Study plan

Name of study plan: Fyzikální inženýrství - Inženýrství pevných látek

Faculty/Institute/Others:
Department:
Branch of study guaranteed by the department: Welcome page
Garantor of the study branch:
Program of study: Physical Engineering
Type of study: Bachelor full-time
Required credits: 0
Elective courses credits: 180
Sum of credits in the plan: 180
Note on the plan:

Name of the block: Povinné p edm ty specializace Minimal number of credits of the block: 0 The role of the block: PS

Code of the group: BSPFIIPL1 Name of the group: BS P_FIB IPL 1st year Requirement credits in the group: Requirement courses in the group: In this group you have to complete at least 14 courses Credits in the group: 0 Note on the group: Podmínkou skládání zkoušky 01MANZ je získání zápočtu z 01MAN.

Podmínkou skládání zkoušky 01MANZ je získání zápočtu z 01MAN. Podmínkou skládání zkoušky 01LALZ je získání zápočtu z 01LAL

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	PS
02ELMA	Electricity and Magnetism Iskender Yalcinkaya, Goce Chadzitaskos, Josef Schmidt, Jan Vysoký Jan Vysoký Goce Chadzitaskos (Gar.)	Z,ZK	6	4+2	L	PS
01LAL	Linear Algebra 1 Petr Ambrož, Lubomíra Dvo áková Lubomíra Dvo áková Lubomíra Dvo áková (Gar.)	Z	2	2P+2C		PS
01LALZ	Linear Algebra 1, exam Petr Ambrož, Lubomíra Dvo áková Lubomíra Dvo áková Lubomíra Dvo áková (Gar.)	ZK	2	0P+0C		PS
01LAL2	Linear Algebra 2 Petr Ambrož, Lubomíra Dvo áková Lubomíra Dvo áková Lubomíra Dvo áková (Gar.)	Z,ZK	4	2P+2C		PS
01MAN	Calculus 1 Miroslav Kolá, Pavel Strachota, Edita Pelantová Pavel Strachota Edita Pelantová (Gar.)	Z	4	4+4		PS
01MANZ	Calculus 1, exam Miroslav Kolá, Pavel Strachota, Edita Pelantová Pavel Strachota Pavel Strachota (Gar.)	ZK	4	0P+0C		PS
01MAN2	Calculus 2 Severin Pošta, Miroslav Kolá, Edita Pelantová Miroslav Kolá Severin Pošta (Gar.)	Z,ZK	8	4P+4C		PS
02MECH	Mechanics Iskender Yalcinkaya, David B e Michal Jex David B e (Gar.)	Z	4	4+2	Z	PS
02MECHZ	Mechanics - Examination Iskender Yalcinkaya, Goce Chadzitaskos, David B e , Filip Petrásek, Stanislav Skoupý, Antonín Hoskovec, Petr Novotný Antonín Hoskovec David B e (Gar.)	ZK	2	-	Z	PS
00PT	Preparatory Week Petr Ambrož, Milan Krbálek Petr Ambrož Petr Ambrož (Gar.)	Z	2	týden	Z	PS
02TER	Heat and Molecular Physics Filip Petrásek Petr Novotný Petr Jizba (Gar.)	Z,ZK	4	2+2	L	PS
11UFPLN	Introduction to Solid State Physics Ivo Kraus, Petr Kolenko Petr Kolenko Ivo Kraus (Gar.)	ZK	2	2+0	L	PS

