be introduce the winter semested tics, operational r	2 a problem with 2 3 dedicated to the with matter, diffraction, types 4 ublished 2 ts also into other ed and macros 2 er with advanced esearch, and 2 endrochronology,

02EXF1	Experimental Physics 1	Z	2
Lecture represents an	ntroductory course in experimental physics. Students will learn methods of measurement of basic physical quantities and me	thods of measure	ment evaluation.
02EXF2	Experimental Physics 2	ZK	2
	introductory course in experimental physics. Students will learn methods of measurement of basic physical quantities and me		
17ENF The lectures are mainly	Experimental Neutron Physics / focused on detailed characterisation of neutron properties, characteristics of neutron (reactor and non reactor) sources, pro	KZ perties of prompt	2 and delayed
neutrons, neutron dete	ction methods, neutron induced nuclear reactions, modification and adjustment of neutron field, science and industry neutron	applications. Las	t lecture deals
	processing and analysis. The lectures are supplemented with experimental practices in the field of neutron detection, determina		
-	on in various materials, preparation and characterisation of photo-neutron source and neutron source calibration. Experimental	practices will be ru	unning at training
reactor VR-1 and in the		1	
04FM1	French for Intermediate Students M1	Z	1
	M The objective of this three-semester course is to improve and further develop communication in the French language in bo		
	icate in social interaction and in academic, scientific and professional environment. They will be able to use the language to the	•	
	e problems. 04FM1 The course builds on and further develops linguistic competence acquired at secondary school. It revises, s	-	
	s study. The following topics are covered: University studies in our country and in France, writing of transactional letters, CV, pe Ilture and geography, Paris. Topics of specialization: mathematics, physics. Reading technical and popular science texts, work		
04FM2	French for Intermediate Students M2	Z	1
	FM1. Linguistic structures and competence acquired in previous study are systemized and expanded. Reading popular science	texts, features typ	pical for technical
and scientific language	(passives, nominalization, word formation). Topics: physics, power engineering, environment, Internet, success of French sci	ence and technol	ogy, French
scientists, artists and a	rchitects. Description of an object, device, shapes, dimensions, material.		
04FM3	French for Intermediate Students M3	Z	1
The course is focused of	on improvement and further development of linguistic competence acquired during the follow-up courses. Syntactic structures (	subordinate and i	nfinitive clauses,
participle structures, co	propound tenses). Text summaryStudents prepare a written paper which will be delivered in form of an oral presentation in-c	lass. The paper is	linked to the
	specialisation or to their interest and generally covers a technical /applied science topic. It is not a translation but a creative w	-	n French articles
and one's own knowled	dge/experienceLonger monologues on topics /situations set for the examination are prepared. Text structure, cohesion and	coherence.	
04FP1	French for Advanced Students P1	Z	1
	The objective of this three-semester course is to improve and further develop communication in the French language in both		
	icate in social interaction and in academic, scientific and work environment. They will be able to use the language to transmit	-	
	04FP1 The course builds on and further develops linguistic competence acquired at secondary school. Difficult grammar topi		•
	osé-imparfait, pronouns. The following specific topics are covered: University studies in our country and in France, writing of t		-
-	swer to an advert, environmental issues, success of French science and technology, chosen topics from French regional culture sharing a basistic Decilies of technical and a surface science to the further work with these topics from French regional culture to the second science to the	ire, Paris. Topics o	of specialization:
	physics, chemistry. Reading of technical and popular science texts, further work with these texts and interpretation.	7	4
04FP2	French for Advanced Students P2	Z	1
	tents, the course further develops language skills. Focus is put on reading popular science texts and on oral communication of	in given topics. Fe	eatures typical of
	communication are stressed (passive voice, nominalization, word formation).	7	1
04FP3	French for Advanded Students P3 on systemization and improvement of acquired linguistic competence, skills and knowledge, and their use for communication in		
	rter texts (both from and into the language). Writing of a paper and making oral presentation in-class. The paper generally co		-
	rectance (both normalic fine ranguage). Writing of a paper and making oral presentation in-class. The paper generally co rrk compiled from 3 French sources. Preparation of several set topics for oral examination.		applied science
04FZ1	French for Beginners Z1	7	1
	he objective of this 5-level course is to be able to communicate in French orally and in writing in situations of everyday life, in	-	
-	ench for specific / technical communication and reading of popular science and scientific texts. 04FZ1 The objective is to be a	-	-
	knowledge of chosen elementary language. The contents is roughly outlined by lessons 1 - 7 of the textbook Pravda - Pravd		-
	ate ky). It is extended with situations of communication and functions from the textbook Espaces I, lessons 1-4 : introductions		
	mple instructions and questions. Special attention is paid to pronunciation. Spelling is explained in connection with pronuncia	-	-
04FZ2	French for Beginners Z2	Z	1
-	p with 04FZ1. Elementary linguistic knowledge and communication skills are expanded. The scope is given by lessons 8 - 13 (	-	1
	Additional topics and skills are filled in from the textbook Espaces I, lesson 1 - 5 (introductions, invitation, welcoming, agreer		
thanking, travelling, ma	p of France, food, expression of will, wish, order, prohibition, pleasure). Correct pronunciation is practiced. Stress on oral comm	unication. Specifi	c topics covered:
How does the machine	work? A few expressions concerning the study. Name of University and Faculty.		
04FZ3	French for Beginners Z3	Z	1
The course builts upon	04FZ2. Basic linguistic knowledge and skills are developed. The contents is given by lessons 14 - 18 of the textbook: Pravda	- Pravdová: Fren	ch for Beginners.
Topics, functions and s	ituations are complemented from other materials. Stress is put on oral communication in dialogues and on reading, both for in	nformation and lo	ud as part of
pronunciation practice.	Reading covers short adapted texts of general interest first, and later popular science texts.		
04FZ4	French for Beginners Z4	Z	1
The course builds up o	n 04FZ3. Basic linguistic knowledge and skills are further developed. Oral communication and reading skills are practiced. Th	e contents is roug	hly covered with
lessons 19 - 23 of the te	extbook French for Beginners, and is expanded with topics and functions from other materials. Reading is developed from the le	cture notes Frencl	h for Engineering
	course covers generals and specific topics: health- illness, sport, free time, environment, study, travelling in France, Paris, sho	pping, weather, u	niversity in our
-	how to write CV, application, topics in mathematics, reading physics - mechanics, informatics, internet.		
04FZ5	French for Beginners Z5	Z	1
	n FZ4 are further developed, as well as technical language. Students prepare a paper on a chosen popular science topic. The		
•	ered by lessons 24 - 26 of the textbook: Pravda-Pravdova, French for Beginners, and is complemented from other materials.		
	ch science and technology, information about France. Grammar is systemized and complemented with syntax (subordinate cl	auses, typical cor	njunctions,
subjunctive clauses, ge	· · ·	71/	2
01FKP	Functions of Complex Variable	ZK	2
	dvanced properties of systems of holomorphic functions, Ascoli-Vitali's theorem, advanced properties of conformal mappings,		ind meromorphic
	ties of complex functions of several complex variables together with improper line integrals and its applications are presented		-
01FKPB	Functions of Complex Variable B	Z	2
	dvanced properties of systems of holomorphic functions, Ascoli-Vitali's theorem, advanced properties of conformal mappings,		ina meromorphic
	ties of complex functions of several complex variables together with improper line integrals and its applications are presented		A
01FAN1	Functional Analysis 1	Z,ZK	4
Lasic notions and resu	Its are addressed concerning successively topological spaces, metric spaces, topological vector spaces, normed and Banach	i spaces, milbert	spaces.

01FA1	Functional Analysis 1	Z,ZK	3
Continuing course of n	athematical analysis and algebra introduction to the basics of functional analysis. There are the concepts that students need to	o understand the	various physical
and technical discipline			
01FA2	Functional Analysis 2	Z,ZK	4
	sent selected fundamental results from functional analysis including basic theorems of the theory of Banach spaces, closed of	perators and thei	r spectrum,
· · · · ·	ors, spectral decomposition of bounded self-adjoint operators.		
02PRA1	Experimental Laboratory 1	KZ	6
	ecially for students who intend to study some of the physical specializations of FNSPE(branch Physical Engineering, Nuclear		
-	terested in the otherspecializations. In Experimental laboratory students learn how to prepare for experiments (including work with	-	-
	cquire of different experimental procedures and routines), willteach writing the records of measurement, processing and evalu nowledge gained in lectures on physics.	lation of results. A	t the same time
		1/7	0
02PRA2	Experimental Laboratory 2		6 t it can be also
	pecially for students who intend to study some of the physical specializations of FNSPE(branch Physical Engineering, Nuclear terested in the otherspecializations. In Experimental laboratory students learn how to prepare for experiments (including work with		
-	cquire of different experimental procedures and routines), willteach writing the records of measurement, processing and evalu	-	-
	nowledge gained in lectures on physics.		
02FYS1	Physical Seminar 1	Z	2
	I to detailed study of interesting physical problems. It should help students to deeper understanding of fundamentals of physic	- 1	
	ns are chosen, studied and presented by the students themselves, with the possibility to use PC and physical laboratory equi	-	
02FYS2	Physical Seminar 2	Z	2
	I to detailed study of interesting physical problems. It should help students to deeper understanding of fundamentals of physic	s presented in the	
Electricity and Magnet	sm. The problems are chosen studied and presented by the students themselves, with the possibility to use PC and physical la	aboratory equipm	ents.
01GTDR	Geometric Theory of Ordinary Differential Equations	Z	2
The seminar consists of	f the qualitative theory of ODEs dealing with the geometric and topological properties of the solution. In this context, we mention	n suitably formula	ted basic results
of the existence and u	iqueness, continuous dependence on parameters and initial conditions. Main part is devoted to the autonomous systems.		
12INS1	Information Systems 1	Z,ZK	2
Information technology	architecture of the databases, network databases, cloud application Google, Microsoft, information managament, aproaches to	solve task of info	rmation systems
12INS2	Information Systems 2	Z,ZK	2
Graduation of Informat	on systems 1 is required. In more details: Information technology, architecture of the databases, network databases, cloud ap	plication Google,	Microsoft,
information managame	nt, aproaches to solve task of information systems		
16ZJTB	Nuclear Energy Facilities and Accelerators	ZK	2
Basic scheme of nucle	ar reactor and nuclear power plant, chain fission reaction development, main components of nuclear energetic reactor, most ir	nportant reactor t	ypes, linear
high-voltage accelerate	rs, linear high-frequency accelerators, accelerators based on cyclotron, microtron, betatron, electron and proton synchrotrons	s, electron and ior	sources for
accelerators, targets.			
17JARE	Nuclear Reactors	ZK	2
	rer issue. Previous evolution of power reactor. Nuclear fission reactors, fuel assemblies, active core, control systems, safety systems		
-	rations. Standard types of nuclear power reactors: concept, description, layout, previous evolution, world share, perspectives. P		
	estinghouse, KWU, Framatom). VVER-type reactors, Temelín nuclear power plant. Boiling water reactors. Heavy water reactor		
	cooled reactors. Second nuclear era. reactors of generation III (EPR, AP-1000, VVER 1200). Reactors of generation IV: GIF ar		es. Evaluation
	ed systems. Six selected concepts. ICRP scenarios of word evolution, hydrogen power, role of nuclear power in long-term out		
01JEPR	Simple Compilers	Z	2
	lysis, code generation, simple optimizations, development environments, reflection. Clinical Propaedeutic	ZK	
16KPR	· · ·		2
-	ar with the basics of anamnesis, physical examination, examinational methods of different organs, hematological and biochemic		
04AKS	English Conversation	Z	ا مواويدوام الأنبينية
	o the student's communication skills acquired throughout their previous studies. It aims to improve all aspects of oral communi ious communication situations and will master their communication strategy. They will also practise their listening skills in orde	ication. The stude	
-		or to better follow:	and narticinate
02KF			and participate
	dent will be trained to express their ideas clearly and according to current English usage, and become a more confident speak	ker.	
State description wave	dent will be trained to express their ideas clearly and according to current English usage, and become a more confident speak Quantum Physics	ker. Z,ZK	3
-	dent will be trained to express their ideas clearly and according to current English usage, and become a more confident speak Quantum Physics function, postulates of quantum mechanics, Born is statistical interpretation, expectation values, Schrödinger equation, Heise	ker. Z,ZK	3
quantization of angula	dent will be trained to express their ideas clearly and according to current English usage, and become a more confident speak Quantum Physics function, postulates of quantum mechanics, Born s statistical interpretation, expectation values, Schrödinger equation, Heise momentum, solution of simple systems, hydrogen atom.	ker. Z,ZK enberg uncertaint	3 y principle,
quantization of angular	dent will be trained to express their ideas clearly and according to current English usage, and become a more confident speak Quantum Physics function, postulates of quantum mechanics, Born s statistical interpretation, expectation values, Schrödinger equation, Heise momentum, solution of simple systems, hydrogen atom. Experimental Laboratory 1	ker. Z,ZK	3
quantization of angula 02LCF1 Cavendish experiment	dent will be trained to express their ideas clearly and according to current English usage, and become a more confident speak         Quantum Physics         function, postulates of quantum mechanics, Born s statistical interpretation, expectation values, Schrödinger equation, Heise momentum, solution of simple systems, hydrogen atom.         Experimental Laboratory 1         Elasticity. Thermal capacities. Electric measurements, Acoustic. Oscillations.	ker. Z,ZK enberg uncertaint Z	3 y principle, 2
quantization of angular 02LCF1 Cavendish experiment 02LCF2	dent will be trained to express their ideas clearly and according to current English usage, and become a more confident speak         Quantum Physics         function, postulates of quantum mechanics, Born s statistical interpretation, expectation values, Schrödinger equation, Heise momentum, solution of simple systems, hydrogen atom.         Experimental Laboratory 1         Elasticity. Thermal capacities. Electric measurements, Acoustic. Oscillations.         Experimental Laboratory 2	ker. Z,ZK enberg uncertaint	3 y principle,
quantization of angular 02LCF1 Cavendish experiment 02LCF2 Electric and magnetic	dent will be trained to express their ideas clearly and according to current English usage, and become a more confident speak         Quantum Physics         function, postulates of quantum mechanics, Born s statistical interpretation, expectation values, Schrödinger equation, Heise momentum, solution of simple systems, hydrogen atom.         Experimental Laboratory 1         Elasticity. Thermal capacities. Electric measurements, Acoustic. Oscillations.         Experimental Laboratory 2         ield, microwaves, Xray and gamma rays, geometric optics	ker. Z,ZK enberg uncertaint Z Z	3 y principle, 2 2
quantization of angular 02LCF1 Cavendish experiment 02LCF2 Electric and magnetic 12LT1	dent will be trained to express their ideas clearly and according to current English usage, and become a more confident speak         Quantum Physics         function, postulates of quantum mechanics, Born s statistical interpretation, expectation values, Schrödinger equation, Heise momentum, solution of simple systems, hydrogen atom.         Experimental Laboratory 1         Elasticity. Thermal capacities. Electric measurements, Acoustic. Oscillations.         Experimental Laboratory 2         ield, microwaves, Xray and gamma rays, geometric optics         Laser Technique 1	ker. Z,ZK enberg uncertaint Z Z Z,ZK	3 y principle, 2 2 3
quantization of angular 02LCF1 Cavendish experiment 02LCF2 Electric and magnetic 12LT1 Open resonators. Stab	dent will be trained to express their ideas clearly and according to current English usage, and become a more confident speak         Quantum Physics         function, postulates of quantum mechanics, Born s statistical interpretation, expectation values, Schrödinger equation, Heise momentum, solution of simple systems, hydrogen atom.         Experimental Laboratory 1         Elasticity. Thermal capacities. Electric measurements, Acoustic. Oscillations.         Experimental Laboratory 2         ield, microwaves, Xray and gamma rays, geometric optics	xer. Z,ZK enberg uncertaint Z Z Z,ZK approximation of t	3 y principle, 2 2 2 3 he fundamental
quantization of angular 02LCF1 Cavendish experiment 02LCF2 Electric and magnetic 12LT1 Open resonators. Stab mode. ABCD method.	dent will be trained to express their ideas clearly and according to current English usage, and become a more confident speak         Quantum Physics         function, postulates of quantum mechanics, Born s statistical interpretation, expectation values, Schrödinger equation, Heise momentum, solution of simple systems, hydrogen atom.         Experimental Laboratory 1         Elasticity. Thermal capacities. Electric measurements, Acoustic. Oscillations.         Experimental Laboratory 2         ield, microwaves, Xray and gamma rays, geometric optics         Laser Technique 1         lity. Transverse and Longitudinal Modes. Elements of Open Resonators. Threshold of laser oscillations. Gausian beam as an adverse.	xer. Z,ZK enberg uncertaint Z Z Z,ZK approximation of t	3 y principle, 2 2 2 3 he fundamental
quantization of angular 02LCF1 Cavendish experiment 02LCF2 Electric and magnetic 12LT1 Open resonators. Stab mode. ABCD method. non-coherent pulse pro	dent will be trained to express their ideas clearly and according to current English usage, and become a more confident speak         Quantum Physics         function, postulates of quantum mechanics, Born s statistical interpretation, expectation values, Schrödinger equation, Heise momentum, solution of simple systems, hydrogen atom.         Experimental Laboratory 1         Elasticity. Thermal capacities. Electric measurements, Acoustic. Oscillations.         Experimental Laboratory 2         ield, microwaves, Xray and gamma rays, geometric optics         Laser Technique 1         lity. Transverse and Longitudinal Modes. Elements of Open Resonators. Threshold of laser oscillations. Gausian beam as an a Dptical radiation propagation in resonant medium. Two-level approximation. Equations for polarisation and inversion, dispersion pagation. Optical solitons. Photon echo. Superradiation. Amplified spontaneous emission Lasers without optical resonator.	xer. Z,ZK enberg uncertaint Z Z Z,ZK approximation of t n, saturation. Coh	3 y principle, 2 2 2 3 he fundamental erent and
quantization of angular 02LCF1 Cavendish experiment 02LCF2 Electric and magnetic 12LT1 Open resonators. Stab mode. ABCD method. non-coherent pulse pro 12LT2	dent will be trained to express their ideas clearly and according to current English usage, and become a more confident speak         Quantum Physics         function, postulates of quantum mechanics, Born s statistical interpretation, expectation values, Schrödinger equation, Heise momentum, solution of simple systems, hydrogen atom.         Experimental Laboratory 1         Elasticity. Thermal capacities. Electric measurements, Acoustic. Oscillations.         Experimental Laboratory 2         ield, microwaves, Xray and gamma rays, geometric optics         Laser Technique 1         lity. Transverse and Longitudinal Modes. Elements of Open Resonators. Threshold of laser oscillations. Gausian beam as an a Dptical radiation propagation in resonant medium. Two-level approximation. Equations for polarisation and inversion, dispersion	xer. Z,ZK enberg uncertaint Z Z Z,ZK approximation of t	3 y principle, 2 2 2 3 he fundamental
quantization of angular 02LCF1 Cavendish experiment 02LCF2 Electric and magnetic 12LT1 Open resonators. Stab mode. ABCD method. non-coherent pulse pro 12LT2	dent will be trained to express their ideas clearly and according to current English usage, and become a more confident speak         Quantum Physics         function, postulates of quantum mechanics, Born s statistical interpretation, expectation values, Schrödinger equation, Heise momentum, solution of simple systems, hydrogen atom.         Experimental Laboratory 1         Elasticity.Thermal capacities. Electric measurements, Acoustic. Oscillations.         Experimental Laboratory 2         ield, microwaves, Xray and gamma rays, geometric optics         Laser Technique 1         lity. Transverse and Longitudinal Modes. Elements of Open Resonators. Threshold of laser oscillations. Gausian beam as an a Optical radiation propagation in resonant medium. Two-level approximation. Equations for polarisation and inversion, dispersion pagation. Optical solitons. Photon echo. Superradiation. Amplified spontaneous emission Lasers without optical resonator.         Laser Technique 2       e equation, the laser amplifier, Q-switching, mode-locking	xer. Z,ZK enberg uncertaint Z Z Z,ZK approximation of t n, saturation. Cor Z,ZK	3 y principle, 2 2 2 3 he fundamental erent and
quantization of angular 02LCF1 Cavendish experiment 02LCF2 Electric and magnetic 12LT1 Open resonators. Stab mode. ABCD method. non-coherent pulse pro 12LT2 Laser oscillator, the rat 12LAS	dent will be trained to express their ideas clearly and according to current English usage, and become a more confident speak         Quantum Physics         function, postulates of quantum mechanics, Born s statistical interpretation, expectation values, Schrödinger equation, Heise momentum, solution of simple systems, hydrogen atom.         Experimental Laboratory 1         Elasticity. Thermal capacities. Electric measurements, Acoustic. Oscillations.         Experimental Laboratory 2         ield, microwaves, Xray and gamma rays, geometric optics         Laser Technique 1         lity. Transverse and Longitudinal Modes. Elements of Open Resonators. Threshold of laser oscillations. Gausian beam as an a Optical radiation propagation in resonant medium. Two-level approximation. Equations for polarisation and inversion, dispersion pagation. Optical solitons. Photon echo. Superradiation. Amplified spontaneous emission Lasers without optical resonator.         Laser Technique 2	xer. Z,ZK enberg uncertaint Z Z,ZK approximation of t n, saturation. Cof Z,ZK Z,ZK	3 y principle, 2 2 3 he fundamental ierent and 2 3
quantization of angular O2LCF1 Cavendish experiment O2LCF2 Electric and magnetic 12LT1 Open resonators. Stab mode. ABCD method. non-coherent pulse pro 12LT2 Laser oscillator, the rat 12LAS Pulsed solid state name	tent will be trained to express their ideas clearly and according to current English usage, and become a more confident speak Quantum Physics function, postulates of quantum mechanics, Born s statistical interpretation, expectation values, Schrödinger equation, Heise momentum, solution of simple systems, hydrogen atom. Experimental Laboratory 1 Elasticity.Thermal capacities. Electric measurements, Acoustic. Oscillations. Experimental Laboratory 2 ield, microwaves, Xray and gamma rays, geometric optics Laser Technique 1 ity. Transverse and Longitudinal Modes. Elements of Open Resonators. Threshold of laser oscillations. Gausian beam as an a Optical radiation propagation in resonant medium. Two-level approximation. Equations for polarisation and inversion, dispersion pagation. Optical solitons. Photon echo. Superradiation. Amplified spontaneous emission Lasers without optical resonator. Laser Technique 2 e equation, the laser amplifier, Q-switching, mode-locking Laser Systems	xer. Z,ZK enberg uncertaint Z Z,ZK approximation of t n, saturation. Cof Z,ZK Z,ZK Optical parametri	3 y principle, 2 2 3 he fundamental lerent and 2 3 c generators
quantization of angular O2LCF1 Cavendish experiment O2LCF2 Electric and magnetic 12LT1 Open resonators. Stab mode. ABCD method. non-coherent pulse pro 12LT2 Laser oscillator, the rat 12LAS Pulsed solid state name and raman lasers. Sen	tent will be trained to express their ideas clearly and according to current English usage, and become a more confident speak Quantum Physics function, postulates of quantum mechanics, Born s statistical interpretation, expectation values, Schrödinger equation, Heise momentum, solution of simple systems, hydrogen atom. Experimental Laboratory 1 Elasticity.Thermal capacities. Electric measurements, Acoustic. Oscillations. Experimental Laboratory 2 ield, microwaves, Xray and gamma rays, geometric optics Laser Technique 1 lity. Transverse and Longitudinal Modes. Elements of Open Resonators. Threshold of laser oscillations. Gausian beam as an a Optical radiation propagation in resonant medium. Two-level approximation. Equations for polarisation and inversion, dispersion pagation. Optical solitons. Photon echo. Superradiation. Amplified spontaneous emission Lasers without optical resonator. Laser Technique 2 e equation, the laser amplifier, Q-switching, mode-locking Laser Systems second lasers. Picosecond lasers. High energy laser systems. Laser fusion. Diode-pumped solid state lasers. Tunable lasers.	xer. Z,ZK enberg uncertaint Z Z,ZK approximation of t n, saturation. Cof Z,ZK Z,ZK Optical parametri	3 y principle, 2 2 3 he fundamental lerent and 2 3 c generators
quantization of angular O2LCF1 Cavendish experiment O2LCF2 Electric and magnetic 12LT1 Open resonators. Stab mode. ABCD method. non-coherent pulse pro 12LT2 Laser oscillator, the rat 12LAS Pulsed solid state name and raman lasers. Sen	tent will be trained to express their ideas clearly and according to current English usage, and become a more confident speak Quantum Physics function, postulates of quantum mechanics, Born s statistical interpretation, expectation values, Schrödinger equation, Heise momentum, solution of simple systems, hydrogen atom. Experimental Laboratory 1 Elasticity.Thermal capacities. Electric measurements, Acoustic. Oscillations. Experimental Laboratory 2 ield, microwaves, Xray and gamma rays, geometric optics Laser Technique 1 lity. Transverse and Longitudinal Modes. Elements of Open Resonators. Threshold of laser oscillations. Gausian beam as an a Optical radiation propagation in resonant medium. Two-level approximation. Equations for polarisation and inversion, dispersion pagation. Optical solitons. Photon echo. Superradiation. Amplified spontaneous emission Lasers without optical resonator. Laser Technique 2 e equation, the laser amplifier, Q-switching, mode-locking Laser Systems second lasers. Picosecond lasers. High energy laser systems. Laser fusion. Diode-pumped solid state lasers. Tunable lasers. iconductor lasers for pumping of solid state lasers and diode pumped solid state lasers Amplified spontaneous emission. Ultra	xer. Z,ZK enberg uncertaint Z Z,ZK approximation of t n, saturation. Cof Z,ZK Z,ZK Optical parametri	3 y principle, 2 2 3 he fundamental lerent and 2 3 c generators
quantization of angular O2LCF1 Cavendish experiment O2LCF2 Electric and magnetic 12LT1 Open resonators. Stab mode. ABCD method. non-coherent pulse pro 12LT2 Laser oscillator, the rat 12LAS Pulsed solid state name and raman lasers. Sen power continuous lase 01LIP	tent will be trained to express their ideas clearly and according to current English usage, and become a more confident speak Quantum Physics function, postulates of quantum mechanics, Born s statistical interpretation, expectation values, Schrödinger equation, Heise momentum, solution of simple systems, hydrogen atom. Experimental Laboratory 1 Elasticity.Thermal capacities. Electric measurements, Acoustic. Oscillations. Experimental Laboratory 2 ield, microwaves, Xray and gamma rays, geometric optics Laser Technique 1 ity. Transverse and Longitudinal Modes. Elements of Open Resonators. Threshold of laser oscillations. Gausian beam as an a Optical radiation propagation in resonant medium. Two-level approximation. Equations for polarisation and inversion, dispersion pagation. Optical solitons. Photon echo. Superradiation. Amplified spontaneous emission Lasers without optical resonator. Laser Technique 2 e equation, the laser amplifier, Q-switching, mode-locking second lasers. Picosecond lasers. High energy laser systems. Laser fusion. Diode-pumped solid state lasers. Tunable lasers. iconductor lasers for pumping of solid state lasers and diode pumped solid state lasers Amplified spontaneous emission. Ultra s. Infrared high power lasers. Submilimeter lasers. Lasers with high degree of coherence. Free electron lasers.	xer. Z,ZK enberg uncertaint Z Z,ZK approximation of t n, saturation. Col Z,ZK Optical parametri aviolet lasers. X-ra Z,ZK	3 y principle, 2 2 3 he fundamental ierent and 2 3 c generators ay lasers. High 3

18MAK1	Macroeconomics 1	Z,ZK	4
	ides students with a fundamental theoretical basis for understanding how an economy works. It introduces main macroecono	, ,	•
	rium theory, fundamentals of open economy theory, inflation, unemployment, economic growth, economic fluctuations, basic		
	tions for economic policies. The learning outcomes of the course is to equip students with ability to analyze macroeconomic phe		
		nomena anu men	Interconnections
	e them under the conditions of modern economic life.		
18MAK2	Macroeconomics 2	Z,ZK	4
	ends theoretical knowledge acquired from Macroeconomics I of its students with the latest knowledge of contemporary macro	-	
	cially those with an emphasis on the role of human capital and technological progress. Furthermore, it introduces students to		
-	onomic models derived from microeconomic behavior of subjects and economics and their rational expectations. It also provide	s students with mo	odern knowledge
of labor market modelir	ıg.		
01MAPR	Markov processes	Z,ZK	4
18EKO1	Mathematical Economics 1	Z,ZK	5
	selected models and methods for economic decision making. The main attention is given to optimization models of linear proc		lities of their real
	olving by means of the current software products.	j.ag, pooolo	
18EKO2	Mathematical Economics 2	Z,ZK	5
	I		-
	selected models and methods for economic decision making. The main attention is given to optimization models in graphs, pi rministic and stochastic demand, queuing theory and simulation models.	ioject manageme	n, inventory
		-	-
01MASC	Mathematical Statistics - Seminar	Z	2
	to practical use of statistical methods studied in the course Mathematical Statistics 01MAS. The tutorial deals with calculation		
	ng unbiased estimators with minimal variance, parameter estimation by method of moments and method of maximum likelihoo		ritical regions for
hypothesis testing using	g the Neyman-Pearson lemma and likelihood ratio, calculation of confidence intervals and non-parametric density estimation.		
00MAM1	Essentials of High School Course 1	Z	1
00MAM2	Essentials of High School Math Course 2	Z	1
Review of basics of hig		-	•
01MMPV		КZ	2
-	Mathematical Models of Groundwater Flow	1	
	overview of computational methods for selected groundwater flow problems. The first part of the course is devoted to mathe	matical formulatio	ns of these
problems. The second	part is aimed at selected numerical methods, emphasizing implementation issues related to these methods.	1	
01MMF	Methods of Mathematical Physics	Z,ZK	6
The course provides ar	i introduction to the theory of distributions with applications to solutions of partial differential equations with constant coefficier	nts, further the Fre	dholm theorems
are discussed for the ca	ase of a continuous kernel on a compact set as well as Sturm-Liouville operators on bounded intervals, and applications of th	ne separation of va	ariables method
to the solution of some	boundary value problems and mixed problems.		
18MIK1	Microeconomics 1	Z,ZK	5
Microeconomics is a se	, t of theories, which help us to understand processes by which the scarce resources are allocated among alternative uses. M		plains the role of
	hese processes, and makes more clear behaviour of the economic agents. This course of Microeconomics I consist of introdu		
Consumer Theory.			
18MIK2	Microeconomics 2	Z,ZK	5
	t of theories, helping us to understand process by which scarce resources are allocated among alternative uses. Microecono	, ,	-
	and make clear economic agents behaviour. The lectures of Microeconomics II are oriented on Theory of Firm and Industria	-	
		-	4
11MIK	Logical Circuits and Microprocessors	Z,ZK	4
	luction to the digital electronics for physicists. It describes the function principles of combination circuits, simple sequential cir	rcuits and comple	k circuits like
microprocessors. The n	icrocomputer architecture and principles of interfacing is shown.		
12MPR1	Microprocessors 1	ZK	4
Microprocessor and mi	crocomputer, microprocessor types, memory types CPU, memory, Input output. Code and data, addressing modes( direct, in	direct, register, re	ative,, stack
memory, procedure cal	s, IO devices - program control, interrupt. Microprocessor Microchip PIC16F877A, Instruction codes- Assembler and Macroas	sembler, program	ming languages.
RISC processors - prin	ciples		
12MPR2	Microprocessors 2	ZK	2
	a types and addressing. Memory segmentation and paging. Real and privileged mode. Instruction set, Assembler. description		_
			2
12MOF	Molecular Physics	ZK	2
	omic molecules and molecular matter, and on structure-to-physical properties relations. Methods of molecular structure deter		
12NT	Nanotechnology	ZK	2
Lectures will introduce	students mainly to modern technological methods of preparation of semiconductor, metal and dielectric nanostructures. Phys	sical and chemical	fundaments of
different technologies (	MBE, MOVPE, EBL, sol-gel and colloidal solution) will be explained. Substantive attention will be devoted to epitaxial technol	ogies which are s	ubstantial for
nanostructure preparat	ion. Particular emphasis will be focused on detail characterization of "in situ" and "ex situ" techniques, their applications for he	eterostructure and	nanostructure
growths will be discuss	ed as well. Some supportive technical methods - lithography, diffusion, evaporation, ion implantation, contact and dielectric la	yer preparation w	ill be mentioned
as well as soldering an	d encasement.		
02NSAD	Simulations and Data Analysis Tools	Z	2
	lations of high energy elementary particle collisions. ROOT and Pythia programs.	I	
04NM1	German for Intermediate Students M1	Z	1
	urse is to level off the students' skills in the German language. The course focuses on revision of more difficult phenomena an	-	-
-	ses (e.g. importance of verb prefixes). In the lexical part, it covers topics referring to higher education in both the Czech Repu		
	bgether with all necessary expressions and phrases, expressions and phrases needed to chemists, mathematicians, physicis	is, and the fundar	
	communication on related topics and is aimed at correct pronunciation, grammatical correctness and understandability.	-	4
04NM2	German for Intermediate Students M2	Z	1
	other more complex grammatical structures and their application in communication based on technical texts, such as the relation		
-	ing of the 21st century, linguistically more demanding texts on the environment, the language of mathematics, computers and		
practise reading for info	rmation and reading aloud, and appropriate language for various purposes in oral and written communication. The course system	matically revises o	ther grammatical
phenomena important	or professional discourse (participles, relative clauses).		
04NM3	German for Intermediate Students M2	Z	1
	I	1	
	other more complex grammatical structures and their application in communication based on technical texts, such as the relatio	n between techno	logy and society.
the world at the beginn	ing of the 21st century, linguistically more demanding texts on the environment, the language of mathematics, computers and		
-		d car technology e	tc. Students

04NP1 German for Advanced Students P1	Z	1
This course requires good grammar knowledge, extended general vocabulary, and good communication skills acquired at secondary school to be I	evelled off at the be	eginning of the
course. The course is then focused on working with technical and scientific texts and practising reading techniques (skimming, scanning, reading techniques)	,	
more difficult grammar structures necessary for understanding a subtechnical text (passive voice, participles, participle structures) and it also focuses or	n practical everyday	communication,
04NP2 German for Advanced Students P2		1
The course develops the students' skills in working with professional scientific texts (understanding, summarising, note-taking, interpreting) while exter vocabulary range. It introduces mathematical expressions and texts of nuclear power engineering. Increasing emphasis is placed on understanding ar	<b>a a</b>	
both written and oral (CV, letter of application, interview, scholarship), and more complex grammatical structures (i.e., subjunctive, indirect speech).		communication,
04NP3 German for Advanced Students P3	Z	1
The course consists of 3 main parts (general communicative situations, grammar and technical topics). Students will develop their vocabulary in a v	1 – 1	•
(traffic problems and car accidents, accident report, filling in a form, complaints). Based on presentations and technical and subtechnical texts, the	-	
nuclear power engineering, the environment, computer science, and car technology, will also be extended. Only authentic professional texts are use	ed. By means of a	presentation,
students are trained to process information gained from their reading of complex and difficult texts and present it to the class in a simplified oral form.	The course also inc	udes translation
practice to and from German.		
15CH1   General Chemistry 1	Z	3
The most important concepts, quantities and units used in chemistry are introduced in the course General Chemistry I. Their significance and pract	ical use are illustra	ed by examples
solved in exercises.		
15CH2 General Chemistry 2	Z,ZK	3
The subject is the continuation of the course General chemistry I. The main attention is paid to general principles governing chemical processes. Us		
the validity of these principles is not restricted only to chemical processes is documented. The significance and practical use of explained principles in exercises.	are mustrated by e	examples solved
02OR General Relativity	ZK	3
Introduction to general theory of relativity: principle of equivalence and principle of general covariance, parallel transport and geodesic equation, gr	1 1	-
Einstein's gravitational law. Schwarzschild solution of the Einstein equations, homogeneous and isotropic cosmological models.		
01POPJ1 Computers and Natural Language 1	Z	2
Basic course of computational processing and understanding of natural languages. Automatic methods of morphological and syntactic analysis inc	1 – 1	
of result disambiguation will be discussed. Two-level morphology, tagging and language models, Viterbi algorithm, grammars, chart parsing, probab	-	
01POPJ2 Computers and Natural Language 2	Z	2
The goal of the course is to get acquainted with the broad topic of machine translation (MT). Machine translation is a challenging task that can serve	e as a good examp	le for modeling
of systems as complex as natural languages. We cover several rather different approaches to the task as well as issues related to automatic and m	anual evaluation of	translation
quality.		
12POAL Computer Algebra	KZ	2
Lisp, representation of basic objects (integers, rational and algebraic numbers, polynomials, rational functions, radicals, algebraic functions), arithmeti		
divisor, resultant, derivation, series summation, integration, ordinary differential equations, factorization, equations solving, quantifier elimination, su	-	-
algebraic programming, graphics, Maple - detailed introduction and solving of practical examples, applications, overview of other systems (Axiom, Ma	1	
01POGR1 Computer Graphics 1	Z	2 alagian Further
The first part of the two-semester "Computer Graphics" course is devoted to the specifics of digital display devices spanning from history up to the st a survey of fundamental problems in 2D computer graphics is given together with their solutions. Focus is put on mathematical description of problems a		-
algorithms using knowledge previously obtained in a variety of subjects available at FNSPE. The final part of the course covers the applications of o		
the process of authoring scientific documents and presentations.		
01POGR2 Computer Graphics 2	Z	2
The second part of the two-semester "Computer Graphics" course begins with a brief introduction to signal theory in the context of aliasing - a phenetic and the second part of the two-semester "Computer Graphics" course begins with a brief introduction to signal theory in the context of aliasing - a phenetic and the second part of the two-semester "Computer Graphics" course begins with a brief introduction to signal theory in the context of aliasing - a phenetic and the second part of the two-semester "Computer Graphics" course begins with a brief introduction to signal theory in the context of aliasing - a phenetic and the second part of the two-semester "Computer Graphics" course begins with a brief introduction to signal theory in the context of aliasing - a phenetic and the second part of the sec	nomenon ubiquitou	s in computer
graphics. Further, a well structured survey of fundamental problems in 3D computer graphics is given together with their solutions, from the descrip	tion of a 3D scene	to its realistic
rendering. Focus is put on mathematical description of problems and explanation of the corresponding algorithms using knowledge previously obtain	ed in a variety of s	ubjects available
at FNSPE. The algorithm implementation aspect such as data structures design etc. is also a matter of concern. In the last lecture, a number of the	pretical concepts a	e demonstrated
using Blender, an open-source 3D modeling and rendering software instrument.		
01SITE1   Computer Networks 1	Z	2
Understanding the history and present network (LAN, WAN, use the principles and technologies). Architecture of reference model ISO/OSI. Network TCP/IP communications. Internet services - mail, remote access, www. Secure communication, tunneling. Directory services, certificates, certification		
(PKI). Use in practice. Network security - firewalls (packet filters, proxies, gateways, NAT, DMZ), practical exercises. (According to the interest - the		
01SITE2 Computer Networks 2	Z	2
Understanding the history and present network (LAN, WAN, use the principles and technologies). Architecture of reference model ISO/OSI. Network	1 – 1	
TCP/IP communications. Internet services - mail, remote access, www. Secure communication, tunneling. Directory services, certificates, certification	, , pruolio	
	authorities, public k	ey infrastructure i
(PKI). Use in practice. Network security - firewalls (packet filters, proxies, gateways, NAT, DMZ), practical exercises. (According to the interest - the	-	-
	-	-
	serial control lines,	modems) 2
01POPR Advanced Probability	serial control lines, Z deal with sample a	modems) 2 ind integral
01POPR Advanced Probability The subject is devoted to advanced Theory of probability and statistics on measure-theoretic level for general distributions of random variables. We	serial control lines, Z deal with sample a	modems) 2 ind integral
O1POPR         Advanced Probability           The subject is devoted to advanced Theory of probability and statistics on measure-theoretic level for general distributions of random variables. We characteristics of random variables and convergence criteria. Further, the theory of statistical model estimation and testing is extended for paramet 12PEL1           Practical Electronics 1           Recapitulation of basics electronic, mathematical analyses of circuit solving. Measurement in electronic, measurement of frequency and phase. And	serial control lines, Z deal with sample a ric and nonparame Z,ZK	modems) 2 Ind integral tric cases. 2
O1POPR         Advanced Probability           The subject is devoted to advanced Theory of probability and statistics on measure-theoretic level for general distributions of random variables. We characteristics of random variables and convergence criteria. Further, the theory of statistical model estimation and testing is extended for paramet           12PEL1         Practical Electronics 1           Recapitulation of basics electronic, mathematical analyses of circuit solving. Measurement in electronic, measurement of frequency and phase. And digital signal processing. Function of voltmeter, ampermeter, oscilloscope, spectral analyser and logical analyser.	serial control lines, Z deal with sample a ric and nonparame Z,ZK alogue to digital co	modems) 2 Ind integral tric cases. 2 Inverters and
O1POPR         Advanced Probability           The subject is devoted to advanced Theory of probability and statistics on measure-theoretic level for general distributions of random variables. We characteristics of random variables and convergence criteria. Further, the theory of statistical model estimation and testing is extended for paramet           12PEL1         Practical Electronics 1           Recapitulation of basics electronic, mathematical analyses of circuit solving. Measurement in electronic, measurement of frequency and phase. And digital signal processing. Function of voltmeter, ampermeter, oscilloscope, spectral analyser and logical analyser.           12PEL2         Practical Electronics 2	serial control lines, Z deal with sample a ric and nonparame Z,ZK	modems) 2 Ind integral tric cases. 2
O1POPR         Advanced Probability           The subject is devoted to advanced Theory of probability and statistics on measure-theoretic level for general distributions of random variables. We characteristics of random variables and convergence criteria. Further, the theory of statistical model estimation and testing is extended for paramet           12PEL1         Practical Electronics 1           Recapitulation of basics electronic, mathematical analyses of circuit solving. Measurement in electronic, measurement of frequency and phase. And digital signal processing. Function of voltmeter, ampermeter, oscilloscope, spectral analyser and logical analyser.           12PEL2         Practical Electronics 2           Noise analyses in electronics, low noise electronics system design. Noise measurement. Time measurement. Printed circuit design.	serial control lines, Z deal with sample a ric and nonparame Z,ZK alogue to digital co Z,ZK	modems) 2 Ind integral tric cases. 2 Inverters and 2
O1POPR         Advanced Probability           The subject is devoted to advanced Theory of probability and statistics on measure-theoretic level for general distributions of random variables. We characteristics of random variables and convergence criteria. Further, the theory of statistical model estimation and testing is extended for paramet           12PEL1         Practical Electronics 1           Recapitulation of basics electronic, mathematical analyses of circuit solving. Measurement in electronic, measurement of frequency and phase. And digital signal processing. Function of voltmeter, ampermeter, oscilloscope, spectral analyser and logical analyser.           12PEL2         Practical Electronics 2           Noise analyses in electronics, low noise electronics system design. Noise measurement. Time measurement. Printed circuit design.           12PIN1         Practical Informatics for Technics 1	serial control lines, Z deal with sample a ric and nonparame Z,ZK alogue to digital co Z,ZK	modems) 2 ind integral tric cases. 2 nverters and 2 2 2 2
O1POPR         Advanced Probability           The subject is devoted to advanced Theory of probability and statistics on measure-theoretic level for general distributions of random variables. We characteristics of random variables and convergence criteria. Further, the theory of statistical model estimation and testing is extended for paramet           12PEL1         Practical Electronics 1           Recapitulation of basics electronic, mathematical analyses of circuit solving. Measurement in electronic, measurement of frequency and phase. And digital signal processing. Function of voltmeter, ampermeter, oscilloscope, spectral analyser and logical analyser.           12PEL2         Practical Electronics 2           Noise analyses in electronics, low noise electronics system design. Noise measurement. Time measurement. Printed circuit design.           12PIN1         Practical Informatics for Technics 1           Computer and operating systems. Personal computer, workstation and supercomputers. Processor, memory, bus, devices, hard disk, network interformation and supercomputers. Processor.	serial control lines, Z deal with sample a ric and nonparame Z,ZK alogue to digital co Z,ZK Z,ZK	modems) 2 Ind integral tric cases. 2 nverters and 2 2 software.
O1POPR         Advanced Probability           The subject is devoted to advanced Theory of probability and statistics on measure-theoretic level for general distributions of random variables. We characteristics of random variables and convergence criteria. Further, the theory of statistical model estimation and testing is extended for paramet 12PEL1           Practical Electronics 1           Recapitulation of basics electronic, mathematical analyses of circuit solving. Measurement in electronic, measurement of frequency and phase. And digital signal processing. Function of voltmeter, ampermeter, oscilloscope, spectral analyser and logical analyser.           12PEL2         Practical Electronics 2           Noise analyses in electronics, low noise electronics system design. Noise measurement. Time measurement. Printed circuit design.           12PIN1         Practical Informatics for Technics 1           Computer and operating systems. Personal computer, workstation and supercomputers. Processor, memory, bus, devices, hard disk, network interformic principles of operating systems. Requirements on operating system for research and technical computing. Operating system UNIX. Basic principles, kerniciples of operating system UNIX. Basic principles, kerniciples of operating system UNIX. Basic principles, kerniciples of operating system System UNIX. Basic principles, kerniciples of operating systems.	serial control lines, Z deal with sample a ric and nonparame Z,ZK alogue to digital co Z,ZK Z,ZK Acc. Hardware and nel, kernel services.	modems) 2 Ind integral tric cases. 2 nverters and 2 2 software. Documentation.
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O1POPR         Advanced Probability           The subject is devoted to advanced Theory of probability and statistics on measure-theoretic level for general distributions of random variables. We characteristics of random variables and convergence criteria. Further, the theory of statistical model estimation and testing is extended for paramet 12PEL1           Practical Electronics 1           Recapitulation of basics electronic, mathematical analyses of circuit solving. Measurement in electronic, measurement of frequency and phase. And digital signal processing. Function of voltmeter, ampermeter, oscilloscope, spectral analyser and logical analyser.           12PEL2         Practical Electronics 2           Noise analyses in electronics, low noise electronics system design. Noise measurement. Time measurement. Printed circuit design.           12PIN1         Practical Informatics for Technics 1           Computer and operating systems. Personal computer, workstation and supercomputers. Processor, memory, bus, devices, hard disk, network interformic principles of operating systems. Requirements on operating system for research and technical computing. Operating system UNIX. Basic principles, kerniciples of operating system UNIX. Basic principles, kerniciples of operating system UNIX. Basic principles, kerniciples of operating system System UNIX. Basic principles, kerniciples of operating systems.	serial control lines,         Z         deal with sample a         ric and nonparame         Z,ZK         alogue to digital co         Z,ZK         ace. Hardware and nel, kernel services.         rocesses, process s	modems) 2 Ind integral tric cases. 2 nverters and 2 2 software. Documentation. status, computer
O1POPR         Advanced Probability           The subject is devoted to advanced Theory of probability and statistics on measure-theoretic level for general distributions of random variables. We characteristics of random variables and convergence criteria. Further, the theory of statistical model estimation and testing is extended for paramet 12PEL1           Practical Electronics 1           Recapitulation of basics electronic, mathematical analyses of circuit solving. Measurement in electronic, measurement of frequency and phase. And digital signal processing. Function of voltmeter, ampermeter, oscilloscope, spectral analyser and logical analyser.           12PEL2         Practical Electronics 2           Noise analyses in electronics, low noise electronics for Technics 1         Computer and operating systems. Personal computer, workstation and supercomputers. Processor, memory, bus, devices, hard disk, network interf           Principles of operating systems. Requirements on operating system for research and technical computing. Operating system UNIX. Basic principles, kerr           File system, file atributes, working with files. Text editors: vi, emacs. Command interpreter (shell) sh, csh and its programming (scripts). Controlling prioda a process priorities. Standard tools. Graphical user interface X-windows. Computer networks. Local computer networks. Global computer networks. Global computer networks. Measurement networks. Action of a computer. Network services: hardware sharing, mail, ftp, etc. Network applications	serial control lines,         Z         deal with sample a         ric and nonparame         Z,ZK         alogue to digital co         Z,ZK         ace. Hardware and nel, kernel services.         rocesses, process s	modems) 2 ind integral tric cases. 2 nverters and 2 2 software. Documentation. itatus, computer
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12PIN3 Practical Informatics for Technics 3	Z	2
Practically oriented three semester course of basics and applications of informatics for science and engineering included as obligatory alternative	course. Constituent	part is realized
in computer classrooms. The third part of the course is "Introduction to scientific computing?.		
15INPR Laboratory Practice in Instrumental Methods	KZ	4
Practical training of students in the use of selected modern instrumental methods and techniques for solving some physico-chemical analytical and	-	The training is
carried out in the laboratories of Czech Academy of Sciences (Institute of Physical Chemistry) and partly in laboratory at the Department of Nucle	· · · ·	
01PRA1 Probability and Mathematical Statistics 1	Z,ZK	6
The subject is devoted to the introduction to Theory of probability and statistics on measure-theoretic level for discrete models, continuous distribu	-	
random variables. We deal with sample an integral characteristics of random variables and variants of limit theorems are derived (LLN, CLT). This	nowledge is furthe	er applied to the
statistical processing of observations and statistical parametric model estimation.		
01PRA2 Probability and Mathematical Statistics 2	ZK	2
The subject is devoted to the statistical techniques for estimation and testing within parametric and nonparametric models such as Maximum likelihoo		
tests, Goodness of fitness tests of models, confidence regions, etc. We focus on real practical applications of these statistical techniques in frame		
01PRST   Probability and Statistics	Z,ZK	4
It is a basic course of probability theory and mathematical statistics. The probability theory is build gradually beginning with the classical definition definition. The notions as random variable, distribution function of random variable and characteristics of random variable are treated and basic lim	-	- 1
On the basis of this theory the basic methods of mathematical statistics such as estimation of distribution parameters and hypothesis testing are e		teu anu proveu.
	KZ	4
01PRSTB   Probability and Statistics B It is a basic course of probability theory and mathematical statistics. The probability theory is build gradually beginning with the classical definition	1	
definition. The notions as random variable, distribution function of random variable and characteristics of random variable are treated and basic lim	-	-
On the basis of this theory the basic methods of mathematical statistics such as estimation of distribution parameters and hypothesis testing are e		
16UAZB Principles of Ionizing-Radiation Applications	ZK	2
Historical outline of applications, review of interaction of radiation with a matter, radiation sources, detectors and instrumentation, evaluation of rad	1	
penetration and scattering of radiation beams, selected radioanalytical methods, tracer methods, radionuclide dating, further possibilities for the us		
16FNZB Problems of Non-ionizing Radiation	ZK	2
Subject is focused on biological effects of non-ionizing radiation and its use in physical praxis. Information about principles, biological effects and n	1	
resonance and ultrasound as applied in various types of technical or medical equipment are given as well.		
12PSEM Problem Seminary	Z	2
25 seminaries with topics from the region of solid materials engineering, physical electronics, materials science, nuclear reactors, dosimetry and a	pplication of ioniza	ting radiation.
01PROP Programmer's Practicum	Z	2
The purpose of this course is to acquire good programming habits which will help in writing of clean code, i.e. such that is easy to comprehend by		. –
functionality. Using specific examples, the students get familiar with naming conventions, and continue through writing project documentation, principal students and continue through writing project s		- 1
debugging, up to creating object-oriented design, design patterns and refactoring.		
01PERI Programming of Peripherals Devices	Z	2
Memory organization, input and output ports, computer bus. Software libraries for computer peripherals, 3D graphic libraries. Principles of periphe	als device drivers.	1
01PW Windows Programming	Z	2
Simple graphical programs for MS Windows. Basic editing controls. File input and output. User defined components, dynamic type identification an	d reflection.	1
18PRC1 Programming in C++ 1	Z	4
This course covers mainly the C programming language and non-object oriented features of the C++ language.	1	1
18PRC2 Programming in C++ 2	KZ	4
This course covers the object oriented programming and othesr advanced constructs in the C+;+ programming language and the Standard Templa	1	-
18PJ Programming in Java	Z,ZK	5
This course is devoted to the Java platform and to the development of the basic types of applications for this platform.	1 ,	-
18MTL Programming in MATLAB	Z,ZK	5
Introducing Matlab environment as efficient tool for computation in complex arrays and symbolic variables, namely for linear algebra, mathematic a		-
and geometric representation of results.		
18MPT Programming in MATLAB	KZ	5
The subject acquaints students with various programming techniques in the Matlab environment. The emphasis is placed on the differences in pro	1	logy in Matlab
compared to classical languages.		
18PAS Pascal Programming	Z	4
This lecture is intended mainly for students, with little or no experience in programming. It familiarizes the students with the basic concepts in prog	amming and with t	he Pascal
programming language.		
12PDR1 Data Communication and Interfaces 1	Z	2
Principles of computer networks, networks architectures and data transfer. Specification of existing network architectures.	1	1
12PDR2 Data Communication and Interfaces 2	Z	2
Principles of Ethernet standards and basics of protocol suite TCP/IP.	1	1
01PSL LaTeX - Publication Instrument	Z	2
The course is devoted to the basics and facilities of computer typography, particularly to the system LaTeX	1	1
02RQGP1 Seminar on Quark-Gluon Plasma 1	Z	1
The aim of the seminar is discuss the selection of the most fundamental articles in heavy ion physics.	1	1
02RQGP2 Seminar on Quark-Gluon Plasma 2	Z	1
The aim of the seminar is discuss the selection of the most fundamental articles in heavy ion physics.	1	1
04RM1 Russian for Intermediate Students M1	Z	1
The course is designed for students with previous knowledge of Russian from secondary schools. Students are supposed to know the Russian alph	abet (both printed a	and handwritten),
basic vocabulary for communication in everyday situations (introductions, socializing, greetings, shopping for food and objects of everyday need, as	king the way and g	iving directions),
they can use basic grammar structures (verbal and nominal forms, irregular verbs, pronouns). The initial knowledge corresponds to the achievement	nt level of the RZ2	course. The
contents and scope of the course correspond approximately to the RZ3 course, but for half of the time allotted in the timetable.		
04RM2 Russian for Intermediate Students M2	Z	1
The course is based on the RM1 course, its contents and scope correspond roughly to RZ4, however, for half of the time allotted in the timetable.		
04RM3 Russian for Intermediate Students M3	Z	1
The course develops the knowledge and skills acquired in RM1 and RM2 and its contents and scope are roughly at the same level as those of RZ5,	however, for half of	the time allotted
in the timetable.		