	Basics of Programming					
18ZPRO	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	PS
	Vinus (Gal.)					
Characteristics	of the courses of this group of Study Plan: Code=BSPFIIPL1 Name=	BS P_FIB IF	L 1st yea	ır		
02DEF1	History of Physics 1				Z	2
Physics and its place	e in the system of sciences. The relationship of man and nature. Natural sciences in ancient Or	ientand Greece,	Greek natur	al philosoph	ers, Aristo	tle. Physics in
Helenistic period, Ar	chimed. Arabic science, European science in Middle Ages. Renaissance - da Vinci, Giordano B	Bruno. Copernicu	is, Kepler, G	alileo, Huyg	ens. The bi	irth of physics
as experimental scie	ence. Newton and his work.				,	
02ELMA	Electricity and Magnetism			Z	Z,ZK	6
Electric charge, Cou	lomb's law, electrostatic field, Gauss' law. Electric dipole, polarization. Conductors anddielectric	cs. Electric curre	nt and circuit	ts, conductiv	ity. Basics	of the relativity
theory. Electrodynan	nic forces, magnetic field. Magnetic dipole, magnetics. Electromagnetic induction, ac currents. E	lectromagnetic	waves,Maxw	ell equations	S	
01LAL	Linear Algebra 1				Z	2
•	inear dependence and independence. 3. Basis and dimension. 4. Subspaces of vector spaces.	5. Linear mappi	ngs. 6. Matric	ces of linear	mappings.	. 7. Frobenius
theorem.					,	
01LALZ	Linear Algebra 1, exam				ZK	2
01LAL2	Linear Algebra 2			Z	Z,ZK	4
Outline: 1. Inverse m	natrix and operator. 2. Permutation and determinant. 3. Spectral theory (eigenvalue, eigenvector	r, diagonalizatior). 4. Hermitia	an and quad	Iratic forms	s. 5. Scalar
	nality. 6. Metric geometry. 7. Riesz theorem and adjoint operator. Outline of the exercises: 1. Me					
of determinants. 3. C	Calculation of eigenvalues and eigenvectors. 4. Hermitian and quadratic forms. Canonical form.	5. Scalar produc	t and orthog	onality, Calc	ulation of o	orthogonal
			0			•
	ometry – exercises and examples. 7. Adjoint operators.		0			
complements. 6. Ge 01MAN	ometry – exercises and examples. 7. Adjoint operators. Calculus 1				Z	4
01MAN						4
01MAN	Calculus 1				Z ZK	4
01MAN Basic calculus (real	Calculus 1 analysis, functions of one real variable, differential calculus).					-
01MAN Basic calculus (real 01MANZ 01MAN2	Calculus 1 analysis, functions of one real variable, differential calculus). Calculus 1, exam	ce, operations o			ZK Z,ZK	4 8
01MAN Basic calculus (real 01MANZ 01MAN2 1. Continuation of di Real and complex po	Calculus 1 analysis, functions of one real variable, differential calculus). Calculus 1, exam Calculus 2 fferential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergen ower series, the Cauchy-Hadamard theorem, expansion of function into power series, summatice		n series, abs	Z olute and co	ZK Z,ZK onditional c	4 8 convergence 3.
01MAN Basic calculus (real 01MANZ 01MAN2 1. Continuation of di Real and complex po	Calculus 1 analysis, functions of one real variable, differential calculus). Calculus 1, exam Calculus 2 fferential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergen		n series, abs	Z olute and co	ZK Z,ZK onditional c	4 8 convergence 3.
01MAN Basic calculus (real 01MANZ 01MAN2 1. Continuation of di Real and complex po	Calculus 1 analysis, functions of one real variable, differential calculus). Calculus 1, exam Calculus 2 fferential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergen ower series, the Cauchy-Hadamard theorem, expansion of function into power series, summatice		n series, abs	Z olute and co	ZK Z,ZK onditional c	4 8 convergence 3.
01MAN Basic calculus (real 01MANZ 01MAN2 1. Continuation of dii Real and complex po (Riemann definition) 02MECH ntroduction to physic	Calculus 1 analysis, functions of one real variable, differential calculus). Calculus 1, exam Calculus 2 fferential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergen ower series, the Cauchy-Hadamard theorem, expansion of function into power series, summation, techniques of integration and application of integrals, Generalized Riemann integral Mechanics cs, physical quantities and units. Particle kinematics, basic types of motion and theirsuperposition	on of infinite serie	n series, abs ps. 4. Theory mics, one-dii	olute and cc of integrals:	ZK Z,ZK primitives, Z quations o	4 8 convergence 3. , definite integral 4 if motion, motion