The element regiment of the Acceleration Stage and even the second associated and an element of the second associated and an element of the second associated and an element of the second associated	04RP1 Russian for Advanced Students P1	Z	1 cult grammar
The courses is based on RF1 in appends gummatical sections important to understanding technical total (purchas) participates, passions, jurk apparts, specific syntactic syntactics durations in a course is based on RF2 and in amplitude on an available control interinstant on interinstantia on			cuit grannai
enclands. Since is prior in relation to any entition communication.           CARP3         IL subsinit for Advanced Students P3         IL         1           The outsine topic approximal prior barrend topic approximation to the prior barrend topic approx			
The course search of PE2 and a many focused on search system to consider with income a society fits basis fragment language and spread many an		verb aspects, spe	ecific syntactic
course require pool prevous involves prevous prevous prevous prevous prevous prevous and excellent excellent and excellent excellent and excellent and excellent excellent and excellent excelle	04RP3 Russian for Advanced Students P3	Z	1
These south E-structure trucky is almost at professional and technical skills (reading exchange) to the subsetting "specialization, or provide south at the souther the souther technical backs in the source and and the control or technical backs in the source and and the control or technical backs and exchange and the source and the so		-	
conclust press         A matching to produce use, and communication in producesional abautions. They will be able to both speak write accumulately and write confidence on technical topics.         I           CAR21         Russian for Beginners 2.1         I           The course appreciation is the instage of the theoremeter programs, is that aim being reading and understanding protessional tests written in Russian. Thus telling with the theoremeter programs is the instage of the theoremeter programs is the instage of the advect abare programs is commented and the programms is commented and the confidence on technical project of the advector bard advectorial programs. Subject will be able to easi a divide test with a matching actional stress. They all builts develop that reactual programs is based on the advectorial programs. Subject will be able to use it in writers.         I			
The cursue represents the first stage of the file-sense programme, its find aim being reading and understanding professional lates within stages. Thus it bugins with nearestering in the Oussian Protocol Stage of the Stage and Stage of Stage of the Stage and Stage	develop their subtechnical vocabulary and practice quick and correct communication in professional situations. They will be able to both speak write	-	-
In R-Basen alphabet (for text reading and writing skills) and fundamentals of grammar necessary for everyday communication (titsening and speaking). Students will be able to read a hort text with marked attrass, understand its content and survivance its communication in everyday situations and for reading easy and short subtechnel leads. Students will be able to communicate using short subtechnel leads. Students will be able to any other subtechnel leads. Students will be able to communicate using short subtechnel leads. Students will be able to any other subtechnel leads. Students will be able to communicate using short subtechness and appropriate structures, and read alloud with ordiference a short text without marked stress. They will be able to respond a set of the course is bales of the reads of the subtechness of	· · · · · · · · · · · · · · · · · · ·	1	1
a net or ultimated atess, understand is contents and summarize it.           OPRZ2         Russian for Deginners 22.         1           The second semaster of the programme is designed to teach skills for basic communication in workday situations and for trading easy and to suborbinical tests. Students will be a too normalize using short seminorms. They will have mastered with confidence the Russian alphabet and will be able to use it in writing, and includes further nergenal to be students. They will have mastered with confidence the Russian alphabet and will be able to use it in writing, and includes further nergenal to as to be and includes further nergenal to as to be additionation pattern with interaining to species flaguage. They will be able to respin 4 to a to a to understand, and to express their option. Writing skills will be traned on quiced writing tasks and roce-taking.         2         1           CARZ4         Russian for Deginners 2.4         1<		-	-
The second semister of the programme is designed to teach skills for basic communitation in weydy situations and for reading easy and that subsectional tests. Students will be able to complete and activates. They will have mastered with confidence the Russian alphabet and will be able to use it in writing.  QR23 [Russian for Deginners 23] The course is based on R22 and includes further everyday bpics, develops understanding of abort compact texts on new subschrifted typics of training various forms of reading able to use it in writing.  QR24 [Russian for Deginners 23] [2] The course is based on R22 and includes further everyday bpics, develops understanding of abort compact texts on new subschrifted typics (for training various forms of reading able to use its or the advection, and to sepress their options. Writing sails will be trained to distinguish information patterns while software for the software for tware for the software for the softwa		(ing). Oraconic min	
able to communicate using storie sinteness and appropriate structures, and read about with confidence is how tone whole not the withing.           OdR23         Russian for Beginners Z3         Image: Communicate structures is the stories of the			1
master turbur grammatical structures. They will have mastered with confidence the Russian in dro Beginners 22. 1 The course is based on R22 and includes further ownychty topics, devolves understanding of short compact taxts on new subtechnical decision for the furnal or decision devolues to the provide to the to respond so as to be understood, and to express their ophinon. Writing salls will be trained to display inhoration patterns while istaning to grace the language. They will be able to respond so as to be understood, and to express their ophinon. Writing salls will be trained to display inhoration patterns while istaning to grace the subtechnical decision grant are turbures. (In the express in verb ophical responds the knowledge of general language in all our skills (reading and understanding decision on nor specific topics (environment, additions, the green encouncil at the subtechnical buscen encouncil turbures in the time table, is and practice and devolp communication table to express the subtechnical decision on nore specific topics (environment, additions, the green encouncil turbure and environs) and practice and devolp communication shalls for encrytally situations (food marking, estrating and summarizing and summarizes to a specificat data and summarizing and topical replaces. (In the course of their management of Suffavare Procipics for the course of their management of Suffavare Procipics for their and and expressional subjective subject and their courses of their management and subjective subjects and there and to market and their courses of their management and subject to the subject and their subjects and their subje			
The course is based on RZ2 and incluses turber everyday topics, develops understanding of short compact texts on new subtechnical topics for training various torms of reading skills and interfaces and introduces new grammars. Boatem will be trained to display in introduce new grammars. Boatem will be trained to display in introduces new grammars. Boatem will be trained to display the introduces new grammars. Boatem will be trained to display and non-staining. Interface the every day statutors (foot and the every day statutors)) and the every da		also develop their	
and testing) and introduces new grammar: Students will be trained or guided wirling tasks and note-taking:           QHR24         Russian for Beginners 24         1           The course backer on VMR23, till wirling tasks and note-taking:         Z         1           The course backer on VMR23, till wirling tasks and note-taking:         Z         1           The course backer on VMR23, till moves and expands the knowledge of general language in all four skills (reading and understanding longer test). Students are trained to use grammar structures differences in web patterns from Caucher backer on the file students, constitutions, the graen movement. They become acquainted with various geographical data (e.g., siberia), learn hour to till in forms, look use completed R24. It concentrates proceedmants and the file students and the file students and the student to the student to have completed R24. It concentrates proceedmantally on students and use in protessional tests, is understanding, estimatication, wells are backer to have completed R24. It concentrates proceedmantally on students and use in protessional in tests, and use mandate taking and the professional tests, is understanding, estimatication (veb adapted wells), passive vice). Students develp their technical and economic vacobulary, and are also trained in some protessional skills (verifing a CV, polite nequest, ec.)         QLR2         QL           OTRSVMP         Project Management of Software Projects         AZ         Q         QL           The course structure corresponds to a structure on the metally, develop the structure on the structure on the structure of th	04RZ3 Russian for Beginners Z3	Z	1
understood, and to express their opinion. Writing abilits will be trained on guided writing tasks and note-taking.		-	-
ORE24         Russian for Beginners Z4         1           The course is based on ORE23. Hinpows and expands the knowledge of general language in all four skills (reading and understanding longer test). Students are trained to use gramma structures difficultary (e.g., irregular worth, differences in velo patitims communication in everyday stuations, writing longer test). Students are trained to use gramma structures difficultary (e.g., irregular worth, differences in velo patitims communication on markes, conditionals). They practice and all develop communication skills for werking visuations (foot, reaeling, kerk in the timestable, learn about Russian haldings and typical meets.           QRZ5         Russian for Beginners Z4.         1           The course based in a specialize disk (indivision). It is great marked to all professional lots), i.e. undestanding, extracting and summarking information from a specialize disk and a patients. Communication wills are trained on everyday topics. Studying grammar is based on professional and technical tests and only includes terms physical disk (writing a CV, Deller equest, etc.).           ORSWP         Project Management of Software Projects is deveload in question and allo representable and extra with any other aspects which have to be taken into account of their managements. Specific antenion in a patients of the project management and to Typical projects inducting many other aspects which have to be taken into account of their managements. Specific antenion in a patients of the project management and to Typical projects inducting with have to be taken into account of their managements. Specific antenion is patient and their projects on allows of the student?s bachedue theses with have to be taken into account in any account of their managements. Specific antenion account of the student?s bachedu		be able to respond	I SO AS TO DE
The course is based on 04423. It improves and expands the knowledge of general language in all four skills (reading and understanding longer texts with a certain percentage of undermixed in a every day situations, writing longer texts). Students are trained to use grammar structures effectively (e.g., irregular veck, differences in verb patterns from Czech, modality, imperatives, conditionals). They practice and develop communication skills for everyday situations (food, traveling, free time), and practices or it with a trained to use grant text in the trained text is and to use the intermation. They become acquirated with various gengraphical data (e.g., Stellar), and practices and text in the trained to a separate text in the text. Communication skills are trained on every data text in the trained to a separate text in the text. Communication skills (reinting a CV, police trained to the curs of their management. Specific text is a patient text in the trained text in the text in the text is a set to a betwee projects in diverse project in the semant at to ill projects in general laters and procestures which are common to many projects of very diverse extracts: The course project management as to ill projects in diverse project in the semant is a provide to many projects of very diverse extracts. The course project management and to fragma text is a supposed to the set text is to unmagement. Specific text is the semant of the text course extracts in the text course develop text is a supposed to the set text is to unmany many text is a diverse angle and text is a diverse		Z	1
patterns from Czech, modałły, imperatives, conditionalis). They practice and develop communication skills for weryday situations (food, traveling, free irine), and practice and develop communication skills for weryday situations (food, traveling, free irine), and practice and develop communication skills (working with professional texts, i.e. understanding, extracting and summarizing information from a specialized text) and speaking, and to a certain extent, writing about the professional information obtained by useding the texts. Communication skills are travel or everyday texts, busing grammar is based on professional and technical texts and only includes items typically used in professional communication (wetlaw are travel or everyday texts). Students develop their technical and economic vocabulary, and are altor travel in some professional about (writing a CV, potter request, etc.) OTRSWP Project thranagement of software projects to develop their technical and economic vocabulary, and are alto travels, nues and procedures which are common to many projects of very downse character, the course Project management of software projects in general. Interdisciplinary view of project management is enfly and granical of general lease, rules and procedures which have to be texts. The course of their management as of the sudent's backhore the sature for the summaria is to luminate material physics by virtue of solved examples. It is supposed that the texteners of the physics department will present simple tasks concerning their solveling in provides a different approach to hoose fields of mathematics 1 and exist andexist and	The course is based on 04RZ3. It improves and expands the knowledge of general language in all four skills (reading and understanding longer text		-
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01SMB2       Seminar on Calculus B2       Z       2         The course is devoted to support the lectures of Calculus B4.       01SOS1       Software Seminar 1       Z       2         Java, Java Beans, Assembly language programming for microprocessors Intel 80x86       Z       2         01SOS2       Software Seminar 2       Z       2         Graphical libraries GTK+ and Qt. Development of graphical user interface using C and C++ programming languages. Portable applications for Unix like operating systems, especially for Linux systems. Portability to Microsoft Windows.       Z       2         02SPRA1       Special Practicum 1       KZ       6         Physics measurement focused on instrumental techniques that are mainly used in physics and technical professions. Topics of each parts are chosen so that students can familiarize with advanced pats of experimental physics and metrology.       6         O2SPRA2       Special Practicum 2       KZ       6         Physics measurement focused on instrumental techniques that are mainly used in physics and technical professions. Topics of each parts are chosen so that students can familiarize with advanced pats of experimental physics and metrology.       6         O1STR       Statistical Decision Theory       ZK       2         O1STR       Statistical techniques for general decision procedures based on optimization of suitable stochastic criterion, their mutual comparisons with respect to their		Z	2
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01SOS1       Software Seminar 1       Z       2         Java, Java Beans, Assembly language programming for microprocessors Intel 80x86       01SOS2       Software Seminar 2       Z       2         Graphical libraries GTK+ and Qt. Development of graphical user interface using C and C++ programming languages. Portable applications for Unix like operating systems, especially for Linux systems. Portability to Microsoft Windows.       Z       2         02SPRA1       Special Practicum 1       KZ       6         Physics measurement focused on instrumental techniques that are mainly used in physics and technical professions. Topics of each parts are chosen so that students can familiarize with advanced pats of experimental physics and metrology.       6         02SPRA2       Special Practicum 2       KZ       6         Physics measurement focused on instrumental techniques that are mainly used in physics and technical professions. Topics of each parts are chosen so that students can familiarize with advanced pats of experimental physics and metrology.       6         O1STR       Statistical Decision Theory       ZK       2         The subject is devoted to the statistical techniques for general decision procedures based on optimization of suitable stochastic criterion, their mutual comparisons with respect to their			2
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Graphical libraries GTK+ and Qt. Development of graphical user interface using C and C++ programming languages. Portable applications for Unix like operating systems, especially for Linux systems. Portability to Microsoft Windows.         02SPRA1       Special Practicum 1       KZ       6         Physics measurement focused on instrumental techniques that are mainly used in physics and technical professions. Topics of each parts are chosen so that students can familiarize with advanced pats of experimental physics and metrology.       KZ       6         O2SPRA2       Special Practicum 2       KZ       6         Physics measurement focused on instrumental techniques that are mainly used in physics and technical professions. Topics of each parts are chosen so that students can familiarize with advanced pats of experimental physics and metrology.       6         O2SPRA2       Special Practicum 2       KZ       6         Physics measurement focused on instrumental techniques that are mainly used in physics and technical professions. Topics of each parts are chosen so that students can familiarize with advanced pats of experimental physics and metrology.       6         O1STR       Statistical Decision Theory       ZK       2         The subject is devoted to the statistical techniques for general decision procedures based on optimization of suitable stochastic criterion, their mutual comparisons with respect to their			
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with advanced pats of experimental physics and metrology.         01STR       Statistical Decision Theory       ZK       2         The subject is devoted to the statistical techniques for general decision procedures based on optimization of suitable stochastic criterion, their mutual comparisons with respect to their		1	-
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		a compansons with	n respect to their

11SFBM	Structure and Function of Biomolecules	Z.ZK	3
	I	1 / 1	-
e e	lecular structure is crucial for the understanding of its function. The subject is focused on the introduction to building blocks of	macromolecules,	overall structure
	n relationship including macromolecular complexes.		
04SM1	Spanish for Intermediate Students M1	Z	1
The course is designed	for students whose competence is at level B1 of CEFR, i.e. those who studied Spanish in the secondary school. The 3-seme	ester course devel	ops standard
vocabulary and pays at	tention to further grammar topics (e.g., perífrasis verbales, futuro imperfecto, direct object and indirect object pronouns, nega	ative form of the im	perative, and
subjunctive), to written	and oral communication on a given everyday or easy subtechnical topic, for which the students are trained by reading texts o	r listening to them	1.
04SM2	Spanish for Intermediate Students M3	7	1
	e students' knowledge from the previous course (SM1). Students are gradually acquainted with fundamentals of Spanish for	specific purposes	in order to be
	alized texts on the Internet.	-F	
		7	1
04SM3	Spanish for Intermediate Students M3	I – I	1
	upplemented with additional subtechnical materials, so the students will be gradually acquainted with the peculiarities of acad		
	net in Spanish and search for information of their specialization or field of interest. Students will use the information to write s	short articles and s	summaries. The
final part of the progran	nme, general Spanish course based on course books, covers presentations and, finally, a written and oral examination.		
04SP1	Spanish for Advanced Students P1	Z	1
Course concentrates or	n more difficult grammar topics, revision of vocabulary, basics of Spanish for specific purposes as well as written communicat	ion. Course prerec	quisites: level B2
of CEFR.			
04SP2	Spanish for Advanced Students P2	Z	1
		1 1	•
	ond part of the advanced Spanish course, extending Spanish for specific purposes topics. It comprises more grammar and sy	max and locuses	on independent
written communication.			
04SP3	Spanish for Advanced Students P3	Z	1
Course 04SP3 is the fin	al part of the advanced Spanish course. It is based on texts chosen by the students according to their future specialization. It is	focused on writter	n communication
based on what students	s will need in their career.		
04SZ1	Spanish for Beginners Z1	Z	1
	st stage of the five-semester programme of Spanish studies; during the first stage the students will master phonetics and fun	1 – 1	r structures and
	cate at an elementary level on topics of everyday life. They will acquire and extend fundamental vocabulary of general Spanis	•	
04SZ2	Spanish for Beginners Students Z2	Z	1
	I on course 04SZ1, and expects students to develop and extend the knowledge and skills acquired so far. Grammar structure		
to enable them to unde	rstand short adapted written texts and speech. Attention is also paid to cultural differences between Spanish-speaking counti	ries and others su	ch as the Czech
Republic. Realia of Spa	nish-speaking countries are also included.		
04SZ3	Spanish for Beginners Z3	Z	1
The course is based on	course SZ2, and develops the student's vocabulary and grammar structure. The course covers realia (history and culture) o	f the Spanish-spe	aking countries,
	attention to further grammar topics (pretérito perfecto, pretérito indefinido, pretérito imperfecto, the gerund and the imperativ		
	ren general topic, for which the student is trained by reading texts or listening to them.	-,	
04SZ4		7	1
	Spanish for Beginners Z3	· – ·	l tuise ann inte af
	course SZ3. It develops the student's vocabulary and extends the knowledge of the culture and social customs of the Spani		
	to further grammar topics (perifrasis verbales, futuro imperfecto, direct object and indirect object pronouns, negative form of	the imperative, an	d subjunctive),
to written and oral com	munication on a given general or subtechnical topic, for which the student is trained by reading texts or listening to them.		
04SZ5	Spanish for Beginners Z5	Z	1
The course books are s	upplemented with additional subtechnical materials, so the students will be gradually acquainted with peculiarities of Spanisl	h for specific purp	oses. In its final
part, the general Spanis	sh course based on the course book will end with presentations and, finally, a written and oral examination.		
14TM	Engineering Mechanics	Z,ZK	4
	a link-up between the theoretical mechanics of rigid bodies and engineering disciplines dealing with the stress and strain and	1 1	
		1	
12TAIS	Ion Beam Techniques and Applications.	ZK	3
Production and forming	of ion beam, charged particle optics, interaction of ion with solid matter, technological and analytical applications.		
TV-1	Physical Education	Z	1
TV-2	Physical Education	Z	1
TV-3	Physical education	Z	1
TV-4	Physical education	Z	1
01DYSY	Theory of Dynamic Systems	ZK	3
	introduction to system theory with emphasis on control theory and understanding of the fundamental concepts of systems a	1 1	-
	f the dynamical behavior of systems as well as provide the necessary mathematical background. Internal and external system	-	
-	ariable, impulse response and transfer function, polynomial matrix, and fractional representations. Stability, controllability, obs	-	
	hasis always being on fundamental results. State feedback, state estimation, and eigenvalue assignment are discussed in detail.		
	using polynomial and fractional system representations. The emphasis in this primer is on linear time-invariant systems, both	-	
01TKO	Theory of Codes	ZK	2
Algebraic methods use	in error detecting and error correcting codes.		
01TOP	Topology	ZK	2
The aim of lecture is the	e systematization and deepening the knowledge of general topology.	. '	
16MCRB	Transport of Ionizing Radiation and Monte Carlo Method	Z,ZK	4
	s of Monte Carlo method and its use for radiation transport simulation, selected concepts of probability theory and mathemat	I	
		-	
	ypes of radiation and their use for stochastic modeling of their substance transport. Model description concepts, geometric m		
, · · · · ·	of measured variables and parameters. Statistical evaluation of reliability of modeling results, variance reduction methods, pro	•	
	NP program, its possibilities and use. Procedures for the practical use of the program for typical tasks in the field of dosimetr	y, application of ic	mizing radiation,
detection and detection	systems, radiation protection and medical applications.		
18INTA	Development of internet applications	KZ	4
The lectures provide an	overview of modern technologies for the development of web applications. Students will learn basic web languages and con	cepts (HTML, UR	L, etc.) and they
will also be introduced	to relational database systems. The tutorials are dedicated to practical examples of building web applications, from the simple	est to more advan	ced. The course
is oriented primarily tow	vards backend technologies and using the Python languages, but covers also frontend frameworks and JavaScript.		

01DYK This course is an introdu			
This course is an introdu	Introduction to Continuum Dynamics	Z	2
	action to the mathematical description of continuum dynamics. It summarizes the necessary mathematical apparatus with em	•	
	ns, and integration on manifolds. It includes the basic concepts of continuum mechanics such as strain and stress tensors or		
	derive the fundamental laws of conservation of mass, momentum, angular momentum, and energy in integral and differential in a second participation of the second	form. In the last pa	art of the course,
	are adapted to the case of viscous and inviscid fluid and linear and nonlinear elastic body.	1/7	
16ZIVB	Introduction to Ecology	KZ	2
indicators and sustainal	t basic of the ecologic principles, terms and ideas. It covers overview information regarding to particular components of the en	vironment and eva	aluate economic
02UFEC		7	
	Introduction to Elementary Particle Physics	Z	2
	easily accessible introduction to elementary particle physics. Development, methods, goals and perspectives of the subject a		
11UFPLN	Introduction to Solid State Physics	ZK	2
	ure is to introduce the undergraduate students to the study of the solid state physics.	Z,ZK	3
17UINZ	Introduction to Engineering	· · ·	-
	o an introduction to the engineering profession. Students will gradually learn the characteristics and specialties of engineering ngineering disciplines, such as the basics of materials science, manufacturing technology, quality control and assurance and		
	Reamp;D activities organization and on selected parts of technical drawings and the work with AutoCAD code.	ecology. I dittier,	the course will
02UKP	Introduction to Curves and Surfaces	Z	2
	s an introduction to the differential geometry of simple manifolds - curves and two-dimensional surfaces. The basic concepts	- 1	
-	plained. In the surface theory we introduce first and second fundamental forms and mean and Gaussian curvature. Essential p		
calculated by students			
12ULT	Introduction to Laser Technique	Z,ZK	3
-	netic radiation sources; laser principle; classification of lasers; characterization and rough application of various types of lase	,	-
12UMF	Introduction to Modern Physics	7	3
	o be a concise introduction to modern / nonclassical physics for students who have already had basic classical physics course	e. A part of the co	-
in a computational labor			-
18UOA	Introduction into Object Oriented Architecture	Z,ZK	4
01UTIZ	Introduction to Theoretical Informatics	ZK	2
11UVOD	Introduction to Specialization	Z	2
	ure is to introduce the undergraduate students to the physical master degree study programmes.	2	2
12VAK	Vacuum Physics and Technology	KZ	4
	concepts and relations; flow of rarefied gas. Interaction of gas with surface of solid surface; sorption, desorption; evaporation,	I	
-	cuum generation. Pumping process. Pumps. Vacuum measurements: vacuum gauges of total and partial pressure; pumping s	-	
-	erials and vacuum instalation parts. Practical exercises.		,,
12PYTH	Scientific Programming in Python	Z	2
	to learn the fundamentals of the modern Python programming language with a focus on scientific computing. Emphasis is pl	- 1	
problems. The course is	performed in an interactive form of practical exercises, whose topics can be tailored to the content of other subjects or stude	ent theses. Studen	its are also
involved in ongoing rese	arch. In the introductory part of the course, students learn the basic features of Python? from basic types to object oriented c	or functional progra	amming. The
greater part of the cours	e focuses on specific features of Python for scientific programming. Presented are the main numerical libraries NumPy, SciP		
library We show how to		y and the Matplot	lib graphics
	generate efficient code, how to combine Python with other languages, what tools are available.	y and the Matplot	lib graphics
12VTV	Scientific and Technical Computing	Z	2
12VTV The students get familia	Scientific and Technical Computing r with methods of solving of computational problems in the scientific and technical practice, and with methods of their progra	Z	2
12VTV The students get familia mainly to programming	Scientific and Technical Computing r with methods of solving of computational problems in the scientific and technical practice, and with methods of their progra n the Fortran language.	Z mming. The cours	2 e is oriented
12VTV The students get familia mainly to programming 12VFT	Scientific and Technical Computing r with methods of solving of computational problems in the scientific and technical practice, and with methods of their progra n the Fortran language. High Frequency and Impulse Circuitry	Z mming. The cours Z,ZK	2 e is oriented 2
12VTV The students get familia mainly to programming 12VFT The goals of course is to	Scientific and Technical Computing r with methods of solving of computational problems in the scientific and technical practice, and with methods of their progra n the Fortran language. High Frequency and Impulse Circuitry o collect advanced knowledge in high frequency technics and high speed events. The course is focused on Maxwell equation	Z mming. The cours Z,ZK	2 e is oriented 2
12VTV The students get familia mainly to programming 12VFT The goals of course is to frequency technics, mic	Scientific and Technical Computing r with methods of solving of computational problems in the scientific and technical practice, and with methods of their progra n the Fortran language. High Frequency and Impulse Circuitry o collect advanced knowledge in high frequency technics and high speed events. The course is focused on Maxwell equation rowaves guidelines, striplines, oscillators, amplifiers and pulse generators.	Z mming. The cours Z,ZK solution, Gunn's	2 te is oriented 2 diodes, high
12VTV The students get familia mainly to programming 12VFT The goals of course is to frequency technics, mic 17VYR	Scientific and Technical Computing r with methods of solving of computational problems in the scientific and technical practice, and with methods of their progra n the Fortran language. High Frequency and Impulse Circuitry o collect advanced knowledge in high frequency technics and high speed events. The course is focused on Maxwell equation rowaves guidelines, striplines, oscillators, amplifiers and pulse generators. Research Reactors	Z mming. The cours Z,ZK solution, Gunn's ZK	2 te is oriented diodes, high 2
12VTV The students get familia mainly to programming 12VFT The goals of course is to frequency technics, mic 17VYR Course is devoted to res	Scientific and Technical Computing r with methods of solving of computational problems in the scientific and technical practice, and with methods of their progra n the Fortran language. High Frequency and Impulse Circuitry o collect advanced knowledge in high frequency technics and high speed events. The course is focused on Maxwell equation rowaves guidelines, striplines, oscillators, amplifiers and pulse generators. Research Reactors earch reactors and their applications for the need of research and industry. Students get familiar with research reactor types a	Z mming. The cours Z,ZK solution, Gunn's ZK and their experime	2 te is oriented diodes, high 2
12VTV The students get familia mainly to programming 12VFT The goals of course is to frequency technics, mic 17VYR Course is devoted to res along with experimental	Scientific and Technical Computing         r with methods of solving of computational problems in the scientific and technical practice, and with methods of their progra         n the Fortran language.         High Frequency and Impulse Circuitry         o collect advanced knowledge in high frequency technics and high speed events. The course is focused on Maxwell equation         rowaves guidelines, striplines, oscillators, amplifiers and pulse generators.         Research Reactors         earch reactors and their applications for the need of research and industry. Students get familiar with research reactor types a         equipment needed for particular applications and their specifics. The course is supported by technical visit to research reactor	Z mming. The cours Z,ZK solution, Gunn's ZK and their experime or workplace.	2 e is oriented 2 diodes, high 2 ental programme
12VTV The students get familia mainly to programming 12VFT The goals of course is to frequency technics, mic 17VYR Course is devoted to res along with experimental 12EPR1	Scientific and Technical Computing         r with methods of solving of computational problems in the scientific and technical practice, and with methods of their progran         n the Fortran language.         High Frequency and Impulse Circuitry         o collect advanced knowledge in high frequency technics and high speed events. The course is focused on Maxwell equation         rowaves guidelines, striplines, oscillators, amplifiers and pulse generators.         Research Reactors         earch reactors and their applications for the need of research and industry. Students get familiar with research reactor types a         equipment needed for particular applications and their specifics. The course is supported by technical visit to research react         Basic Electronics Practicum 1	Z mming. The cours Z,ZK solution, Gunn's ZK and their experime or workplace. KZ	2 ee is oriented 2 diodes, high 2 ental programme 3
12VTV The students get familia mainly to programming 12VFT The goals of course is to frequency technics, mic 17VYR Course is devoted to res along with experimental 12EPR1 The aim of the practicur	Scientific and Technical Computing         r with methods of solving of computational problems in the scientific and technical practice, and with methods of their programent in the Fortran language.         High Frequency and Impulse Circuitry         o collect advanced knowledge in high frequency technics and high speed events. The course is focused on Maxwell equation rowaves guidelines, striplines, oscillators, amplifiers and pulse generators.         Research Reactors         earch reactors and their applications for the need of research and industry. Students get familiar with research reactor types are equipment needed for particular applications and their specifics. The course is supported by technical visit to research react         Basic Electronics Practicum 1         n is 1) to acquire basics skills in electronics and 2) to learn independent problem solving, formulation of a task and formulation	Z mming. The cours Z,ZK solution, Gunn's ZK and their experime or workplace. KZ	2 ee is oriented 2 diodes, high 2 ental programme 3
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16ZDOZ2 Fundamentals of Radiation Dosimetry 2	ZK	2
Fundamentals of biological effects of ionizing radiation. Quantities and units used in radiation protection. Recommendations of ICRP and ICRU. Pri	nciples and methods o	f measurements
in dosimetry. Determination of activity and neutron source emission. Measurements of absorbed dose and exposure.		
16ZDOZ1 Fundamentals of Radiation Dosimetry 1	Z,ZK	4
History, development, and objectives of dosimetry. Quantities and units used for description of sources, fields, interactions of ionizing radiation, i	onizations, energy tra	nsfer and
absorption. Fundamentals of the effects of ionizing radiation.		
17ZEH Basics of Economic Assessment	ZK	2
The course focuses on the economic evaluation of Nuclear power plants. Introductory lectures are concerned with an introduction to economy a	nd the basic compone	ent parts of
microeconomics. Lectures continued with insight into the business and managerial economics, explanation of the concepts of incomes, expenses	, etc. and their applica	tions in electrical
energy resources evaluation. Second part of lectures is focused on evaluation of nuclear power plants - the fuel cycle and operations of NPP.		
17ZEL Basics of Electronics	KZ	3
Lectures provide basic information of electronics. In the beginning, lectures are devoted to passive components - resistors, capacitors, inductors		
them. Next, lectures deal with semiconductor components (standard, Zener, capacitive, LED), bipolar, unipolar transistors and semiconductor components	•	
and triacs). Lectures continue with general amplifiers and operational amplifiers. Finally, lectures deal with digital circuits, digital/analog and ana	og/digital converters.	Lectures are
completed with electronic laboratory exercises.		
12ZEL1   Basic Electronics 1	Z,ZK	3
The subject provides primary knowledge of circuit theory concerning principles of electronic circuits in both stationary and harmonic stable state		
circuits include symbolic and complex method are explained. Proper circuit analysis is also lectured. The subject's final part deals with transient		
12ZEL2 Basic Electronics 2	Z,ZK	3
The subject follows up with the Basic Electronics 1. Semiconductor elements basic properties are explained. Thecourse's final part deals with ba	-	
02ZFM1 Foundations of Physical Measurements 1	Z	2
The lecture is designed for students of physical specializations (Experimental particle physics, Physical engineering, Nuclear engineering), howe		
other branches. The goal of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquire	ed data on a PC. Stud	entslearn the
basic habits of work in a physics lab.		
02ZFM2 Foundations of Physical Measurements 2	Z	2
This introductory course is devoted to the essentials of measurements of the most important physical quantities. It is especially recommended to		
one of the physicas curricula - Physical engineering and Nuclear engineering. Also the methods of evaluation of statistical data using PC and pra	ctical work with meas	urement devices
is involved. Students learn main rules connected with experimental work in physical laboratory.		
11ZFPL Basic to Solid State Physics	KZ	2
Description of fundamental properties of solids following the regular long distance ordering of atoms in a crystal lattice. Based on the introduced	-	
solids, various types of crystals and their properties are defined. The model of crystalline lattice dynamics in harmonic approximation is described a		
are derived. The periodic potential of the crystal lattice is introduced and its relation to the following model describing the energetic state of elect energy bands explained. The special consequences of band approach to the physical properties of solids are elucidated. The aim of the course		
interpret a broad phenomenological basis of physical properties of crystalline solids	is to systematically in	
	Z,ZK	4
12ZFP Principles of Plasma Physics Basic physics of high temperature plasmas is explained using particle, kinetic and fluid approaches. It includes drift motions and adiabatic invaria		-
and propagation of electromagnetic waves in inhomogeneous plasmas. Basic non-linear effects, such as ponderomotive force, self-focusing and	-	
It comprises brief introduction into magnetohydrodynamics and nuclear fusion. Basics of atomic physics od multiply-ionized plasmas are introdu	-	ie are explained
02ZJF Nuclear Physics	Z,ZK	6
This scientific field presents formidable challenges both experimentally and theoretically, simply because we are dealing with the submicroscopi	1 '	-
intuition regarding the behaviour of objects fails us. The lecture is a basic introduction to very interesting regions of subatomic physics.	,	
02ZJFB Nuclear Physics B	KZ	3
This scientific field presents formidable challenges both experimentally and theoretically, simply because we are dealing with the submicroscopi		
intuition regarding the behaviour of objects fails us. The lecture is a basic introduction to very interesting regions of subatomic physics.	,	
15ZKJE Nuclear Power Plants Design and Operation	ZK	3
Target of lecture is to create basic knowledge of physics of nuclear reactors utilizing fission. Further explains arrangement of nuclear fuel, purpose, t	1	
of core. Function and construction of all components are defined wit regard to nuclear physics, physics of shielding, theory of regulation, materia	-	
dosimetry. Creates knowledge for evaluation of nuclear safety and radiation protection in nuclear energy, reliability and economy for comparison		
environment and to strategic importancy of nuclear sources of energy. Gives basic knowledge of construction, operation and decommissioning of	nuclear power station	ns. Informs about
high level nuclear waste and spent fuel and their management.		
16MEZB Fundamentals of Ionizing-Radiation Metrology	Z,ZK	4
The course summarizes the basic objectives and content of ionizing radiation metrology. It deals with the interpretation of radiation quantities an	d units in metrology. It	summarizes the
theoretical and experimental foundations of metrology, the determination of basic parameters of radiation. Lectures are supplemented with basic	summary of relevant	legislation and
regulations.		
01ZOS Introduction to Operating Systems	Z	2
Introduction to structure of operating systems. Processes, thread, memory management. Synchronization of multi=threaded applications. Memory		
12ZAOP Fundamentals of Optics	ry mapped files.	
	ry mapped files.	2
The lecture covers the very basics of optics - electromagnetic theory, linear optical physics and material effects, basics of nonlinear effects, and	Z,ZK	
	Z,ZK geometrical optics. Th	he main goal of
The lecture covers the very basics of optics - electromagnetic theory, linear optical physics and material effects, basics of nonlinear effects, and the lecture is to obtain, on the bachelor level, broad and general information on optics, giving an essential orientation in the field, especially with work. Particular topics are further elaborated during departmental masters program. The lecture stems from the electrodynamic notion of plane w	Z,ZK geometrical optics. Th respect to character aves in vacuum (inclu	he main goal of of the bachelor ding polarization
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16ZRAO	Basics of Radiation Protection	Z	2
The aim of the course is	to familiarize students with the general principles of radiation protection. The main emphasis is put on basic mechanisms and	l concepts, in orde	r to allow critical
orientation in this field.	The course provides answers to the cardinal questions: What is ionizing radiation (IR), where it comes from, whether and how	v it is dangerous f	or people, what
is the meaning of prote	ctive units (Gray, Sievert), how to prevent malicious effect of IR and many others. The content of the lectures does not require	any prior knowle	dge.
02ZSM	Introduction to the Standard Model	ZK	2
Particles, leptons, hadro	ons, baryons, mesons, symmetry, symmetry group, quarks, gluons, partons, standard model of electroweak and strong intera	ctions, quantum c	hromodynamics
(QCD), cross section, s	cattering cross section.		
16ZEDB	Basics of Experimantal Data Processing	ZK	2
Statistical analysis of ex	perimental data; univariate data; calibration; regression; multivariate data.		
12ZDP	Data Processing for Publishing	Z	2
Typography, computer of	omputer-assisted publishing, coding of text, OCR (optical code recognition), DTP (desk top publishing), programming langua	ages for typesettin	ıg (TeX, LaTeX,
HTML, XML,, publishi	ng into www pages, cloud computing, commonly used graphical formats, formatting of typical data (PDF, PS, DOC, DOCX, PI	PS, PPSX, RFT, X	(LS, XLSX),
multimedial presentatio	ns, multimedial formats.		
12ZMD	Measurement and Data Processing	KZ	2
Basic knowledge for the	measurements and data processing and result interpretation: errors, precision, accuracy, normal distribution and its propetio	es, data fitting, se	paration of the
signal from the noise.			

# List of courses of this pass:

Code	Name of the course	Completion	Credite
00EKOT	Economy in Technology	Z	1
I	The course introduces the basics of micro- and macroeconomics.	1	
00ETV	Ethics of Science and Technology	Z	1
00MAM1	Essentials of High School Course 1	Z	1
00MAM2	Essentials of High School Math Course 2	Z	1
1	Review of basics of high school mathematics.	-	-
00PT	Preparatory Week	Z	2
00RET	Rhetoric	Z	1
	on the acquisition of speech and voice techniques and on the rules of correct pronounciation. The course is also devoted to the	1	lic speech
as well as to its non	verbal aspects. Stylistics exercises, strategies for coping with stage-fright and a short excursion into the history of rhetoric are an	integral part of the	e course.
00UPRA	Introduction to Law	Z	1
00UPSY	Introduction to Psychology	Z	1
01ALG	Algebra	ZK	4
After an introduction int	o the set theory standard algebraic structures are dealt with: groups, rings, fields, modules, linear algebras, lattices, Boolean alge	1	iomials ov
	commutative fields.		
01ALGE	Algebra	Z,ZK	6
Firstly, the Peano axion	ns are treated in detail. Elements of the set theory cover only: equivalence and subvalence, the Cantorov-Bernstein theorem, the a	axiom of choice an	d equivale
statements, definition	of ordinals and cardinals. Further standard algebraic structures are addressed: semigroups, monoids, groups, rings, integral dom	nains, principal idea	al domain
	fields, lattices. Independent chapters are devoted to divisibility in integral domains and to finite fields.		
01DEM	History of Mathematics	Z	1
The subject has the for	m of regular seminars where the members of the department of mathematics, but also invited speakers - specialists in the field - g	ive their talks on va	roius topi
	from the history of mathematics.		
01DIFR	Differential Equations	Z,ZK	4
The course contains in	roduction in the solution of ordinary differential equations. It contains a survey of equation types solvable analytically, basics of the	he existence theory	, solution
	linear types of equations and introduction in the theory of boundary-value problems.	-	
01DIM1	linear types of equations and introduction in the theory of boundary-value problems. Discrete Mathematics 1	Z	2
01DIM1		I	2
01DIM1 01DIM2	Discrete Mathematics 1	Z	2
	Discrete Mathematics 1 The seminar is devoted to elementary number theory and applications. It includes individual problem solving.	I	
	Discrete Mathematics 1 The seminar is devoted to elementary number theory and applications. It includes individual problem solving. Discrete Mathematics 2	I	
01DIM2	Discrete Mathematics 1 The seminar is devoted to elementary number theory and applications. It includes individual problem solving. Discrete Mathematics 2 The seminar is devoted to recurrence relations. It includes individual problem solving.	Z	2
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01DIM2	Discrete Mathematics 1 The seminar is devoted to elementary number theory and applications. It includes individual problem solving. Discrete Mathematics 2 The seminar is devoted to recurrence relations. It includes individual problem solving. Discrete Mathematics 3 to elementary proofs of non-trivial combinatoriwal identities and to generating functions and their applications. In the seminar sta	Z	2
01DIM2 01DIM3 The subject is devoted 01DYK	Discrete Mathematics 1 The seminar is devoted to elementary number theory and applications. It includes individual problem solving. Discrete Mathematics 2 The seminar is devoted to recurrence relations. It includes individual problem solving. Discrete Mathematics 3 to elementary proofs of non-trivial combinatoriwal identities and to generating functions and their applications. In the seminar stu- solution chosen from the given literature.	Z	2 2 roblem wi 2
01DIM2 01DIM3 The subject is devoted 01DYK This course is an int calculus, differential fo	Discrete Mathematics 1 The seminar is devoted to elementary number theory and applications. It includes individual problem solving. Discrete Mathematics 2 The seminar is devoted to recurrence relations. It includes individual problem solving. Discrete Mathematics 3 to elementary proofs of non-trivial combinatoriwal identities and to generating functions and their applications. In the seminar states solution chosen from the given literature. Introduction to Continuum Dynamics roduction to the mathematical description of continuum dynamics. It summarizes the necessary mathematical apparatus with em rms, and integration on manifolds. It includes the basic concepts of continuum mechanics such as strain and stress tensors or su	Z Z udents present a p Z phasis on vector a ubstantial derivative	2 roblem wi 2 nd tensor e, by mear
01DIM2 01DIM3 The subject is devoted 01DYK This course is an int calculus, differential fo	Discrete Mathematics 1 The seminar is devoted to elementary number theory and applications. It includes individual problem solving. Discrete Mathematics 2 The seminar is devoted to recurrence relations. It includes individual problem solving. Discrete Mathematics 3 to elementary proofs of non-trivial combinatoriwal identities and to generating functions and their applications. In the seminar states solution chosen from the given literature. Introduction to Continuum Dynamics roduction to the mathematical description of continuum dynamics. It summarizes the necessary mathematical apparatus with em rms, and integration on manifolds. It includes the basic concepts of continuum mechanics such as strain and stress tensors or su of derive the fundamental laws of conservation of mass, momentum, angular momentum, and energy in integral and differential forr	Z Z udents present a p Z phasis on vector a ubstantial derivative	2 roblem wi 2 nd tensor e, by mear
01DIM2 01DIM3 The subject is devoted 01DYK This course is an int calculus, differential fo of which it is possible to	Discrete Mathematics 1 The seminar is devoted to elementary number theory and applications. It includes individual problem solving. Discrete Mathematics 2 The seminar is devoted to recurrence relations. It includes individual problem solving. Discrete Mathematics 3 to elementary proofs of non-trivial combinatoriwal identities and to generating functions and their applications. In the seminar str solution chosen from the given literature. Introduction to Continuum Dynamics roduction to the mathematical description of continuum dynamics. It summarizes the necessary mathematical apparatus with em rms, and integration on manifolds. It includes the basic concepts of continuum mechanics such as strain and stress tensors or su of erive the fundamental laws of conservation of mass, momentum, angular momentum, and energy in integral and differential forr these conservation laws are adapted to the case of viscous and inviscid fluid and linear and nonlinear elastic body.	Z Z Udents present a p Z phasis on vector a Ibstantial derivative n. In the last part of	2 roblem wi 2 nd tensor b, by mear the cours
01DIM2 01DIM3 The subject is devoted 01DYK This course is an int calculus, differential fo of which it is possible to 01DYSY	Discrete Mathematics 1 The seminar is devoted to elementary number theory and applications. It includes individual problem solving. Discrete Mathematics 2 The seminar is devoted to recurrence relations. It includes individual problem solving. Discrete Mathematics 3 to elementary proofs of non-trivial combinatoriwal identities and to generating functions and their applications. In the seminar str solution chosen from the given literature. Introduction to Continuum Dynamics roduction to the mathematical description of continuum dynamics. It summarizes the necessary mathematical apparatus with em rms, and integration on manifolds. It includes the basic concepts of continuum mechanics such as strain and stress tensors or su of erive the fundamental laws of conservation of mass, momentum, angular momentum, and energy in integral and differential forr these conservation laws are adapted to the case of viscous and inviscid fluid and linear and nonlinear elastic body. Theory of Dynamic Systems	Z Z udents present a p Z phasis on vector a ubstantial derivative n. In the last part of ZK	2 roblem wi 2 nd tensor a, by mear the cours 3
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01DIM2 01DIM3 The subject is devoted 01DYK This course is an int calculus, differential fo of which it is possible to 01DYSY The course provides a up the understanding	Discrete Mathematics 1 The seminar is devoted to elementary number theory and applications. It includes individual problem solving. Discrete Mathematics 2 The seminar is devoted to recurrence relations. It includes individual problem solving. Discrete Mathematics 3 to elementary proofs of non-trivial combinatoriwal identities and to generating functions and their applications. In the seminar str solution chosen from the given literature. Introduction to Continuum Dynamics roduction to the mathematical description of continuum dynamics. It summarizes the necessary mathematical apparatus with em rms, and integration on manifolds. It includes the basic concepts of continuum mechanics such as strain and stress tensors or su of derive the fundamental laws of conservation of mass, momentum, angular momentum, and energy in integral and differential forr these conservation laws are adapted to the case of viscous and inviscid fluid and linear and nonlinear elastic body. Theory of Dynamic Systems n introduction to system theory with emphasis on control theory and understanding of the fundamental concepts of systems and of the dynamical behavior of systems as well as provide the necessary mathematical background. Internal and external system	Z Z udents present a p Z phasis on vector a ubstantial derivative n. In the last part of ZK control theory. First descriptions are de	2 roblem wi 2 nd tensor 5 by mean the cours 5 t, we buil sscribed in
01DIM2 01DIM3 The subject is devoted 01DYK This course is an int calculus, differential fo of which it is possible to 01DYSY The course provides a up the understanding detail, including state	Discrete Mathematics 1 The seminar is devoted to elementary number theory and applications. It includes individual problem solving. Discrete Mathematics 2 The seminar is devoted to recurrence relations. It includes individual problem solving. Discrete Mathematics 3 to elementary proofs of non-trivial combinatoriwal identities and to generating functions and their applications. In the seminar str solution chosen from the given literature. Introduction to Continuum Dynamics roduction to the mathematical description of continuum dynamics. It summarizes the necessary mathematical apparatus with em rms, and integration on manifolds. It includes the basic concepts of continuum mechanics such as strain and stress tensors or su of derive the fundamental laws of conservation of mass, momentum, angular momentum, and energy in integral and differential forr these conservation laws are adapted to the case of viscous and inviscid fluid and linear and nonlinear elastic body. Theory of Dynamic Systems n introduction to system theory with emphasis on control theory and understanding of the fundamental concepts of systems and of the dynamical behavior of systems as well as provide the necessary mathematical background. Internal and external system variable, impulse response and transfer function, polynomial matrix, and fractional representations. Stability, controllability, obse	Z Z Udents present a p Z phasis on vector a ibstantial derivative n. In the last part of ZK control theory. First descriptions are derivability, and realiz	2 roblem wi and tensor by mean the cours the cours st, we bui escribed in ations are
01DIM2 01DIM3 The subject is devoted 01DYK This course is an int calculus, differential fo of which it is possible to 01DYSY The course provides a up the understanding detail, including state explained with the empl	Discrete Mathematics 1 The seminar is devoted to elementary number theory and applications. It includes individual problem solving. Discrete Mathematics 2 The seminar is devoted to recurrence relations. It includes individual problem solving. Discrete Mathematics 3 to elementary proofs of non-trivial combinatoriwal identities and to generating functions and their applications. In the seminar str solution chosen from the given literature. Introduction to Continuum Dynamics roduction to the mathematical description of continuum dynamics. It summarizes the necessary mathematical apparatus with em rms, and integration on manifolds. It includes the basic concepts of continuum mechanics such as strain and stress tensors or su of derive the fundamental laws of conservation of mass, momentum, angular momentum, and energy in integral and differential forr these conservation laws are adapted to the case of viscous and inviscid fluid and linear and nonlinear elastic body. Theory of Dynamic Systems n introduction to system theory with emphasis on control theory and understanding of the fundamental concepts of systems and of the dynamical behavior of systems as well as provide the necessary mathematical background. Internal and external system	Z Z Udents present a p Z phasis on vector a Ibstantial derivative n. In the last part of C C C C C C C C C C C C C C C C C C C	2 roblem wi 2 nd tensor by mear the cours st, we bui escribed in ations are k controlle

01FA1			
	Functional Analysis 1	Z,ZK	3
Continuing course of	mathematical analysis and algebra introduction to the basics of functional analysis. There are the concepts that students need to u	nderstand the va	rious physica
04540	and technical disciplines.	7 71/	
01FA2	Functional Analysis 2 o present selected fundamental results from functional analysis including basic theorems of the theory of Banach spaces, closed or	Z,ZK	4
The course aims to	Hilbert-Schmidt operators, spectral decomposition of bounded self-adjoint operators.		r spectrum,
01FAN1	Functional Analysis 1	Z,ZK	4
-	nd results are addressed concerning successively topological spaces, metric spaces, topological vector spaces, normed and Banac	,	1 -
01FKP	Functions of Complex Variable	ZK	2
	advanced properties of systems of holomorphic functions, Ascoli-Vitali's theorem, advanced properties of conformal mappings, trai		
	stions. Basic properties of complex functions of several complex variables together with improper line integrals and its applications a		moromorph
01FKPB	Functions of Complex Variable B	Z	2
I	advanced properties of systems of holomorphic functions, Ascoli-Vitali's theorem, advanced properties of conformal mappings, trai		1
	tions. Basic properties of complex functions of several complex variables together with improper line integrals and its applications a		
01GTDR	Geometric Theory of Ordinary Differential Equations	Z	2
The seminar consists	s of the qualitative theory of ODEs dealing with the geometric and topological properties of the solution. In this context, we mention su	itably formulated	d basic resul
of	the existence and uniqueness, continuous dependence on parameters and initial conditions. Main part is devoted to the autonomous	us systems.	
01JEPR	Simple Compilers	Z	2
•	Lexical and syntax analysis, code generation, simple optimizations, development environments, reflection.		
01LA1	Linear Algebra 1	Z	1
· · · · · ·	The subject summarizes the most important notions and theorems related to the study of vector spaces.		
01LAA2	Linear Algebra A2	Z,ZK	6
The subject is de	voted to the theory of linear operators on vector spaces (mainly equipped with scalar product). In the same time we introduce the co	prresponding ma	trix theory.
01LAB2	Linear Algebra B2	Z,ZK	4
The subject sum	marizes the most important notions and theorems related to the matrix theory, to the study of vector spaces with a scalar product a	nd to the linear g	geometry.
01LAL	Linear Algebra 1	Z	2
1. Vector space. 2. I	Linear dependence and independence. 3. Basis and dimension. 4. Subspaces of vector spaces. 5. Linear mappings. 6. Matrices of li	near mappings.	7. Frobenius
	theorem.		
01LALA	Linear Algebra A 1, Examination	ZK	5
01LALB	Linear Algebra B 1, Examination	ZK	3
01LAP	Linear Algebra Plus	Z,ZK	5
•	The subject summarizes the most important notions and theorems related to the study of vector spaces.		•
01LAZ	Linear Algebra 1, Examination		_
		ZK	2
	The content of this subject is the exam in Linear Algebra 1.	ZK	2
01LIP		ZK Z,ZK	2
01LIP	The content of this subject is the exam in Linear Algebra 1.	Z,ZK	3
01LIP	The content of this subject is the exam in Linear Algebra 1. Linear Programming blems about constrained extremum problems for multivariable functions (the function is linear and the constraint equations are given inequalities).	Z,ZK	3
01LIP	The content of this subject is the exam in Linear Algebra 1. Linear Programming blems about constrained extremum problems for multivariable functions (the function is linear and the constraint equations are given	Z,ZK	3
01LIP	The content of this subject is the exam in Linear Algebra 1. Linear Programming blems about constrained extremum problems for multivariable functions (the function is linear and the constraint equations are given inequalities).	Z,ZK by linear equation	3
01LIP	The content of this subject is the exam in Linear Algebra 1. Linear Programming blems about constrained extremum problems for multivariable functions (the function is linear and the constraint equations are given inequalities). Linear Algebra 1	Z,ZK by linear equation	3
01LIP	The content of this subject is the exam in Linear Algebra 1. Linear Programming blems about constrained extremum problems for multivariable functions (the function is linear and the constraint equations are given inequalities). Linear Algebra 1 The subject summarizes the most important notions and theorems related to the study of vector spaces.	Z,ZK by linear equation Z Z	3 ons and line 2
01LIP	The content of this subject is the exam in Linear Algebra 1. Linear Programming blems about constrained extremum problems for multivariable functions (the function is linear and the constraint equations are given inequalities). Linear Algebra 1 The subject summarizes the most important notions and theorems related to the study of vector spaces. Calculus 1	Z,ZK by linear equation Z	3 ons and line 2
01LIP Ve study special pro 01LNA1 01MA1 01MAA2 The sub	The content of this subject is the exam in Linear Algebra 1. Linear Programming blems about constrained extremum problems for multivariable functions (the function is linear and the constraint equations are given inequalities). Linear Algebra 1 The subject summarizes the most important notions and theorems related to the study of vector spaces. Calculus 1 Basic course of real analysis (functions of one real variable, differential calculus).	Z,ZK by linear equation Z Z Z,ZK	3 ons and line 2 4 10
01LIP Ve study special pro 01LNA1 01MA1 01MAA2	The content of this subject is the exam in Linear Algebra 1. Linear Programming blems about constrained extremum problems for multivariable functions (the function is linear and the constraint equations are given inequalities). Linear Algebra 1 The subject summarizes the most important notions and theorems related to the study of vector spaces. Calculus 1 Basic course of real analysis (functions of one real variable, differential calculus). Calculus A2	Z,ZK by linear equation Z Z Z,ZK	3 ons and line 2 4 10
01LIP Ve study special pro 01LNA1 01MA1 01MAA2 The sub 01MAA3	The content of this subject is the exam in Linear Algebra 1. Linear Programming blems about constrained extremum problems for multivariable functions (the function is linear and the constraint equations are given inequalities). Linear Algebra 1 The subject summarizes the most important notions and theorems related to the study of vector spaces. Calculus 1 Basic course of real analysis (functions of one real variable, differential calculus). Calculus A2 ject is devoted mainly to the integral calculus of the real functions with one real variable and to the theory of the number series and	Z,ZK by linear equation Z Z Z,ZK the power series Z,ZK	3 3 3 3 4 4 10 5.
01LIP Ve study special pro 01LNA1 01MA1 01MAA2 The sub	The content of this subject is the exam in Linear Algebra 1. Linear Programming blems about constrained extremum problems for multivariable functions (the function is linear and the constraint equations are given inequalities). Linear Algebra 1 The subject summarizes the most important notions and theorems related to the study of vector spaces. Calculus 1 Basic course of real analysis (functions of one real variable, differential calculus). Calculus A2 ject is devoted mainly to the integral calculus of the real functions with one real variable and to the theory of the number series and Calculus A3	Z,ZK by linear equation Z Z Z,ZK the power series	3 pons and line 2 4 10 s.
01LIP Ve study special pro 01LNA1 01MA1 01MAA2 The sub 01MAA3 01MAA4	The content of this subject is the exam in Linear Algebra 1. Linear Programming blems about constrained extremum problems for multivariable functions (the function is linear and the constraint equations are given inequalities). Linear Algebra 1 The subject summarizes the most important notions and theorems related to the study of vector spaces. Calculus 1 Basic course of real analysis (functions of one real variable, differential calculus). Calculus A2 ject is devoted mainly to the integral calculus of the real functions with one real variable and to the theory of the number series and Calculus A3 Function sequences and series, foundation of topology, and differential calculus of several variables. Calculus A4 ntegration of functions of several variables, measure theory, foundation of differential and integral calculus on manifolds and complete	Z,ZK by linear equation Z Z,ZK the power series Z,ZK Z,ZK x analysis.	3 ons and line 2 4 4 10 10
01LIP Ve study special pro 01LNA1 01MA1 01MAA2 The sub 01MAA3 01MAA4	The content of this subject is the exam in Linear Algebra 1. Linear Programming blems about constrained extremum problems for multivariable functions (the function is linear and the constraint equations are given inequalities). Linear Algebra 1 The subject summarizes the most important notions and theorems related to the study of vector spaces. Calculus 1 Basic course of real analysis (functions of one real variable, differential calculus). Calculus A2 ject is devoted mainly to the integral calculus of the real functions with one real variable and to the theory of the number series and Calculus A3 Function sequences and series, foundation of topology, and differential calculus of several variables. Calculus A4 ntegration of functions of several variables, measure theory, foundation of differential and integral calculus on manifolds and comple Calculus B2	Z,ZK by linear equation Z Z,ZK the power series Z,ZK Z,ZK	3 ons and line 2 4 4
01LIP Ve study special pro 01LNA1 01MA1 01MAA2 The sub 01MAA3 01MAA4	The content of this subject is the exam in Linear Algebra 1. Linear Programming blems about constrained extremum problems for multivariable functions (the function is linear and the constraint equations are given inequalities). Linear Algebra 1 The subject summarizes the most important notions and theorems related to the study of vector spaces. Calculus 1 Basic course of real analysis (functions of one real variable, differential calculus). Calculus A2 ject is devoted mainly to the integral calculus of the real functions with one real variable and to the theory of the number series and Calculus A3 Function sequences and series, foundation of topology, and differential calculus of several variables. Calculus A4 ntegration of functions of several variables, measure theory, foundation of differential and integral calculus on manifolds and complete	Z,ZK by linear equation Z Z,ZK the power series Z,ZK Z,ZK x analysis.	3 ons and line 2 4 4 10 10
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01LIP Ve study special pro 01LNA1 01MA1 01MAA2 The sub 01MAA3 01MAA4	The content of this subject is the exam in Linear Algebra 1. Linear Programming blems about constrained extremum problems for multivariable functions (the function is linear and the constraint equations are given inequalities). Linear Algebra 1 The subject summarizes the most important notions and theorems related to the study of vector spaces. Calculus 1 Basic course of real analysis (functions of one real variable, differential calculus). Calculus A2 ject is devoted mainly to the integral calculus of the real functions with one real variable and to the theory of the number series and Calculus A3 Function sequences and series, foundation of topology, and differential calculus of several variables. Calculus A4 ntegration of functions of several variables, measure theory, foundation of differential and integral calculus on manifolds and comple Calculus B2 Basic calculus (real analysis, indefinite and definite integrals and series). Calculus B3 d to functional sequences and series, theory of ordinary differential equations, theory of quadratic forms and surfaces, and general th	Z,ZK by linear equation Z Z,ZK the power series Z,ZK z,ZK z,ZK Z,ZK Z,ZK	3       2       4       4       10       10       10       7       7
01LIP Ve study special pro 01LNA1 01MA1 01MAA2 The sub 01MAA3 01MAA3 01MAB2	The content of this subject is the exam in Linear Algebra 1. Linear Programming blems about constrained extremum problems for multivariable functions (the function is linear and the constraint equations are given inequalities). Linear Algebra 1 The subject summarizes the most important notions and theorems related to the study of vector spaces. Calculus 1 Basic course of real analysis (functions of one real variable, differential calculus). Calculus A2 ject is devoted mainly to the integral calculus of the real functions with one real variable and to the theory of the number series and Calculus A3 Function sequences and series, foundation of topology, and differential calculus of several variables. Calculus A4 ntegration of functions of several variables, measure theory, foundation of differential and integral calculus on manifolds and comple Calculus B2 Basic calculus (real analysis, indefinite and definite integrals and series). Calculus B3 d to functional sequences and series, theory of ordinary differential equations, theory of quadratic forms and surfaces, and general th and prehilbert?s spaces.	Z,ZK by linear equation Z Z Z,ZK the power series Z,ZK z,ZK z,ZK Z,ZK eory of metric sp	3       2       4       10       10       10       7       7
01LIP Ve study special pro 01LNA1 01MA1 01MAA2 The sub 01MAA3 01MAA3 01MAB2 01MAB3 The course is devote 01MAB4	The content of this subject is the exam in Linear Algebra 1. Linear Programming blems about constrained extremum problems for multivariable functions (the function is linear and the constraint equations are given inequalities). Linear Algebra 1 The subject summarizes the most important notions and theorems related to the study of vector spaces. Calculus 1 Basic course of real analysis (functions of one real variable, differential calculus). Calculus A2 ject is devoted mainly to the integral calculus of the real functions with one real variable and to the theory of the number series and Calculus A3 Function sequences and series, foundation of topology, and differential calculus of several variables. Calculus B2 Basic calculus (real analysis, indefinite and definite integrals and series). Calculus B3 d to functional sequences and series, theory of ordinary differential equations, theory of quadratic forms and surfaces, and general th and prehilbert?s spaces. Calculus B4	Z,ZK by linear equation Z Z Z,ZK the power series Z,ZK z,ZK z,ZK z,ZK eory of metric sp Z,ZK	3       2       4       4       10       10       10       7       7       7       7       7       7       7       7
01LIP Ve study special pro 01LNA1 01MA1 01MAA2 The sub 01MAA3 01MAA3 01MAB4 01MAB4 The course is devote	The content of this subject is the exam in Linear Algebra 1. Linear Programming blems about constrained extremum problems for multivariable functions (the function is linear and the constraint equations are given inequalities). Linear Algebra 1 The subject summarizes the most important notions and theorems related to the study of vector spaces. Calculus 1 Basic course of real analysis (functions of one real variable, differential calculus). Calculus A2 ject is devoted mainly to the integral calculus of the real functions with one real variable and to the theory of the number series and Calculus A3 Function sequences and series, foundation of topology, and differential calculus on manifolds and comple Calculus B2 Basic calculus (real analysis, indefinite and definite integrals and series). Calculus B3 d to functional sequences and series, theory of ordinary differential equations, theory of quadratic forms and surfaces, and general th and prehilbert?s spaces. Calculus B4 oted properties of functions of several variables, differential and integral calculus. Furthermore, the measure theory and theory of L	Z,ZK by linear equation Z Z,ZK the power series Z,ZK Z,ZK z,ZK z,ZK eory of metric sp Z,ZK ebesgue integral	3       2       2       4       10       10       7       7       7       7       7       7       7       7       3       7       7       7       10
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01LIP Ve study special pro 01LNA1 01MA1 01MAA2 The sub 01MAA3 01MAA3 01MAB4 11 01MAB3 he course is devote 01MAB4 The course is dev	The content of this subject is the exam in Linear Algebra 1. Linear Programming iblems about constrained extremum problems for multivariable functions (the function is linear and the constraint equations are given inequalities). Linear Algebra 1 The subject summarizes the most important notions and theorems related to the study of vector spaces. Calculus 1 Basic course of real analysis (functions of one real variable, differential calculus). Calculus A2 ject is devoted mainly to the integral calculus of the real functions with one real variable and to the theory of the number series and Calculus A3 Function sequences and series, foundation of topology, and differential calculus of several variables. Calculus A4 ntegration of functions of several variables, measure theory, foundation of differential and integral calculus on manifolds and comple Calculus B2 Basic calculus (real analysis, indefinite and definite integrals and series). Calculus B3 d to functional sequences and series, theory of ordinary differential equations, theory of quadratic forms and surfaces, and general th and prehilbert?s spaces. Calculus B4 oted properties of functions of several variables, differential and integral calculus. Furthermore, the measure theory and theory of L Calculus 1 Basic calculus (real analysis, functions of one real variable, differential calculus).	Z,ZK by linear equation Z Z Z,ZK the power series Z,ZK z,ZK z,ZK eory of metric sp Z,ZK eory of metric sp Z,ZK ebesgue integrat Z	3       2       4       10       10       7       7       7       7       10       4
01LIP Ve study special pro 01LNA1 01MA1 01MAA2 The sub 01MAA3 01MAA3 01MAB4 01MAB4 The course is devote	The content of this subject is the exam in Linear Algebra 1. Linear Programming blems about constrained extremum problems for multivariable functions (the function is linear and the constraint equations are given inequalities). Linear Algebra 1 The subject summarizes the most important notions and theorems related to the study of vector spaces. Calculus 1 Basic course of real analysis (functions of one real variable, differential calculus). Calculus A2 ject is devoted mainly to the integral calculus of the real functions with one real variable and to the theory of the number series and Calculus A3 Function sequences and series, foundation of differential and integral calculus on manifolds and comple Calculus B2 Basic calculus (real analysis, indefinite and definite integrals and surfaces, and general th and prehilbert?s spaces. Calculus B4 oted properties of functions of several variables, differential and integral calculus. Furthermore, the measure theory and theory of L Calculus A 1, Examination Calculus A 1, Examination	Z,ZK by linear equation Z Z,ZK the power series Z,ZK Z,ZK z,ZK z,ZK eory of metric sp Z,ZK ebesgue integral	3       2       4       10       10       7       7       7       7       7       7       10
01LIP Ve study special pro 01LNA1 01MA1 01MAA2 The sub 01MAA3 01MAA4 01MAB4 1 01MAB3 he course is devote 01MAB4 The course is devote 01MAB4 01MANA	The content of this subject is the exam in Linear Algebra 1. Linear Programming blems about constrained extremum problems for multivariable functions (the function is linear and the constraint equations are given inequalities). Linear Algebra 1 The subject summarizes the most important notions and theorems related to the study of vector spaces. Calculus 1 Basic course of real analysis (functions of one real variable, differential calculus). Calculus A2 ject is devoted mainly to the integral calculus of the real functions with one real variable and to the theory of the number series and Calculus A3 Function sequences and series, foundation of topology, and differential calculus of several variables. Calculus B4 dto functional sequences and series, theory of ordinary differential equations, theory of quadratic forms and surfaces, and general th and prehilbert? spaces. Calculus B4 oted properties of functions of several variables, differential and integral calculus, integral tand integral calculus, integral and unitegral calculus b4. Calculus B4 oted properties of functions of several variables, differential and integral calculus, integral tand integral calculus, integral tand integral calculus (real analysis, functions of one real variable, differential calculus, and general th and prehilbert? spaces. Calculus B4 oted properties of functions of several variables, differential and integral calculus, itervy and theory of L Calculus Calculus Calculus Calculus 1 Basic calculus (real analysis, functions of one real variable, differential calculus). Calculus A 1, Examination Examination of knowledge about stuff lectured in the 01MAN course.	Z,ZK by linear equation Z Z,ZK the power series Z,ZK Z,ZK z,ZK z,ZK eory of metric sp Z,ZK ebesgue integral Z ZK	3       2       4       10       10       7       7       10       10
01LIP Ve study special pro 01LNA1 01MA1 01MAA2 The sub 01MAA3 01MAA3 01MAB4 11 01MAB3 he course is devote 01MAB4 The course is dev	The content of this subject is the exam in Linear Algebra 1. Linear Programming blems about constrained extremum problems for multivariable functions (the function is linear and the constraint equations are given inequalities). Linear Algebra 1 The subject summarizes the most important notions and theorems related to the study of vector spaces. Calculus 1 Basic course of real analysis (functions of one real variable, differential calculus). Calculus A2 ject is devoted mainly to the integral calculus of the real functions with one real variable and to the theory of the number series and Calculus A3 Function sequences and series, foundation of topology, and differential calculus on manifolds and comple Calculus B2 Basic calculus (real analysis, indefinite and definite integrals and series). Calculus B3 d to functional sequences and series, theory of ordinary differential equations, theory of quadratic forms and surfaces, and general th and prehilbert?s spaces. Calculus B4 toted properties of functions of several variables, differential and integral calculus). Calculus A Basic calculus (real analysis, functions, theory of quadratic forms and surfaces, and general th and prehilbert?s spaces. Calculus B4 toted properties of functions of several variables, differential and integral calculus. Calculus B4 Calculus B4 toted properties of functions of several variables, differential and integral calculus. Calculus B4 Calculus B1 Basic calculus (real analysis, functions of one real variable, differential calculus). Calculus B Calculus Calculus Calculus Calculus Calculus Calculus Calculus C	Z,ZK by linear equation Z Z Z,ZK the power series Z,ZK z,ZK z,ZK eory of metric sp Z,ZK eory of metric sp Z,ZK ebesgue integrat Z	3       2       4       10       10       7       7       7       7       7       10       4
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01LIP Ve study special pro 01LNA1 01MA1 01MAA2 The sub 01MAA3 01MAA3 01MAB2 01MAB3 he course is devote 01MAB4 The course is devote 01MAB4 01MANA 01MANA 01MANA	The content of this subject is the exam in Linear Algebra 1. Linear Programming belems about constrained extremum problems for multivariable functions (the function is linear and the constraint equations are given inequalities). Linear Algebra 1 The subject summarizes the most important notions and theorems related to the study of vector spaces. Calculus 1 Basic course of real analysis (functions of one real variable, differential calculus). Calculus A2 ject is devoted mainly to the integral calculus of the real functions with one real variable and to the theory of the number series and Calculus A3 Function sequences and series, foundation of topology, and differential calculus on manifolds and comple Calculus B2 Basic calculus (real analysis, indefinite and definite integrals and series). Calculus B3 d to functional sequences and series, theory of ordinary differential equations, theory of quadratic forms and surfaces, and general th and prehilbert?s spaces. Calculus A total calculus A total calculus A Calculus A d to functions of several variables, differential and integral calculus). Calculus B4 toted properties of functions of several variables, differential and integral calculus). Calculus B4 toted properties of functions of several variables, differential and integral calculus). Calculus B4 total calculus (real analysis, functions of one real variable, differential calculus). Calculus B4 total properties of functions of several variables, differential and integral calculus. Furthermore, the measure theory and theory of L Calculus B1 Basic calculus (real analysis, functions of one real variable, differential calculus). Calculus B1, Examination Examination of knowledge about stuff lectured in the 01MAN course.	Z,ZK by linear equation Z Z,ZK the power series Z,ZK Z,ZK Z,ZK eory of metric sp Z,ZK ebesgue integral Z ZK ZK	3       2       4       10       10       10       7       7       7       10       10
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01MMF	Methods of Mathematical Physics	Z,ZK	6
	is an introduction to the theory of distributions with applications to solutions of partial differential equations with constant coefficients,		
are discussed for t	he case of a continuous kernel on a compact set as well as Sturm-Liouville operators on bounded intervals, and applications of the s to the solution of some boundary value problems and mixed problems.	separation of variab	oles method
01MMPV		KZ	2
	Mathematical Models of Groundwater Flow ides an overview of computational methods for selected groundwater flow problems. The first part of the course is devoted to mathen	1	1
	problems. The second part is aimed at selected numerical methods, emphasizing implementation issues related to these methods.		5 01 11636
01NME2	Numerical Methods 2	KZ	2
	ed to numerical solution of boundary-value problems and intial-boundary-value problems for ordinary and partial differential equations.	1	1
	lary-value problems to initial-value problems and finite-difference methods for elliptic, parabolic and first-order hyperbolic partial diffe		5
01NUM1	Numerical Mathematics 1	Z,ZK	4
	uces to numerical methods for solving the basic problems arising from technical and research problems. The accent is put on a good	1 1	the root of
	theoretical methods.		
01PERI	Programming of Peripherals Devices	Z	2
Memory of	rganization, input and output ports, computer bus. Software libraries for computer peripherals, 3D graphic libraries. Principles of perip	oherals device drive	ers.
01POGR1	Computer Graphics 1	Z	2
	two-semester "Computer Graphics" course is devoted to the specifics of digital display devices spanning from history up to the state of	-	
-	ental problems in 2D computer graphics is given together with their solutions. Focus is put on mathematical description of problems and ex		• •
algorithms using k	nowledge previously obtained in a variety of subjects available at FNSPE. The final part of the course covers the applications of com the process of authoring scientific documents and presentations.	puter graphics app	proaches in
0400000		7	<u> </u>
01POGR2	Computer Graphics 2 of the two-semester "Computer Graphics" course begins with a brief introduction to signal theory in the context of aliasing - a phenom	Z	2
	a well structured survey of fundamental problems in 3D computer graphics is given together with their solutions, from the description		
	put on mathematical description of problems and explanation of the corresponding algorithms using knowledge previously obtained in		
-	prithm implementation aspect such as data structures design etc. is also a matter of concern. In the last lecture, a number of theoretic		
Ū	using Blender, an open-source 3D modeling and rendering software instrument.	·	
01POPJ1	Computers and Natural Language 1	Z	2
Basic course of co	mputational processing and understanding of natural languages. Automatic methods of morphological and syntactic analysis includin	ng modern statistic	al methods
of result d	isambiguation will be discussed. Two-level morphology, tagging and language models, Viterbi algorithm, grammars, chart parsing, pr	obabilistic gramma	ars.
01POPJ2	Computers and Natural Language 2	Z	2
The goal of the cou	urse is to get acquainted with the broad topic of machine translation (MT). Machine translation is a challenging task that can serve as	s a good example for	or modeling
of systems as co	mplex as natural languages. We cover several rather different approaches to the task as well as issues related to automatic and mar	nual evaluation of tr	ranslation
	quality.	_	-
01POPR	Advanced Probability	Z	2
-	evoted to advanced Theory of probability and statistics on measure-theoretic level for general distributions of random variables. We de		-
characteristics c	f random variables and convergence criteria. Further, the theory of statistical model estimation and testing is extended for parametric		
	Drobability and Mathematical Otatistics 4		
01PRA1	Probability and Mathematical Statistics 1	Z,ZK	6
The subject is dev	voted to the introduction to Theory of probability and statistics on measure-theoretic level for discrete models, continuous distribution	Z,ZK s and general distr	6 ibutions of
The subject is dev	voted to the introduction to Theory of probability and statistics on measure-theoretic level for discrete models, continuous distribution We deal with sample an integral characteristics of random variables and variants of limit theorems are derived (LLN, CLT). This know	Z,ZK s and general distr	6 ibutions of
The subject is de random variables.	voted to the introduction to Theory of probability and statistics on measure-theoretic level for discrete models, continuous distribution. We deal with sample an integral characteristics of random variables and variants of limit theorems are derived (LLN, CLT). This know statistical processing of observations and statistical parametric model estimation.	Z,ZK s and general distr vledge is further ap	6 ibutions of plied to the
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01SITE2			1
	Computer Networks 2	Z	2
•	history and present network (LAN, WAN, use the principles and technologies). Architecture of reference model ISO/OSI. Network prot		
	ations. Internet services - mail, remote access, www. Secure communication, tunneling. Directory services, certificates, certification author		
	actice. Network security - firewalls (packet filters, proxies, gateways, NAT, DMZ), practical exercises. (According to the interest - the se	rial control lines	, modems)
01SMB1	Seminar on Calculus B1	Z	2
	The course is devoted to support the lectures of Calculus B3.		
01SMB2	Seminar on Calculus B2	Z	2
	The course is devoted to support the lectures of Calculus B4.		1
01SOS1	Software Seminar 1	Z	2
0.0001	Java, Java Beans, Assembly language programming for microprocessors Intel 80x86	_	· -
01SOS2	Software Seminar 2	Z	2
	GTK+ and Qt. Development of graphical user interface using C and C++ programming languages. Portable applications for Unix like	_	1
erapinear instance	for Linux systems. Portability to Microsoft Windows.	oporating oyoton	no, copoolany
01SSM1		7	2
	Seminar of Contemporary Mathematics 1	_	1
01SSM2	Seminar of Contemporary Mathematics 2	Z	2
	provides a different approach to those fields of mathematics that are included in curriculum but also to those that are not part of basic		
01STR	Statistical Decision Theory	ZK	2
The subject is devo	oted to the statistical techniques for general decision procedures based on optimization of suitable stochastic criterion, their mutual cor	nparisons with re	espect to thei
	properties and applicability.		
01TKO	Theory of Codes	ZK	2
	Algebraic methods used in error detecting and error correcting codes.		1
01TOP	Topology	ZK	2
	The aim of lecture is the systematization and deepening the knowledge of general topology.		I —
01UTIZ	Introduction to Theoretical Informatics	ZK	2
01VYMA		Z,ZK	4
	Selected Topics in Mathematics		-
Fourier series: con	plete orthogonal systems, expansion of functions into Fourier series, trigonometric Fourier series and their convergence. Complex anal	ysis: derivative o	noiomorphi
	functions, integral, Cauchy's theorem, Cauchy's integral formula, singularities, Laurent series, residue theorem.		
01ZOS	Introduction to Operating Systems	Z	2
	ction to structure of operating systems. Processes, thread, memory management. Synchronization of multi=threaded applications. Me		
01ZPB1	Introduction to Computer Security 1	Z	2
02AMS	Atomic and Molecular Spectroscopy	Z,ZK	4
	The lecture is devoted to atomic and molecular spectroscopy.		
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	Machanica	7	4		
02MECH	Mechanics	Z	4		
	ics, physical quantities and units. Particle kinematics, basic types of motion and theirsuperposition. Particle dynamics, one-dimension	•			
in central force fi	in central force field, forces innoninertial reference frames. Mechanics of system of free particles, two-body problem, collisions. Mechanics ofrigid body, rotation. Fundamentals of				
	continuum mechanics, elasticity, hydrodynamics. Sound.				
02MECHZ	Mechanics - Examination	ZK	2		
	The content of the subject is the examination according to the plan of studies.		-		
001045		7	0		
02NSAD	Simulations and Data Analysis Tools	Z	2		
	Data analysis and simulations of high energy elementary particle collisions. ROOT and Pythia programs.				
02OR	General Relativity	ZK	3		
	eral theory of relativity: principle of equivalence and principle of general covariance, parallel transport and geodesic equation, gravita	ational redshift. Cu	rvature and		
	Einstein's gravitational law. Schwarzschild solution of the Einstein equations, homogeneous and isotropic cosmological mode				
000044			0		
02PRA1	Experimental Laboratory 1	KZ	6		
Lecture is intended	d especially for students who intend to study some of the physical specializations of FNSPE(branch Physical Engineering, Nuclear En	ngineering). But it	can be also		
attended by student	ts interested in the otherspecializations. In Experimental laboratory students learn how to prepare for experiments (including work with the	eliterature), the imp	olementation		
of the measuremer	nt (acquire of different experimental procedures and routines), willteach writing the records of measurement, processing and evaluation	on of results. At the	e same time		
	practically extend the knowledge gained in lectures on physics.				
02PRA2	Experimental Laboratory 2	KZ	6		
		1	-		
	d especially for students who intend to study some of the physical specializations of FNSPE(branch Physical Engineering, Nuclear En				
	ts interested in the otherspecializations. In Experimental laboratory students learn how to prepare for experiments (including work with the				
of the measuremer	nt (acquire of different experimental procedures and routines), willteach writing the records of measurement, processing and evaluation	on of results. At the	e same time		
	practically extend the knowledge gained in lectures on physics.				
02RQGP1	Seminar on Quark-Gluon Plasma 1	Z	1		
02RQOI I	The aim of the seminar is discuss the selection of the most fundamental articles in heavy ion physics.	-			
		_			
02RQGP2	Seminar on Quark-Gluon Plasma 2	Z	1		
	The aim of the seminar is discuss the selection of the most fundamental articles in heavy ion physics.				
02SMF	Seminar of Mathematical Physics	Z	2		
	he seminar is to iluminate mathematical physics by virtue of solved examples. It is supposed that the teachers of the physics departm	-	1		
		ient wiii present sii	inple tasks		
	concerning their scientific activities that could become the topics of the student?s bachelor theses in the next year		1		
02SPRA1	Special Practicum 1	KZ	6		
Physics measurem	nent focused on instrumental techniques that are mainly used in physics and technical professions. Topics of each parts are chosen s	o that students ca	n familiarize		
	with advanced pats of experimental physics and metrology.				
02SPRA2	Special Practicum 2	KZ	6		
	ent focused on instrumental techniques that are mainly used in physics and technical professions. Topics of each parts are chosen s		-		
		o mai siudenis ca	ii iaiiiiiaiize		
	with advanced pats of experimental physics and metrology.		1		
02TEF1	Theoretical Physics 1	Z,ZK	4		
			-		
The course is an inf	roduction to analytical mechanics. The students acquire knowledge of the basic concepts of the Lagrange and Hamiltonian formalism		approaches		
	· · · · · · · · · · · · · · · · · · ·	as well as diferent			
to description of d	troduction to analytical mechanics. The students acquire knowledge of the basic concepts of the Lagrange and Hamiltonian formalism lynamics (Newton's, Lagrange, Hamilton and Hamilton-Jacobi equations). The efficiency of these methods is illustrated on elementar	as well as diferent y examples like the	e two-body		
to description of d	troduction to analytical mechanics. The students acquire knowledge of the basic concepts of the Lagrange and Hamiltonian formalism lynamics (Newton's, Lagrange, Hamilton and Hamilton-Jacobi equations). The efficiency of these methods is illustrated on elementar on of a system of constrained mass points, and of a rigid body. Advanced parts of the course cover differential and integral principles	as well as diferent y examples like the	e two-body		
to description of d problem, the motion	troduction to analytical mechanics. The students acquire knowledge of the basic concepts of the Lagrange and Hamiltonian formalism tynamics (Newton's, Lagrange, Hamilton and Hamilton-Jacobi equations). The efficiency of these methods is illustrated on elementar on of a system of constrained mass points, and of a rigid body. Advanced parts of the course cover differential and integral principles the first part of the course of classical theoretical physics (02TEF1, 02TEF2).	as well as diferent y examples like the of mechanics. The	e two-body e subject is		
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	Nuclear Dhusias D	KZ	2
02ZJFB This scientific field p	Nuclear Physics B resents formidable challenges both experimentally and theoretically, simply because we are dealing with the submicroscopic domai intuition regarding the behaviour of objects fails up. The lecture is a basic introduction to your interesting regions of substantia of	n, where much of o	3 our classical
007014	intuition regarding the behaviour of objects fails us. The lecture is a basic introduction to very interesting regions of subatomic pl	-	2
02ZSM Particles, leptons, ha	Introduction to the Standard Model adrons, baryons, mesons, symmetry, symmetry group, quarks, gluons, partons, standard model of electroweak and strong interactio (QCD), cross section, scattering cross section.	ZK   ns, quantum chrom	_
04ABZK	English - State Examination	ZK	5
	t is the examination as given by the study plan. Student is eligible for the State language examination (level C1 or B2 of CEFR) only	1	
respective courses a	and examinations (04AP3KK, 04APAK, 04API, and 04APRK). From its first semester, part of the APIN programme covers also exan examination conditions comply with respective rules and regulations for state language examinations.	nination subjects. A	s required,
04AKS	English Conversation	Z	1
	elop the student's communication skills acquired throughout their previous studies. It aims to improve all aspects of oral communication		
	various communication situations and will master their communication strategy. They will also practise their listening skills in order t		participate
	cussions. The student will be trained to express their ideas clearly and according to current English usage, and become a more cor	fident speaker.	
04AM1	English for Intermediate Students M1 ned for students who have successfully completed the full secondary school English language course at least at the A2 level of the C		1 From outorld
	guages (CEFR). It provides an introduction into English for Specific and Academic Purposes (ESP, EAP), i.e., into fundamentals of		
	d written communication situations. Thus it covers topics related to the student's life and needs as well as topics of subtechnical int		
	extending the knowledge of grammar issues used in EAP.		
04AM2	English for Intermediate Students M2	Z	1
The 04AM2 course e	expects the student to have completed the 04AM1 course. It develops their skills for work with subtechnical texts, focusing also more of	on specific gramma	r, functions,
and lexical items typi	cal of ESP and EAP (e.g., definition, existence and classification of phenomena, object descriptions). Part of the course is also guided	writing. If necessar	ry, grammar
	revision is included.		4
04AM3	English for Intermediate Students M3		1 doport
	the skills that enable students to cope with features typical of professional style. Increasing attention is paid to developing subtechnic professional texts. Great emphasis is placed on distinguishing different levels of formal and informal oral and written communication	-	-
	rse also includes studying abstracts and rules for writing them as well as basic rules for preparing and giving a short presentation o		
	student's field.		
04AMZK	English for Intermediate Students Examination	ZK	4
	is the examination as given by the study plan. The examination covers the 04AM1, 04AM2, and 04AM3 courses and consists of two		0 min) and
	30 min). The student is expected to master the AM syllabus and demonstrate the ability to apply their knowledge gained in the three	-	
04AP1	English for Advanced Students P1	Z	1
-	ned for students who have successfully completed the full secondary school English language course (at least the B1 level of the C	-	
	anguages - CEFR). It provides an introduction into English for Specific and Academic Purposes (ESP, EAP), i.e., into the fundamen typical of professional oral and written communication situations (fundamentals of terms in mathematics and physics, definitions, g		
	oral and written communication on topics related to the undergraduate's life and needs. It develops skills for free professional writing (w		-
-	polite request). If necessary, revision of selected grammar topics is included.	-	
04AP2	English for Advanced Students P2	Z	1
	s based on 04AP1, thus extending the student's skills for working with subtechnical texts, and even with professional texts of chosen b		-
	eds it concentrates on chosen grammar topics, but mainly intends to develop understanding of syntactic structures and typical rhete		-
	ons, and, if possible, a case study). Increasing emphasis is placed on the undergraduate's independent work with and reading of lin rse extends the student's subtechnical vocabulary, and includes fundamental notions of chosen branches of science. It is focused o	• •	•
	sentence and paragraph structure, linking, cohesion and coherence in texts.		
04AP3	English for Advanced Students P3	Z	1
The 04AP3 course is	s based on 04AP2 and expects the student to work without any guidance with authentic professional materials and to interpret the te	xt. It includes traini	ng oral and
	ation skills and functions (e.g., expressing an opinion, agreement, and objections; taking part in discussion, note-taking; summarizin		, .
possible, also prepa	aring a project on a given or chosen topic and presenting it. The course places emphasis on distinguishing levels of formal and infor	nal language both	in oral and
	written communication.	71/	E
04APZK	English for Advanced Students Examination t is the examination as given by the study plan. The student is supposed to demonstrate mastering the 04AP3 syllabus and the abi	ZK lity to apply their kr	5 nowledge
	e 04AP courses. The examination consists of 2 parts - written (110 min) and oral (30 min) and includes also oral presentation of a to		0
	study.		
04CESM1	Czech for foreigners - Intermediate	Z	1
The course is focuse	d on correct pronunciation, important morphological phenomena, prepositional phrases, and verb forms as well as on extending the s	udent's vocabulary	/ for various
	social situations.		
04CESM2	Intermediate Czech 2	Z Z	1 the student
The course develops	s the topics covered in CESM1 and is then focused on more difficult grammar phenomena. It practices writing, speaking, and readir in understanding common abbreviations, abbreviated words, and mathematical terms and formulas.	ig skills and trains i	the student
04CESM3	Intermediate Czech 3	Z	1
	vises morphological topics covered earlier and extends the student's knowledge of more difficult language phenomena. It is especia	- 1	
	lexicology and on developing the student's writing skills.		
04CESMZK	Czech for Intermediate Students Examination	ZK	4
The course content i	is the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of the 04CE	SM1,2,3 courses a	nd can only
	be taken after successful completion of the 3 courses. Detailed information is to be obtained from the teacher.		
04CESP1	Czech for Foreign Students - Advanced Examination	Z	1 Deference
	he course is very good knowledge of the Czech language, i.e., communicative competences at least at level B2 of the Common Europ on revision of standard language structures, but mainly on practising more complex grammatical structures typical of the style of sci		
	al style of engineering and professional communication, both in spoken and written form. The topics include University Studies and S		•
	includes communication with teachers and faculty administrators.		
04CESP2	Czech for Foreigners - Advanced	Z	1
	the student's knowledge acquired in CESP1 and focuses on difficult language phenomena. It practises working with technical and	specialist texts plac	cing greater
	emphasis on individual work.		

	Czech for Foreigners - Advanced	Z	1
The course develop	bs the student's knowledge from CESP2. It includes working with authentic specialist materials, their interpretation and presentation, a	and, finally, present	ation of the
	student's project. Writing skills necessary for professional communication are trained.		
04CESPZK	Czech for Foreign Students - Advanced Examination	ZK	5
The course conten	is the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of the 04CES	SP1,2,3 courses a	nd can only
	be taken after successful completion of the 3 courses. Detailed information is to be obtained from the teacher.		
04FM1	French for Intermediate Students M1	Z	1
French - intermedia	ate FM The objective of this three-semester course is to improve and further develop communication in the French language in both w	ritten and oral forr	n. Students
	mmunicate in social interaction and in academic, scientific and professional environment. They will be able to use the language to trar	e	
	solve problems. 04FM1 The course builds on and further develops linguistic competence acquired at secondary school. It revises, syste		
	rious study. The following topics are covered: University studies in our country and in France, writing of transactional letters, CV, person		
	French culture and geography, Paris. Topics of specialization: mathematics, physics. Reading technical and popular science texts, wor		texts.
04FM2	French for Intermediate Students M2	Z	1
	on FM1. Linguistic structures and competence acquired in previous study are systemized and expanded. Reading popular science texts		
and scientific lar	guage (passives, nominalization, word formation). Topics: physics, power engineering, environment, Internet, success of French scien scientists, artists and architects. Description of an object, device, shapes, dimensions, material.	ice and technology	, French
		Z	4
04FM3	French for Intermediate Students M3	- 1	
	ed on improvement and further development of linguistic competence acquired during the follow-up courses. Syntactic structures (subc es, compound tenses). Text summaryStudents prepare a written paper which will be delivered in form of an oral presentation in-clas		
1	ture specialisation or to their interest and generally covers a technical /applied science topic. It is not a translation but a creative work (		
	s's own knowledge/experienceLonger monologues on topics /situations set for the examination are prepared. Text structure, cohesic	-	
04FMZK	French for Intermediate Students Examination	ZK	4
	examination as given by the study programme. The whole French programme is ended with an examination covering the contents of	1	-
	consists of a written and oral part and is organized according to Examination Instructions, a document available on the web		anniauUII
04FP1	French for Advanced Students P1	Z	1
-	purse The objective of this three-semester course is to improve and further develop communication in the French language in both wri	- 1	I Studente
	nunicate in social interaction and in academic, scientific and work environment. They will be able to use the language to transmit gene		
	ems. 04FP1 The course builds on and further develops linguistic competence acquired at secondary school. Difficult grammar topics a		
· ·	omposé-imparfait, pronouns. The following specific topics are covered: University studies in our country and in France, writing of trans		
	, answer to an advert, environmental issues, success of French science and technology, chosen topics from French regional culture, F		-
	mathematics, internet, physics, chemistry. Reading of technical and popular science texts, further work with these texts and interpr	etation.	
04FP2	French for Advanced Students P2	Z	1
With the link to P1	contents, the course further develops language skills. Focus is put on reading popular science texts and on oral communication on give	ven topics. Feature	s typical of
	technical and scientific communication are stressed (passive voice, nominalization, word formation).		
04FP3	French for Advanded Students P3	Z	1
The course is focus	ed on systemization and improvement of acquired linguistic competence, skills and knowledge, and their use for communication in eng	ineering environm	ent. Special
skill - translation o	f shorter texts (both from and into the language). Writing of a paper and making oral presentation in-class. The paper generally covers	a technical /appli	ed science
	topic. It is a creative work compiled from 3 French sources. Preparation of several set topics for oral examination.		
04FPZK	French for Intermediate Students Examination	ZK	5
The whole French	program is ended with an examination covering the contents of FP1-FP3. The examination consists of a written and/or an oral part and	nd is organized ac	cording to
	Examination Instructions, a document available on the web. Assessment of the presentation is included into the examination gra	iding.	
04FZ1	French for Beginners Z1	7	
	rs The objective of this 5-level course is to be able to communicate in French orally and in writing in situations of everyday life, in socia	Z	1
		alizing and in profe	
	s French for specific / technical communication and reading of popular science and scientific texts. 04FZ1 The objective is to be able to	alizing and in profe	elementary
, ,	s French for specific / technical communication and reading of popular science and scientific texts. 04FZ1 The objective is to be able to sing the knowledge of chosen elementary language. The contents is roughly outlined by lessons 1 - 7 of the textbook Pravda - Pravda	alizing and in profe o communicate at ová, French for beg	elementary ginners
(Francouzština pro	s French for specific / technical communication and reading of popular science and scientific texts. 04FZ1 The objective is to be able to using the knowledge of chosen elementary language. The contents is roughly outlined by lessons 1 - 7 of the textbook Pravda - Pravdo za áte ky). It is extended with situations of communication and functions from the textbook Espaces I, lessons 1-4 : introductions, per	alizing and in profe o communicate at ová, French for beg rsonal information,	elementary ginners asking and
(Francouzština pro giving the c	s French for specific / technical communication and reading of popular science and scientific texts. 04FZ1 The objective is to be able to sing the knowledge of chosen elementary language. The contents is roughly outlined by lessons 1 - 7 of the textbook Pravda - Pravda za áte ky). It is extended with situations of communication and functions from the textbook Espaces I, lessons 1-4 : introductions, per inections, simple instructions and questions. Special attention is paid to pronunciation. Spelling is explained in connection with pronun	alizing and in profe o communicate at ová, French for be rsonal information, nciation and gramn	elementary ginners asking and nar.
(Francouzština pro giving the o 04FZ2	s French for specific / technical communication and reading of popular science and scientific texts. 04FZ1 The objective is to be able to ising the knowledge of chosen elementary language. The contents is roughly outlined by lessons 1 - 7 of the textbook Pravda - Pravda za áte ky). It is extended with situations of communication and functions from the textbook Espaces I, lessons 1-4 : introductions, per lirections, simple instructions and questions. Special attention is paid to pronunciation. Spelling is explained in connection with pronun French for Beginners Z2	alizing and in profe o communicate at ová, French for be rsonal information, nciation and gramn Z	elementary ginners asking and nar. 1
(Francouzština pro giving the o 04FZ2 The course is linkir	s French for specific / technical communication and reading of popular science and scientific texts. 04FZ1 The objective is to be able to sing the knowledge of chosen elementary language. The contents is roughly outlined by lessons 1 - 7 of the textbook Pravda - Pravda za áte ky). It is extended with situations of communication and functions from the textbook Espaces I, lessons 1-4 : introductions, per lirections, simple instructions and questions. Special attention is paid to pronunciation. Spelling is explained in connection with pronun French for Beginners Z2 g up with 04FZ1. Elementary linguistic knowledge and communication skills are expanded. The scope is given by lessons 8 - 13 of the	alizing and in profe o communicate at ová, French for be rsonal information, nciation and gramn Z e textbook: Pravda	elementary ginners asking and har. 1 - Pravdová
(Francouzština pro giving the o 04FZ2 The course is linkir : French for Begin	s French for specific / technical communication and reading of popular science and scientific texts. 04FZ1 The objective is to be able to sing the knowledge of chosen elementary language. The contents is roughly outlined by lessons 1 - 7 of the textbook Pravda - Pravda za áte ky). It is extended with situations of communication and functions from the textbook Espaces I, lessons 1-4 : introductions, per lirections, simple instructions and questions. Special attention is paid to pronunciation. Spelling is explained in connection with pronun French for Beginners Z2 g up with 04FZ1. Elementary linguistic knowledge and communication skills are expanded. The scope is given by lessons 8 - 13 of the nners . Additional topics and skills are filled in from the textbook Espaces I, lesson 1 - 5 (introductions, invitation, welcoming, agreeme	alizing and in profe o communicate at ová, French for beg sonal information, nciation and gramn Z e textbook: Pravda ent - disagreement,	elementary ginners asking and har. 1 - Pravdová apology,
(Francouzština pro giving the o 04FZ2 The course is linkir : French for Begin	s French for specific / technical communication and reading of popular science and scientific texts. 04FZ1 The objective is to be able to sing the knowledge of chosen elementary language. The contents is roughly outlined by lessons 1 - 7 of the textbook Pravda - Pravda za áte ky). It is extended with situations of communication and functions from the textbook Espaces I, lessons 1-4 : introductions, per lirections, simple instructions and questions. Special attention is paid to pronunciation. Spelling is explained in connection with pronun French for Beginners Z2 g up with 04FZ1. Elementary linguistic knowledge and communication skills are expanded. The scope is given by lessons 8 - 13 of the nners . Additional topics and skills are filled in from the textbook Espaces I, lesson 1 - 5 (introductions, invitation, welcoming, agreeme map of France, food, expression of will, wish, order, prohibition, pleasure). Correct pronunciation is practiced. Stress on oral communic	alizing and in profe o communicate at ová, French for beg sonal information, nciation and gramn Z e textbook: Pravda ent - disagreement,	elementary ginners asking and har. 1 - Pravdová apology,
(Francouzština pro giving the o 04FZ2 The course is linkir : French for Begin thanking, travelling	s French for specific / technical communication and reading of popular science and scientific texts. 04FZ1 The objective is to be able to using the knowledge of chosen elementary language. The contents is roughly outlined by lessons 1 - 7 of the textbook Pravda - Pravda za áte ky). It is extended with situations of communication and functions from the textbook Espaces I, lessons 1-4 : introductions, per lirections, simple instructions and questions. Special attention is paid to pronunciation. Spelling is explained in connection with pronun <b>French for Beginners Z2</b> g up with 04FZ1. Elementary linguistic knowledge and communication skills are expanded. The scope is given by lessons 8 - 13 of the textbook Espaces I, lesson 1 - 5 (introductions, invitation, welcoming, agreeme map of France, food, expression of will, wish, order, prohibition, pleasure). Correct pronunciation is practiced. Stress on oral communication. How does the machine work? A few expressions concerning the study. Name of University and Faculty.	alizing and in profe o communicate at ová, French for beg sonal information, nciation and gramn Z e textbook: Pravda ent - disagreement, ration. Specific topi	elementary ginners asking and har. - Pravdová apology, cs covered:
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	ssues together with all necessary expressions and phrases, expressions and phrases needed to chemists, mathematicians, physicists terminology. It develops communication on related topics and is aimed at correct pronunciation, grammatical correctness and unders		ntals of IT
04NM2	German for Intermediate Students M2	7	1
-	uces other more complex grammatical structures and their application in communication based on technical texts, such as the relation b	etween technology	and society,
	beginning of the 21st century, linguistically more demanding texts on the environment, the language of mathematics, computers and		
practise reading for	or information and reading aloud, and appropriate language for various purposes in oral and written communication. The course systemation and reading aloud, and appropriate language for various purposes in oral and written communication. The course systematic	ically revises other	grammatical
04NM3	phenomena important for professional discourse (participles, relative clauses).	Z	1
	German for Intermediate Students M2 uces other more complex grammatical structures and their application in communication based on technical texts, such as the relation b	-	and society
	beginning of the 21st century, linguistically more demanding texts on the environment, the language of mathematics, computers and		-
practise reading for	or information and reading aloud, and appropriate language for various purposes in oral and written communication. The course systemati phenomena important for professional discourse (participles, relative clauses).	ically revises other	grammatical
04NMZK	German for Intermediate Students Examination	ZK	4
	nt is the examination as given by the study plan. The whole German for Intermediate Students Course is completed by an examination	1	1 -
and oral, which co	ver the courses 04NM1 - 04NM3. The oral part follows after passing the written part successfully and after obtaining the 04NM3 assess	nent. More detailed	information
	is to be obtained from the teacher.	1	1
04NP1	German for Advanced Students P1	Z	1
	ires good grammar knowledge, extended general vocabulary, and good communication skills acquired at secondary school to be leve rse is then focused on working with technical and scientific texts and practising reading techniques (skimming, scanning, reading for d	-	-
	i.e., telephoning.		-
04NP2	German for Advanced Students P2	Z	1
	pps the students' skills in working with professional scientific texts (understanding, summarising, note-taking, interpreting) while extending	-	subtechnical
	It introduces mathematical expressions and texts of nuclear power engineering. Increasing emphasis is placed on understanding and pr	-	
	both written and oral (CV, letter of application, interview, scholarship), and more complex grammatical structures (i.e., subjunctive, indi	rect speech).	1
04NP3	German for Advanced Students P3	Z	1
	sists of 3 main parts (general communicative situations, grammar and technical topics). Students will develop their vocabulary in a vari	-	
	and car accidents, accident report, filling in a form, complaints). Based on presentations and technical and subtechnical texts, the voca Ingineering, the environment, computer science, and car technology, will also be extended. Only authentic professional texts are used.		
-	ed to process information gained from their reading of complex and difficult texts and present it to the class in a simplified oral form. The other sectors are used.		
	practice to and from German.		e nanoianon
04NPZK	German for Advanced Students Examination	ZK	5
	ent is the examination as given by the study plan. The whole German for Advanced Students Course is completed by an examination c		
and oral, which co	over the courses 04NM1 - 04NM3. The oral part follows after passing the written part successfully and after obtaining the 04NP3 ungrad	ded assessment. M	lore detailed
04RM1	information is to be obtained from the teacher. Russian for Intermediate Students M1	Z	1
-		L 2	
		, (both printed and h	andwritten)
basic vocabulary	igned for students with previous knowledge of Russian from secondary schools. Students are supposed to know the Russian alphabet for communication in everyday situations (introductions, socializing, greetings, shopping for food and objects of everyday need, asking		
-		the way and giving	directions),
they can use b	for communication in everyday situations (introductions, socializing, greetings, shopping for food and objects of everyday need, asking asic grammar structures (verbal and nominal forms, irregular verbs, pronouns). The initial knowledge corresponds to the achievement contents and scope of the course correspond approximately to the RZ3 course, but for half of the time allotted in the timetal	the way and giving level of the RZ2 co ble.	directions),
-	for communication in everyday situations (introductions, socializing, greetings, shopping for food and objects of everyday need, asking asic grammar structures (verbal and nominal forms, irregular verbs, pronouns). The initial knowledge corresponds to the achievement contents and scope of the course correspond approximately to the RZ3 course, but for half of the time allotted in the timetat Russian for Intermediate Students M2	the way and giving level of the RZ2 co ble.	directions),
they can use b 04RM2	for communication in everyday situations (introductions, socializing, greetings, shopping for food and objects of everyday need, asking asic grammar structures (verbal and nominal forms, irregular verbs, pronouns). The initial knowledge corresponds to the achievement contents and scope of the course correspond approximately to the RZ3 course, but for half of the time allotted in the timetate Russian for Intermediate Students M2 The course is based on the RM1 course, its contents and scope correspond roughly to RZ4, however, for half of the time allotted in the	the way and giving level of the RZ2 co ble.	directions), purse. The
they can use b 04RM2 04RM3	for communication in everyday situations (introductions, socializing, greetings, shopping for food and objects of everyday need, asking asic grammar structures (verbal and nominal forms, irregular verbs, pronouns). The initial knowledge corresponds to the achievement contents and scope of the course correspond approximately to the RZ3 course, but for half of the time allotted in the timetal Russian for Intermediate Students M2 The course is based on the RM1 course, its contents and scope correspond roughly to RZ4, however, for half of the time allotted in the metal Russian for Intermediate Students M3 ps the knowledge and skills acquired in RM1 and RM2 and its contents and scope are roughly at the same level as those of RZ5, however, for the same level as the same le	the way and giving level of the RZ2 co ole. Z ne timetable. Z	directions), purse. The
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04RZ3	Russian for Beginners Z3	Z	1
	ed on RZ2 and includes further everyday topics, develops understanding of short compact texts on new subtechnical topics (for training		•
and listening) an	nd introduces new grammar. Students will be trained to distinguish intonation patterns while listening to spoken language. They will be understood, and to express their opinion. Writing skills will be trained on guided writing tasks and note-taking.	able to respond so	as to be
04RZ4	Russian for Beginners Z4	7	1
	ased on 04RZ3. It improves and expands the knowledge of general language in all four skills (reading and understanding longer texts		entage of
	oral communication in everyday situations, writing longer texts). Students are trained to use grammar structures effectively (e.g., irreg		-
patterns from Cz	ech, modality, imperatives, conditionals). They practice and develop communication skills for everyday situations (food, travelling, free	time), and practice	e oral and
written communic	ation on more specific topics (environment, addictions, the green movement). They become acquainted with various geographical dat	a (e.g., Siberia), lea	arn how to
	fill in forms, look up the information from the timetable, learn about Russian holidays and typical meals.		
04RZ5	Russian for Beginners Z5	Z	1
	s the student to have completed RZ4. It concentrates predominantly on reading skills (working with professional texts, i.e. understandin		- 1
	specialized text) and speaking, and to a certain extent, writing about the professional information obtained by reading the texts. Comr Studying grammar is based on professional and technical texts and only includes items typically used in professional communication (		
	ve voice). Students develop their technical and economic vocabulary, and are also trained in some professional skills (writing a CV, po		barticipies,
04RZZK	Russian for Beginners Examination	ZK	3
	nt is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowled	ige and skills acqui	ired in RZ1
- RZ5. Stud	lents are eligible for the oral examination only after a prior pass in RZ5 and a successful written examination. Students are given instr	uctions by the teac	her.
04SM1	Spanish for Intermediate Students M1	Z	1
	signed for students whose competence is at level B1 of CEFR, i.e. those who studied Spanish in the secondary school. The 3-semest	-	
	ays attention to further grammar topics (e.g., perifrasis verbales, futuro imperfecto, direct object and indirect object pronouns, negativ	-	
	e), to written and oral communication on a given everyday or easy subtechnical topic, for which the students are trained by reading tex	ts or listening to the	em.
04SM2	Spanish for Intermediate Students M3 ops the students' knowledge from the previous course (SM1). Students are gradually acquainted with fundamentals of Spanish for sp		T order to be
	able to work with specialized texts on the Internet.	some purposes in 0	
04SM3	Spanish for Intermediate Students M3	Z	1
	are supplemented with additional subtechnical materials, so the students will be gradually acquainted with the peculiarities of academi	_	competent
	Internet in Spanish and search for information of their specialization or field of interest. Students will use the information to write shore		
	final part of the programme, general Spanish course based on course books, covers presentations and, finally, a written and oral ex	amination.	
04SMZK	Spanish for Intermediate Students Examination	ZK	4
The course conte	ent is the examination as given by the study plan. 04SMZK examination consists of two parts - written and oral; to be eligible for the w	ritten part, students	s will have
04004	obtained non-graded assessment for course 04SM3.Oral examination follows the written part.	7	4
04SP1	Spanish for Advanced Students P1 es on more difficult grammar topics, revision of vocabulary, basics of Spanish for specific purposes as well as written communication.	Z Z	as: lovel B2
	of CEFR.	Course prerequisite	es. level DZ
04SP2	Spanish for Advanced Students P2	Z	1
	second part of the advanced Spanish course, extending Spanish for specific purposes topics. It comprises more grammar and synta	k and focuses on in	dependent
	written communication.		
04SP3	Spanish for Advanced Students P3	Z	1
Course 04SP3 is th	ne final part of the advanced Spanish course. It is based on texts chosen by the students according to their future specialization. It is focu	ised on written com	munication
	based on what students will need in their career.		
04SPZK	Spanish for Advanced Students Examination	ZK	5
	ent is the examination as given by the study plan. Examination 04SPZK consists of two parts, namely oral and written. The prerequisit aving passed the written test. Examination content is based on syllabi of courses SP1, SP2, and SP3 or on an individual study plan o		Jiai part is
04SZ1	Spanish for Beginners Z1	7	1
	he first stage of the five-semester programme of Spanish studies; during the first stage the students will master phonetics and fundar	ا بے بے بے ا iental grammar stru	uctures and
	to communicate at an elementary level on topics of everyday life. They will acquire and extend fundamental vocabulary of general Spa	-	
04SZ2	Spanish for Beginners Students Z2	Z	1
Course 04SZ2 is	based on course 04SZ1, and expects students to develop and extend the knowledge and skills acquired so far. Grammar structures a	nd lexis will be cho	osen so as
to enable them to u	understand short adapted written texts and speech. Attention is also paid to cultural differences between Spanish-speaking countries	and others such as	s the Czech
0.1070	Republic. Realia of Spanish-speaking countries are also included.		
04SZ3	Spanish for Beginners Z3	Z	1
	ed on course SZ2, and develops the student's vocabulary and grammar structure. The course covers realia (history and culture) of the It pays attention to further grammar topics (pretérito perfecto, pretérito indefinido, pretérito imperfecto, the gerund and the imperative		
	communication on a given general topic, for which the student is trained by reading texts or listening to them.	. It includes written	
04SZ4	Spanish for Beginners Z3	Z	1
	ed on course SZ3. It develops the student's vocabulary and extends the knowledge of the culture and social customs of the Spanish		, mainly of
Spain. It pays atte	ntion to further grammar topics (perífrasis verbales, futuro imperfecto, direct object and indirect object pronouns, negative form of the	imperative, and su	bjunctive),
	to written and oral communication on a given general or subtechnical topic, for which the student is trained by reading texts or listeni	ng to them.	
04SZ5	Spanish for Beginners Z5	Z	1
The course books	are supplemented with additional subtechnical materials, so the students will be gradually acquainted with peculiarities of Spanish for		. In its final
040771/	part, the general Spanish course based on the course book will end with presentations and, finally, a written and oral examina		
04SZZK	Spanish for Beginners Examination ent is the examination as given by the study plan. Examination consists of two parts - written and oral. Student can register for oral ex	ZK amination only if he	3 e/she has
	passed the written examination test.	anniadon only il ne	LISHE HAS
11ANEL		7 71/	4
		//K	
	Linear Circuit Analysis introduction to the linear electronics for physicists. In the first part it describes basic methods of linear circuit analysis. It is especially	Z,ZK priented to the unde	-
		oriented to the unde	-
	introduction to the linear electronics for physicists. In the first part it describes basic methods of linear circuit analysis. It is especially	oriented to the unde	-
The course is the 11APLG Consideration of a	introduction to the linear electronics for physicists. In the first part it describes basic methods of linear circuit analysis. It is especially of the computer methods of analysis. The second part gives a short list of most commonly used circuits in experimental equipr	oriented to the undenent.	erstanding 2 ateractions

11ELEA	vibrations, and selection rules for optical absorption transitions.	it, normal modes	
	Instrumentation and Measurement The course is the introduction to the instrumentation and measurement for physicists.	Z,ZK	2
11FKO1	Physics of Metals 1 The goal of this subject is to give students basic knowledge in area physic of metals.	ZK	3
11MIK	Logical Circuits and Microprocessors	Z,ZK	4
	e introduction to the digital electronics for physicists. It describes the function principles of combination circuits, simple sequential circu microprocessors. The microcomputer architecture and principles of interfacing is shown.		
11SFBM	Structure and Function of Biomolecules	Z,ZK	3
	cromolecular structure is crucial for the understanding of its function. The subject is focused on the introduction to building blocks of mac and its structure:function relationship including macromolecular complexes.		1
11UFPLN	Introduction to Solid State Physics The purpose of this lecture is to introduce the undergraduate students to the study of the solid state physics.	ZK	2
11UVOD	Introduction to Specialization The purpose of this lecture is to introduce the undergraduate students to the physical master degree study programmes.	Z	2
11ZFPL	Basic to Solid State Physics	KZ	2
-	damental properties of solids following the regular long distance ordering of atoms in a crystal lattice. Based on the introduced bonding		
	es of crystals and their properties are defined. The model of crystalline lattice dynamics in harmonic approximation is described and basic periodic potential of the crystal lattice is introduced and its relation to the following model describing the energetic state of electrons in		-
	xplained. The special consequences of band approach to the physical properties of solids are elucidated. The aim of the course is to s		
	interpret a broad phenomenological basis of physical properties of crystalline solids	,,,,,,	
12APL	Application of Lasers	Z,ZK	2
	pplication of lasers in industrial technologies, medicine, remote sensing, energetics, telecommunication, military, entertainment and ot	ner branches.	· ·
12AUX	Administration of UNIX System Basic and more advanced administration of Unix operating system	KZ	2
12EGS1	English Graduate Standard 1	KZ	4
	knowledge in English, English Presentation, English Discussions, creation of the technical text, structures of important documents, Pre		1
12EPR1 The aim of the p	Basic Electronics Practicum 1 racticum is 1) to acquire basics skills in electronics and 2) to learn independent problem solving, formulation of a task and formulation	KZ of the results. The	practicu
405000	consists of blocks lasting 4 hours.	1/7	
12EPR2 The aim of the p	Basic Electronics Practicum 2   racticum is 1) to acquire basics skills in electronics and 2) to learn independent problem solving, formulation of a task and formulation	KZ of the results. The	practicu
12INS1	consists of blocks lasting 4 hours. Information Systems 1	Z,ZK	2
	   plogy, architecture of the databases, network databases, cloud application Google, Microsoft, information managament, aproaches to sol		
12INS2	Information Systems 2	Z,ZK	2
	nformation systems 1 is required. In more details: Information technology, architecture of the databases, network databases, cloud app information managament, aproaches to solve task of information systems	,	1
12LAS	Laser Systems	Z.ZK	3
	e nanosecond lasers. Picosecond lasers. High energy laser systems. Laser fusion. Diode-pumped solid state lasers. Tunable lasers. O s. Semiconductor lasers for pumping of solid state lasers and diode pumped solid state lasers Amplified spontaneous emission. Ultravio	ptical parametric plet lasers. X-ray	-
	power continuous lasers. Infrared high power lasers. Submilimeter lasers. Lasers with high degree of coherence. Free electron la		-
12LT1	Laser Technique 1	Z,ZK	3
•	Stability. Transverse and Longitudinal Modes. Elements of Open Resonators. Threshold of laser oscillations. Gausian beam as an apprethod. Optical radiation propagation in resonant medium. Two-level approximation. Equations for polarisation and inversion, dispersior		
mode. Abob m	non-coherent pulse propagation. Optical solitons. Photon echo. Superradiation. Amplified spontaneous emission Lasers without optical		crem and
12LT2	Laser Technique 2	Z,ZK	2
	Laser oscillator, the rate equation, the laser amplifier, Q-switching, mode-locking	_,	-
	Molecular Physics	ZK	
12MOF	increation in price	ΔN	2
	ideas on multi-atomic molecules and molecular matter, and on structure-to-physical properties relations. Methods of molecular structure		2
Basic 12MPR1	ideas on multi-atomic molecules and molecular matter, and on structure-to-physical properties relations. Methods of molecular structure Microprocessors 1	re determination. ZK	4
Basic 12MPR1 Microprocessor a	ideas on multi-atomic molecules and molecular matter, and on structure-to-physical properties relations. Methods of molecular structure Microprocessors 1 and microcomputer, microprocessor types, memory types CPU, memory, Input output. Code and data, addressing modes( direct, indirect, indirect)	re determination. ZK ect, register, relati	4 ve,, stad
Basic 12MPR1 Microprocessor a	ideas on multi-atomic molecules and molecular matter, and on structure-to-physical properties relations. Methods of molecular structure Microprocessors 1 and microcomputer, microprocessor types, memory types CPU, memory, Input output. Code and data, addressing modes( direct, indire e calls, IO devices - program control, interrupt. Microprocessor Microchip PIC16F877A, Instruction codes- Assembler and Macroassem	re determination. ZK ect, register, relati	4 ve,, stad
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Basic 12MPR1 Microprocessor a nemory, procedur 12MPR2 A 12NME1 here are explaine mportant for physical 12NT Lectures will intro- different technol nanostructure pre-	ideas on multi-atomic molecules and molecular matter, and on structure-to-physical properties relations. Methods of molecular structure in the matter is and microcomputer, microprocessor types, memory types CPU, memory, Input output. Code and data, addressing modes( direct, indire e calls, IO devices - program control, interrupt. Microprocessor Microchip PIC16F877A, Instruction codes- Assembler and Macroassem RISC processors - principles         Microprocessors 2         rchitecture IA-32. Data types and addressing. Memory segmentation and paging. Real and privileged mode. Instruction set, Assemble Numerical Methods 1         ed the basic principles of numerical mathematics important for numerical solving of problems important for physics and technology. Met sicists (ordinary differential equations, random numbers) are included in addition to the basic numerical methods. Integrated computati used as a principle programming language as a demonstration tool. The seminars are held in computer laboratory.         Nanotechnology         duce students mainly to modern technological methods of preparation of semiconductor, metal and dielectric nanostructures. Physical ogies (MBE, MOVPE, EBL, sol-gel and colloidal solution) will be explained. Substantive attention will be devoted to epitaxial technology	re determination. ZK ect, register, relatibler, programming ZK r. description. Z,ZK hods for solution onal environment ZK and chemical fur ies which are sub ostructure and na	4 ve,, stac g languag 2 2 4 of tasks v MATLAB 2 ndaments stantial fo
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Basic 12MPR1 Microprocessor a nemory, procedur 12MPR2 A 12NME1 here are explained important for physical 12NT Lectures will intro- different technol nanostructure pre-	ideas on multi-atomic molecules and molecular matter, and on structure-to-physical properties relations. Methods of molecular structure         Microprocessors 1         and microcomputer, microprocessor types, memory types CPU, memory, Input output. Code and data, addressing modes( direct, indire         re calls, IO devices - program control, interrupt. Microprocessor Microchip PIC16F877A, Instruction codes- Assembler and Macroassem         RISC processors - principles         Microprocessors 2         rchitecture IA-32. Data types and addressing. Memory segmentation and paging. Real and privileged mode. Instruction set, Assemble         Numerical Methods 1         ed the basic principles of numerical mathematics important for numerical solving of problems important for physics and technology. Met         sicists (ordinary differential equations, random numbers) are included in addition to the basic numerical methods. Integrated computati         used as a principle programming language as a demonstration tool. The seminars are held in computer laboratory.         Nanotechnology         duce students mainly to modern technological methods of preparation of semiconductor, metal and dielectric nanostructures. Physical ogies (MBE, MOVPE, EBL, sol-gel and colloidal solution) will be explained. Substantive attention will be devoted to epitaxial technolog         aparation. Particular emphasis will be focused on detail characterization of "in situ" and "ex situ" techniques, their applications for heter scussed as well. Some supportive technical methods - lithography, diffusion, evaporation, ion implantation, contact and dielectric layer scussed as well.	re determination. ZK ect, register, relatibler, programming ZK r. description. Z,ZK hods for solution onal environment ZK and chemical fur ies which are sub ostructure and na	4 ve,, stac g languag 2 2 4 of tasks vu MATLAB 2 ndaments stantial fo inostructu

12PEL1	Practical Electronics 1	Z,ZK	2
	basics electronic, mathematical analyses of circuit solving. Measurement in electronic, measurement of frequency and phase. Analog	1 ' 1	
	digital signal processing. Function of voltmeter, ampermeter, oscilloscope, spectral analyser and logical analyser.	gue to aigital conve	
		774	0
12PEL2	Practical Electronics 2	Z,ZK	2
	Noise analyses in electronics, low noise electronics system design. Noise measurement. Time measurement. Printed circuit de	-	_
12PIN1	Practical Informatics for Technics 1	Z	2
	pperating systems. Personal computer, workstation and supercomputers. Processor, memory, bus, devices, hard disk, network interfa		
	ing systems. Requirements on operating system for research and technical computing. Operating system UNIX. Basic principles, kernel, k		
	ibutes, working with files. Text editors: vi, emacs. Command interpreter (shell) sh, csh and its programming (scripts). Controlling proce-		
load a process p	riorities. Standard tools. Graphical user interface X-windows. Computer networks. Local computer networks. Global computer network		sses and
	protocols TCP/IP. Network configutation of a computer. Network services: hardware sharing, mail, ftp, etc. Network application	ons	
12PIN2	Practical Informatics for Technics 2	Z	2
Practically oriented	d three semester course of basics and applications of informatics for science and engineering included as obligatory alternative course	se. Constituent par	t is realized
	in computer classrooms. The second part of the course is "Introduction to computer algebra systems?.		
12PIN3	Practical Informatics for Technics 3	Z	2
Practically oriented	d three semester course of basics and applications of informatics for science and engineering included as obligatory alternative cours	se. Constituent par	t is realized
-	in computer classrooms. The third part of the course is "Introduction to scientific computing?.		
12POAL	Computer Algebra	KZ	2
	n of basic objects (integers, rational and algebraic numbers, polynomials, rational functions, radicals, algebraic functions), arithmetics, s	1 1	
	derivation, series summation, integration, ordinary differential equations, factorization, equations solving, quantifier elimination, subs	1	
	ning, graphics, Maple - detailed introduction and solving of practical examples, applications, overview of other systems (Axiom, Macsy	•	
12PSEM		7	2
	Problem Seminary	∠	
	th topics from the region of solid materials engineering, physical electronics, materials science, nuclear reactors, dosimetry and appli	-	
12PYTH	Scientific Programming in Python	Z	2
	rse is to learn the fundamentals of the modern Python programming language with a focus on scientific computing. Emphasis is place		
	ourse is performed in an interactive form of practical exercises, whose topics can be tailored to the content of other subjects or stude		
-	ng research. In the introductory part of the course, students learn the basic features of Python? from basic types to object oriented or		-
greater part of th	e course focuses on specific features of Python for scientific programming. Presented are the main numerical libraries NumPy, SciPy	/ and the Matplotlib	graphics
	library. We show how to generate efficient code, how to combine Python with other languages, what tools are available.		
12TAIS	Ion Beam Techniques and Applications.	ZK	3
	Production and forming of ion beam, charged particle optics, interaction of ion with solid matter, technological and analytical appl	ications.	
12ULT	Introduction to Laser Technique	Z,ZK	3
Overview of ele	, ctromagnetic radiation sources; laser principle; classification of lasers; characterization and rough application of various types of lase		cautions.
12UMF	Introduction to Modern Physics	Z	3
	ded to be a concise introduction to modern / nonclassical physics for students who have already had basic classical physics course. A	I – I	-
	in a computational laboratory.	part of the couldo	
10\/A/		КZ	4
12VAK	Vacuum Physics and Technology	1	4
-	: basic concepts and relations; flow of rarefied gas. Interaction of gas with surface of solid surface; sorption, desorption; evaporation,	-	-
through solid ma	atter; Vacuum generation. Pumping process. Pumps. Vacuum measurements: vacuum gauges of total and partial pressure; pumping s	peed; gas flow, cor	nductivity,
	searching for leaks. Materials and vacuum instalation parts. Practical exercises.		
12VFT	High Frequency and Impulse Circuitry	Z,ZK	2
The goals of cou	rse is to collect advanced knowledge in high frequency technics and high speed events. The course is focused on Maxwell equation	solution, Gunn's dic	odes, high
	frequency technics, microwaves guidelines, striplines, oscillators, amplifiers and pulse generators.		
12VTV	Scientific and Technical Computing	Z	2
The students get	familiar with methods of solving of computational problems in the scientific and technical practice, and with methods of their program	ming. The course i	s oriented
	mainly to programming in the Fortran language.		
12ZAOP	Fundamentals of Optics	Z,ZK	2
	s the very basics of optics - electromagnetic theory, linear optical physics and material effects, basics of nonlinear effects, and geome	1 1	
the lecture is to of	otain, on the bachelor level, broad and general information on optics, giving an essential orientation in the field, especially with respe-	ct to character of th	e bachelor
	ics are further elaborated during departmental masters program. The lecture stems from the electrodynamic notion of plane waves in		
	ther from material medium. It explains basics of linear and nonlinear response in material medium and dispersion properties. It next i		
	it explains processes induced by boundary conditions at interfaces. It also discusses the consequences of statistics on interference	-	
of two-wave interfe	ence and their applications in interferometers. Based on the Fresnel diffraction integral, diffraction processes are presented in a graphic	al form, including fu	indamentals
of grating diffraction	n. Based on this diffraction principle, basic functioning of holography is clarified. Finally, the lecture unravels the geometrical optics limi	t. It takes notice on	geometrical
ap	proach imaging, substitutive schema of a paraxial imaging system, and optical aberrations. It shows fundamentals of imaging in optic	al instruments.	-
12ZDP	Data Processing for Publishing	Z	2
	uter computer-assisted publishing, coding of text, OCR (optical code recognition), DTP (desk top publishing), programming language	I – I	
	bublishing into www pages, cloud computing, commonly used graphical formats, formatting of typical data (PDF, PS, DOC, DOCX, PP		
,,,,,	multimedial presentations, multimedial formats.	-,,,	-, ,,
12ZEL1	Basic Electronics 1	Z,ZK	3
	des primary knowledge of circuit theory concerning principles of electronic circuits in both stationary and harmonic stable state. Circu	1 1	
	e symbolic and complex method are explained. Proper circuit analysis is also lectured. The subject's final part deals with transient eff		
12ZEL2	Basic Electronics 2	Z,ZK	3 avita field
-	ws up with the Basic Electronics 1. Semiconductor elements basic properties are explained. Thecourse's final part deals with basic th	-	
12ZFP	Principles of Plasma Physics	Z,ZK	. 4
	gh temperature plasmas is explained using particle, kinetic and fluid approaches. It includes drift motions and adiabatic invariants, line	-	-
	electromagnetic waves in inhomogeneous plasmas. Basic non-linear effects, such as ponderomotive force, self-focusing and param		e explained.
	comprises brief introduction into magnetohydrodynamics and nuclear fusion. Basics of atomic physics od multiply-ionized plasmas a		
12ZMD	Measurement and Data Processing	KZ	2
Basic knowledge	for the measurements and data processing and result interpretation: errors, precision, accuracy, normal distribution and its propeties	data fitting, separa	ation of the
	signal from the noise.		

12ZPLT	Basic Laser Technique Laboratory	KZ	6
	Nd:YAG laser, laser crystal, laser discharge lamp, laser cavity, resonator, free-running, Q-switching, laser amplifier. second harmonic	1 1	
	de pumped Nd:YAG laser, CO2 laser marking, laser materials properties, non-linear transmission, laser beam transverse profile, aco	-	-
12ZPOP	Basic Optical Laboratory	KZ	6
	he practical laboratories give advanced practical skills by experimental work in optics and optoelectronics. Laboratory records must b	1 1	Ũ
14BPSM1	Bachelor Thesis 1	Z	5
	Student under guidance of his/her supervisor has been working on the given particular topic for one year.		Ū
14BPSM2	Bachelor Thesis 2	Z	10
14DYLS		Z,ZK	2
-	Dynamics of Linear Systems g of linear mechanical systems by means of simple computational system of discrete elements. Free and/or forced vibration of mecha		
	degrees of freedom. Kinetic equations of motion - their determination and solution. Analysis of motion stability.	inical systems with	
14ELMI	Electron Microscopy	Z,ZK	3
	Election Microscopy students are introduced to the microscopic methods used for the characterization of materials, thin layers or nanoparticles. The introd	1 ' 1	
	and electron microscopy and to various types of microscopes. An important part of the course is given to the interaction of different ty		
	ulations and tools used in microscopy and to the description of particular parts of the microscopes. Introduction to kinematic and dyna		
	and diffraction and imaging techniques are also covered. A particular attention is given to analytical methods and imaging techniques	-	
14EME1	Elasticity 1	Z,ZK	4
	esents an introduction for several another lectures on continuum mechanics and the strength of materials. The first part contains a de	1 · · ·	-
	elasticity. The second one represents a logical descent from the continuum mechanics to the practical engineering solution of simple	-	
	shearing and torsion in the cross section of bars and beams.		, bonang,
14FKO2	Metal Physics 2	Z,ZK	6
	round of processes encountered in production and thermo-mechanical treatment of metallic materials is described, including solidific	· · ·	-
	solid solutions, theory of dislocations, diffusion, hardening and softening of metals and alloys.		,
14TEM	Engineering Mechanics	Z,ZK	6
	se represents a link-up between the theoretical mechanics of rigid bodies and engineering disciplines dealing with stress and strain a		-
	(elasticity, plasticity, fracture mechanics, etc.). Principles of statics, kinematics, and dynamics and their application.		
14TM	Engineering Mechanics	Z,ZK	4
	esents a link-up between the theoretical mechanics of rigid bodies and engineering disciplines dealing with the stress and strain ana		
14ZZKS	Testing and Processing of Metals and Alloys	KZ	4
-	ests, hardness, impact toughness, technological testing, fatigue testing, creep testing. Light microscopy, preparation of specimens for	1	
	relding, soldering, brazing, powder metallurgy, mechanical machining. Copper alloys, aluminium alloys, titanium alloys, special alloys o		
	drawing and CAD.		
15CH1	General Chemistry 1	7	3
	t concepts, quantities and units used in chemistry are introduced in the course General Chemistry I. Their significance and practical u	use are illustrated t	-
	solved in exercises.		,
15CH2	General Chemistry 2	Z.ZK	3
	continuation of the course General chemistry I. The main attention is paid to general principles governing chemical processes. Using	1 ' 1	-
	principles is not restricted only to chemical processes is documented. The significance and practical use of explained principles are		
	in exercises.	,	
15CHEM	Analytical Calculations and Chemometry Principals	ZK	2
	basic principles of chemometry including errors in classical and instrumental analysis, probability theory, propagation of errors, basi	1	s, one- and
two-tailed significa	nce testing, hypothesis testing, least squares regression and correlation, calibration and fitting methods, non-parametric testing, sen	ninar part consists	of equation
solving, titratio	on stoichiometry of redox, acid-base, complex and precipitation reactions, gravimetric stoichiometry. pH calculations, calculations in p	otentiometry, could	ometry,
	spectrophotometry and separation methods, solving of complex forming equilibria.		
15DALCH	History of Alchemy and Chemistry	ZK	2
This course provid	des the overview of crafts with chemical and/or metallurgical basis. Development of alchemy from ancient times in China, India, and I	lellenistic world is	discussed.
The last part of o	course is dedicated to Alchemy in Arabic world and various aspects of alchemy in Latin Europe. The influence of alchemical approact	nes development o	nto crafts
	advancement is illustrated.		
15INPR	Laboratory Practice in Instrumental Methods	KZ	4
Practical training	of students in the use of selected modern instrumental methods and techniques for solving some physico-chemical analytical and otl	ners problems. The	training is
carried	out in the laboratories of Czech Academy of Sciences (Institute of Physical Chemistry) and partly in laboratory at the Department of	Nuclear Chemistry	
15ZKJE	Nuclear Power Plants Design and Operation	ZK	3
-	o create basic knowledge of physics of nuclear reactors utilizing fission. Further explains arrangement of nuclear fuel, purpose, technology	-	
of core. Function a	nd construction of all components are defined wit regard to nuclear physics, physics of shielding, theory of regulation, material science	e, chemistry, heat	transfer and
	tes knowledge for evaluation of nuclear safety and radiation protection in nuclear energy, reliability and economy for comparison with		
environment and to	strategic importancy of nuclear sources of energy. Gives basic knowledge of construction, operation and decommissioning of nuclea	r power stations. In	forms about
	high level nuclear waste and spent fuel and their management.		
16AMMB	Fundamentals of Analytical Measurement Methods	ZK	2
	echnical performance and utilization of methods of chemical analysis. Basic methodology of analytical determination, gravimetry, titra	-	-
polarography, ref	ractometry, polarimetry, UV-VIS spectroscopy, atomic emission and absorption spectroscopy, infrared and Raman spectroscopy, X-ra	y structural analysi	s, nuclear
	magnetic and electron spin resonance, mass spectrometry, thermometric methods, gas and liquid chromatography.		-
16APLB	Application of Ionizing Radiation in Analytical Methods	ZK	5 d diagnosia
Subject The applica	ation of ionizing radiation in analytical methods is devoted to radioanalytical methods and the use of radionuclides and ionizing radiatio	n in the analysis an	id diagnosis
4050414	of technological processes.	71/	0
16EPAM	Exact Methods in Research of Historic Monuments	ZK	2
	of historic monument investigations, methods of age determination (radiocarbon, thermoluminescence and related methods, further radiati		
archaeornagneti	sm), analytical methods for determination of origin and production technologies of artefacts (activation analysis, X-ray fluorescence a photogrammetry.	naiysis and other r	neurous),
		ZK	C
16FNZB	Problems of Non-ionizing Radiation I on biological effects of non-ionizing radiation and its use in physical praxis. Information about principles, biological effects and meth-		2 of magnetic
	resonance and ultrasound as applied in various types of technical or medical equipment are given as well.		n maynettu
L	recontinee and disaccours as applied in various types of technical of medical equipment are given as well.		

16KPR	Clinical Propaedeutic	ZK	2
	miliar with the basics of anamnesis, physical examination, examinational methods of different organs, hematological and biochemical	I	1
16MCRB	Transport of Ionizing Radiation and Monte Carlo Method	Z,ZK	4
	inciples of Monte Carlo method and its use for radiation transport simulation, selected concepts of probability theory and mathematica		
	rent types of radiation and their use for stochastic modeling of their substance transport. Model description concepts, geometric mode	-	
	eling of measured variables and parameters. Statistical evaluation of reliability of modeling results, variance reduction methods, progra		
	, MCNP program, its possibilities and use. Procedures for the practical use of the program for typical tasks in the field of dosimetry, a		
lanoportinouoling	detection and detection systems, radiation protection and medical applications.	pprioriter of formain	ig radiation,
16MEZB	Fundamentals of Ionizing-Radiation Metrology	Z,ZK	4
	arizes the basic objectives and content of ionizing radiation metrology. It deals with the interpretation of radiation quantities and units in	· · ·	-
	perimental foundations of metrology, the determination of basic parameters of radiation. Lectures are supplemented with basic summ		
	regulations.	ary or relevant logi	iolation and
16SED1	Dosimetry Seminar 1	7	2
	posed to motivate the student's interest in the field of dosimetry, especially in medical physics. Introductory lectures will be devoted	to support for futu	
	s. The following lectures are given by the former students of DDAIR, who are currently employed in various organizations (SÚRO, v.v.		
	MI, Hospital Na Homolce, FN v Motole, PTC Czech s.r.o.).		., 001 02,
16SED2	Dosimetry Seminar 2	Z	2
	ry 2 follows-up SED1. In this seminary students will listen to the lectures of the older students of DDAIR. The older students give lectures of the older students of DDAIR.		
-	search topic of their theses. The course also introduces the principles of creating good presentation and advice for working with scier		JIESS OF THE
16UAZB		ZK	2
	Principles of Ionizing-Radiation Applications of applications, review of interaction of radiation with a matter, radiation sources, detectors and instrumentation, evaluation of radion	I	1
	and scattering of radiation beams, selected radioanalytical methods, tracer methods, radionuclide dating, further possibilities for the u		
		-	1
16ZBAF1	Fundamentals of Human Biology, Anatomy and Physiology 1	Z,ZK	4
-	ving systems, non-cellular and cellular organisms, prokaryotic and eukaryotic cell. Molecular and cell biology. Biopolymers. Molecular		
their regulation. G	eneral human anatomy. Basics of medical terminology. Overview of tissues. Skeleton. Muscle anatomy in general. Digestive system a	na its physiology. I	Respiratory
4075450	system and physiology of respiration. Excretory and genital tract.		<u> </u>
16ZBAF2	Fundamentals of Human Biology, Anatomy and Physiology 2	Z,ZK	4
	ogy of cardiac activity. General anatomy of blood vessels, main arteries of the body, overview of veins and physiology of blood, blood		of nerves.
	S. Visual system and physiology of the visual system. Auditory and vestibular system and physiology of hearing and balance. Skin, en	-	
16ZDOZ1	Fundamentals of Radiation Dosimetry 1	Z,ZK	4
History, develop	oment, and objectives of dosimetry. Quantities and units used for description of sources, fields, interactions of ionizing radiation, ioniz	ations, energy tran	isfer and
	absorption. Fundamentals of the effects of ionizing radiation.		<del>.</del>
16ZDOZ2	Fundamentals of Radiation Dosimetry 2	ZK	2
Fundamentals of bi	ological effects of ionizing radiation. Quantities and units used in radiation protection. Recommendations of ICRP and ICRU. Principles a	and methods of me	asurements
	in dosimetry. Determination of activity and neutron source emission. Measurements of absorbed dose and exposure.		
16ZEDB	Basics of Experimantal Data Processing	ZK	2
	Statistical analysis of experimental data; univariate data; calibration; regression; multivariate data.		
16ZIVB	Introduction to Ecology	KZ	2
The subject inform	about basic of the ecologic principles, terms and ideas. It covers overview information regarding to particular components of the envirc	onment and evaluat	te economic
	indicators and sustainable development.		
16ZJTB	Nuclear Energy Facilities and Accelerators	ZK	2
Basic scheme of	nuclear reactor and nuclear power plant, chain fission reaction development, main components of nuclear energetic reactor, most im	portant reactor typ	oes, linear
high-voltage acce	elerators, linear high-frequency accelerators, accelerators based on cyclotron, microtron, betatron, electron and proton synchrotrons,	electron and ion s	ources for
	accelerators, targets.		
16ZPSP	Basic Work with PC	Z	2
The aim of the cou	rse is to acquaint students with the basic skills related to working on a personal computer. The introductory part of the course is devot	ed to information s	systems and
resources available	a at the CTU in Prague and the FNSPE. Emphasis is placed on effective handling of work with office productivity software (text editor,	spreadsheet and p	presentation
· · ·	ercises in MS Office. The practical content focuses mainly on further use during studies (laboratory reports, research work, bachelor's	•	,
specific practice (h	ospitals, state administration, companies). Other sections summarize basic information about computer hardware, software, and secur	ity. Completion of i	ndependent
	home exercises and participation in exercises above 60% is a necessary condition for passing the course.		<del></del>
16ZRAO	Basics of Radiation Protection	Z	2
	rse is to familiarize students with the general principles of radiation protection. The main emphasis is put on basic mechanisms and con	1 /	
	ield. The course provides answers to the cardinal questions: What is ionizing radiation (IR), where it comes from, whether and how it		-
	ng of protective units (Gray, Sievert), how to prevent malicious effect of IR and many others. The content of the lectures does not requ	ire any prior knowl	ledge.
17ENF	Experimental Neutron Physics	KZ	2
	mainly focused on detailed characterisation of neutron properties, characteristics of neutron (reactor and non reactor) sources, properties, characteristics of neutron (reactor and non reactor) sources, properties, characteristics of neutron (reactor and non reactor) sources, properties, characteristics of neutron (reactor and non reactor) sources, properties, characteristics of neutron (reactor and non reactor) sources, properties, characteristics of neutron (reactor and non reactor) sources, properties, characteristics of neutron (reactor and non reactor) sources, properties, characteristics of neutron (reactor and non reactor) sources, properties, characteristics of neutron (reactor and non reactor) sources, properties, characteristics of neutron (reactor and non reactor) sources, properties, characteristics of neutron (reactor and non reactor) sources, properties, characteristics of neutron (reactor and non reactor) sources, properties, characteristics of neutron (reactor and non reactor) sources, properties, characteristics of neutron (reactor and non reactor) sources, properties, characteristics of neutron (reactor and non reactor) sources, properties, characteristics of neutron (reactor and non reactor) sources, properties, characteristics of neutron (reactor and non reactor) sources, properties, characteristics of neutron (reactor and non reactor) sources, properties, characteristics of neutron (reactor and non reactor) sources, properties, characteristics of neutron (reactor and non reactor) sources, properties, characteristics of neutron (reactor and non reactor) sources, properties, characteristics of neutron (reactor and non reactor) sources, properties, characteristics of neutron (reactor and non reactor) sources, properties, characteristics of neutron (reactor and n		-
	detection methods, neutron induced nuclear reactions, modification and adjustment of neutron field, science and industry neutron approximation of the science and industry neutron approximation and adjustment of neutron field, science and industry neutron approximation and adjustment of neutron field, science and industry neutron approximation and adjustment of neutron field, science and industry neutron approximation and adjustment of neutron field, science and industry neutron approximation approximati		
	lata processing and analysis. The lectures are supplemented with experimental practices in the field of neutron detection, determination		
study of neutron dif	fusion in various materials, preparation and characterisation of photo-neutron source and neutron source calibration. Experimental practice of the second seco	ctices will be runnin	ig at training
	reactor VR-1 and in the neutron laboratory.		
17JARE	Nuclear Reactors	ZK	2
	power issue. Previous evolution of power reactor. Nuclear fission reactors, fuel assemblies, active core, control systems, safety system		
-	jenerations. Standard types of nuclear power reactors: concept, description, layout, previous evolution, world share, perspectives. Pres		, ,
	PWR (Westinghouse, KWU, Framatom). VVER-type reactors, Temelin nuclear power plant. Boiling water reactors. Heavy water react		
	gas cooled reactors. Second nuclear era. reactors of generation III (EPR, AP-1000, VVER 1200). Reactors of generation IV: GIF and		∟vaiuation
	selection of proposed systems. Six selected concepts. ICRP scenarios of word evolution, hydrogen power, role of nuclear power in lo	-	<u> </u>
17UINZ	Introduction to Engineering		3
	oted to an introduction to the engineering profession. Students will gradually learn the characteristics and specialties of engineering v	-	
THE DASIUS UI SEIEC	ted engineering disciplines, such as the basics of materials science, manufacturing technology, quality control and assurance and ec focus on some issues of R&D activities organization and on selected parts of technical drawings and the work with AutoCAI		COULSE WIII
1	issue on come issues of reamp, a admines organization and on selected parts of technical drawings and the work with AutoCAI		

17VYR	Research Reactors	ZK	2
	o research reactors and their applications for the need of research and industry. Students get familiar with research reactor types and	I	
along wit	h experimental equipment needed for particular applications and their specifics. The course is supported by technical visit to research	n reactor workplace	e.
17ZEH	Basics of Economic Assessment	ZK	2
	ses on the economic evaluation of Nuclear power plants. Introductory lectures are concerned with an introduction to economy and the	•	
microeconomics. Le	ectures continued with insight into the business and managerial economics, explanation of the concepts of incomes, expenses, etc. and		in electrical
47751	energy resources evaluation. Second part of lectures is focused on evaluation of nuclear power plants - the fuel cycle and operation		0
17ZEL	Basics of Electronics	KZ	3
	asic information of electronics. In the beginning, lectures are devoted to passive components - resistors, capacitors, inductors and so s deal with semiconductor components (standard, Zener, capacitive, LED), bipolar, unipolar transistors and semiconductor componer		
	res continue with general amplifiers and operational amplifiers. Finally, lectures deal with digital circuits, digital/analog and analog/dig	-	
	completed with electronic laboratory exercises.		
18EKO1	Mathematical Economics 1	Z,ZK	5
The course introdu	ces selected models and methods for economic decision making. The main attention is given to optimization models of linear program	ming, possibilities	of their real
	applications and their solving by means of the current software products.		
18EKO2	Mathematical Economics 2	Z,ZK	5
The course intro	duces selected models and methods for economic decision making. The main attention is given to optimization models in graphs, pro management with deterministic and stochastic demand, queuing theory and simulation models.	ject management,	Inventory
18ESPG1	European Computer Driving Licence 1	Z	2
	ators are an important tool, especially for students and graduates in Software engineering in economics. The winter semester introduc	I	
-	ccent is put on advanced functions of MS Excel (names, functions and expressions, pivot table and graph). Next, the VBA language v		
	and user functions will be addressed.		
18ESPG2	European Computer Driving Licence 2	Z	2
-	ators are an important tool, especially for students and graduates in Software engineering in economics. Summer semester follows the		
VBA programmin	g topics (charts, objects, graphical user interface, add-ins programming) and introduces some applications in economics, mathematic	s, operational rese	arch, and
	computer science.	1/7	4
18INTA	Development of internet applications e an overview of modern technologies for the development of web applications. Students will learn basic web languages and concep	KZ   ts (HTML LIRL et	4 and they
	ced to relational database systems. The tutorials are dedicated to practical examples of building web applications, from the simplest t		
	is oriented primarily towards backend technologies and using the Python languages, but covers also frontend frameworks and Jav		
18MAK1	Macroeconomics 1	Z,ZK	4
	I provides students with a fundamental theoretical basis for understanding how an economy works. It introduces main macroeconom		-
	uilibrium theory, fundamentals of open economy theory, inflation, unemployment, economic growth, economic fluctuations, basic mac		
AS-AD and their im	plications for economic policies. The learning outcomes of the course is to equip students with ability to analyze macroeconomic phenom and subsequently to use them under the conditions of modern economic life.	iena and their inter	connections
18MAK2	Macroeconomics 2	Z,ZK	4
	I extends theoretical knowledge acquired from Macroeconomics I of its students with the latest knowledge of contemporary macroeconomics	· .	
	especially those with an emphasis on the role of human capital and technological progress. Furthermore, it introduces students to m	-	
modeling, i.e., macr	oeconomic models derived from microeconomic behavior of subjects and economics and their rational expectations. It also provides stu	idents with modern	knowledge
	of labor market modeling.		
18MIK1	Microeconomics 1	Z,ZK	5
	a set of theories, which help us to understand processes by which the scarce resources are allocated among alternative uses. Micro- ets in these processes, and makes more clear behaviour of the economic agents. This course of Microeconomics I consist of introduc		
	Consumer Theory.		
18MIK2	Microeconomics 2	Z,ZK	5
	a set of theories, helping us to understand process by which scarce resources are allocated among alternative uses. Microeconomics	, ,	
markets i	n this process and make clear economic agents behaviour. The lectures of Microeconomics II are oriented on Theory of Firm and Ind	ustrial Organisatio	า.
18MPT	Programming in MATLAB	KZ	5
The subject acqua	ints students with various programming techniques in the Matlab environment. The emphasis is placed on the differences in program	ming methodology	in Matlab
	compared to classical languages.	7 71/	_
18MTL	Programming in MATLAB environment as efficient tool for computation in complex arrays and symbolic variables, namely for linear algebra, mathematic analy-	Z,ZK	5
	and geometric representation of results.	515, 5141151105, 81901	unnizauon
18PAS			
	Pascal Programming	Z	4
	Pascal Programming ntended mainly for students, with little or no experience in programming. It familiarizes the students with the basic concepts in program		4 Pascal
	Pascal Programming ntended mainly for students, with little or no experience in programming. It familiarizes the students with the basic concepts in program programming language.		
18PJ	tended mainly for students, with little or no experience in programming. It familiarizes the students with the basic concepts in program		
	ntended mainly for students, with little or no experience in programming. It familiarizes the students with the basic concepts in program programming language. Programming in Java This course is devoted to the Java platform and to the development of the basic types of applications for this platform.	The second secon	Pascal
18PJ 18PRC1	ntended mainly for students, with little or no experience in programming. It familiarizes the students with the basic concepts in program programming language. Programming in Java This course is devoted to the Java platform and to the development of the basic types of applications for this platform. Programming in C++ 1	mming and with the	Pascal
18PRC1	It familiarizes the students with little or no experience in programming. It familiarizes the students with the basic concepts in program programming language. Programming in Java This course is devoted to the Java platform and to the development of the basic types of applications for this platform. Programming in C++ 1 This course covers mainly the C programming language and non-object oriented features of the C++ language.	nming and with the Z,ZK	Pascal 5 4
18PRC1 18PRC2	Antended mainly for students, with little or no experience in programming. It familiarizes the students with the basic concepts in program programming language. Programming in Java This course is devoted to the Java platform and to the development of the basic types of applications for this platform. Programming in C++ 1 This course covers mainly the C programming language and non-object oriented features of the C++ language. Programming in C++ 2	nming and with the Z,ZK Z KZ	Pascal
18PRC1 18PRC2 This co	It familiarizes the students, with little or no experience in programming. It familiarizes the students with the basic concepts in program programming language. Programming in Java This course is devoted to the Java platform and to the development of the basic types of applications for this platform. Programming in C++ 1 This course covers mainly the C programming language and non-object oriented features of the C++ language. Programming in C++ 2 purse covers the object oriented programming and othesr advanced constructs in the C+;+ programming language and the Standard	nming and with the Z,ZK Z KZ Template Library.	Pascal 5 4 4
18PRC1 18PRC2 This co 18UOA	It familiarizes the students, with little or no experience in programming. It familiarizes the students with the basic concepts in program programming language. Programming in Java This course is devoted to the Java platform and to the development of the basic types of applications for this platform. Programming in C++ 1 This course covers mainly the C programming language and non-object oriented features of the C++ language. Programming in C++ 2 purse covers the object oriented programming and othesr advanced constructs in the C+;+ programming language and the Standard Introduction into Object Oriented Architecture	nming and with the Z,ZK Z KZ Template Library. Z,ZK	Pascal 5 4 4 4 4
18PRC1 18PRC2 This ct 18UOA 18ZALG	It familiarizes the students, with little or no experience in programming. It familiarizes the students with the basic concepts in program programming language. Programming in Java This course is devoted to the Java platform and to the development of the basic types of applications for this platform. Programming in C++ 1 This course covers mainly the C programming language and non-object oriented features of the C++ language. Programming in C++ 2 purse covers the object oriented programming and othesr advanced constructs in the C+;+ programming language and the Standard Introduction into Object Oriented Architecture Basics of Algorithmization	Template Library.	Pascal 5 4 4 4 4 4
18PRC1 18PRC2 This co 18UOA 18ZALG This course is	It familiarizes the students, with little or no experience in programming. It familiarizes the students with the basic concepts in program programming language. Programming in Java This course is devoted to the Java platform and to the development of the basic types of applications for this platform. Programming in C++ 1 This course covers mainly the C programming language and non-object oriented features of the C++ language. Programming in C++ 2 ourse covers the object oriented programming and othesr advanced constructs in the C+;+ programming language and the Standard Introduction into Object Oriented Architecture Basics of Algorithmization devoted to selected algorithms and methods for algorithm design. This course intruduces selected methods for the determination of	Template Library. Z,ZK KZ Template Library. Z,ZK Z,ZK the algorithm com	5 4 4 4 4 0lexity.
18PRC1 18PRC2 This co 18UOA 18ZALG This course is 18ZPRO	It familiarizes the students, with little or no experience in programming. It familiarizes the students with the basic concepts in program programming language. Programming in Java This course is devoted to the Java platform and to the development of the basic types of applications for this platform. Programming in C++ 1 This course covers mainly the C programming language and non-object oriented features of the C++ language. Programming in C++ 2 purse covers the object oriented programming and othesr advanced constructs in the C+;+ programming language and the Standard Introduction into Object Oriented Architecture Basics of Algorithmization	Template Library. Z,ZK Template Library. Z,ZK Z,ZK the algorithm complete Z	4 4 4 4 4 blexity. 4
18PRC1 18PRC2 This co 18UOA 18ZALG This course is 18ZPRO	It familiarizes the students, with little or no experience in programming. It familiarizes the students with the basic concepts in program programming language. Programming in Java This course is devoted to the Java platform and to the development of the basic types of applications for this platform. Programming in C++ 1 This course covers mainly the C programming language and non-object oriented features of the C++ language. Programming in C++ 2 ourse covers the object oriented programming and othesr advanced constructs in the C+;+ programming language and the Standard Introduction into Object Oriented Architecture Basics of Algorithmization devoted to selected algorithms and methods for algorithm design. This course intruduces selected methods for the determination of Basics of Programming	Template Library. Z,ZK Template Library. Z,ZK Z,ZK the algorithm complete Z	4 4 4 4 4 blexity. 4
18PRC1 18PRC2 This co 18UOA 18ZALG This course is 18ZPRO	It familiarizes the students with the basic concepts in programming. It familiarizes the students with the basic concepts in programming language.  Programming in Java This course is devoted to the Java platform and to the development of the basic types of applications for this platform.  Programming in C++ 1 This course covers mainly the C programming language and non-object oriented features of the C++ language.  Programming in C++ 2 ourse covers the object oriented programming and othesr advanced constructs in the C+;+ programming language and the Standard Introduction into Object Oriented Architecture Basics of Algorithmization devoted to selected algorithms and methods for algorithm design. This course intruduces selected methods for the determination of Basics of Programming thended mainly for students with little or no experience in programming. It familiarizes the students with the basic concepts in programming	Template Library. Z,ZK Template Library. Z,ZK Z,ZK the algorithm complete Z	4 4 4 4 4 blexity. 4
18PRC1 18PRC2 This co 18UOA 18ZALG This course is 18ZPRO This course is in	It familiarizes the students with the basic concepts in programming. It familiarizes the students with the basic concepts in programming language.  Programming in Java This course is devoted to the Java platform and to the development of the basic types of applications for this platform.  Programming in C++ 1 This course covers mainly the C programming language and non-object oriented features of the C++ language.  Programming in C++ 2 ourse covers the object oriented programming and othesr advanced constructs in the C+;+ programming language and the Standard Introduction into Object Oriented Architecture Basics of Algorithmization devoted to selected algorithms and methods for algorithm design. This course intruduces selected methods for the determination of Basics of Programming thended mainly for students with little or no experience in programming. It familiarizes the students with the basic concepts in programming anguage.	Template Library. Z,ZK Template Library. Z,ZK Z,ZK the algorithm com Z nming and with the	Pascal 5 4 4 4 4 olexity. 4 Python

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For updated information see <u>http://bilakniha.cvut.cz/en/FF.html</u> Generated: day 2024-05-19, time 09:17.