01MAN Basic calculus (real 01MANZ 01MAN2 1. Continuation of dii Real and complex pr (Riemann definition) 02MECH ntroduction to physic in central force field,	Calculus 1 analysis, functions of one real variable, differential calculus). Calculus 1, exam Calculus 2 fferential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergen ower series, the Cauchy-Hadamard theorem, expansion of function into power series, summatic n, techniques of integration and application of integrals, Generalized Riemann integral Mechanics cs, physical quantities and units. Particle kinematics, basic types of motion and theirsuperposition forces innoninertial reference frames. Mechanics of system of free particles, two-body problem	on of infinite serie	n series, abs ps. 4. Theory mics, one-dii	olute and cc of integrals:	ZK Z,ZK primitives, Z quations o	4 8 convergence 3. , definite integral 4 if motion, motion
01MAN Basic calculus (real 01MANZ 01MAN2 1. Continuation of dii Real and complex pr (Riemann definition) 02MECH ntroduction to physic in central force field,	Calculus 1 analysis, functions of one real variable, differential calculus). Calculus 1, exam Calculus 2 fferential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergen ower series, the Cauchy-Hadamard theorem, expansion of function into power series, summation, techniques of integration and application of integrals, Generalized Riemann integral Mechanics cs, physical quantities and units. Particle kinematics, basic types of motion and theirsuperposition	on of infinite serie	n series, abs ps. 4. Theory mics, one-dii	olute and cc of integrals:	ZK Z,ZK primitives, Z quations o	4 8 convergence 3. , definite integral 4 if motion, motion amentals of
01MAN Basic calculus (real 01MANZ 01MAN2 1. Continuation of dii Real and complex pr (Riemann definition) 02MECH ntroduction to physic in central force field,	Calculus 1 analysis, functions of one real variable, differential calculus). Calculus 1, exam Calculus 2 fferential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergen ower series, the Cauchy-Hadamard theorem, expansion of function into power series, summatic n, techniques of integration and application of integrals, Generalized Riemann integral Mechanics cs, physical quantities and units. Particle kinematics, basic types of motion and theirsuperposition forces innoninertial reference frames. Mechanics of system of free particles, two-body problem	on of infinite serie	n series, abs ps. 4. Theory mics, one-dii	olute and cc of integrals: mensional e d body, rota	ZK Z,ZK primitives, Z quations o	4 8 convergence 3. , definite integral 4 if motion, motion
01MAN Basic calculus (real 01MANZ 01MAN2 1. Continuation of di Real and complex pr (Riemann definition) 02MECH ntroduction to physic in central force field, continuum mechanic 02MECHZ	Calculus 1 analysis, functions of one real variable, differential calculus). Calculus 1, exam Calculus 2 fferential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergen ower series, the Cauchy-Hadamard theorem, expansion of function into power series, summatic n, techniques of integration and application of integrals, Generalized Riemann integral Mechanics cs, physical quantities and units. Particle kinematics, basic types of motion and theirsuperposition forces innoninertial reference frames. Mechanics of system of free particles, two-body problem cs, elasticity, hydrodynamics. Sound.	on of infinite serie	n series, abs ps. 4. Theory mics, one-dii	olute and cc of integrals: mensional e d body, rota	ZK Z,ZK primitives, Z quations o tion. Funda	4 8 convergence 3. , definite integral 4 if motion, motion amentals of
01MAN Basic calculus (real 01MANZ 01MAN2 1. Continuation of di Real and complex po (Riemann definition) 02MECH ntroduction to physic in central force field, continuum mechanic 02MECHZ	Calculus 1 analysis, functions of one real variable, differential calculus). Calculus 1, exam Calculus 2 fferential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergen ower series, the Cauchy-Hadamard theorem, expansion of function into power series, summatic n, techniques of integration and application of integrals, Generalized Riemann integral Mechanics cs, physical quantities and units. Particle kinematics, basic types of motion and theirsuperpositie forces innoninertial reference frames. Mechanics of system of free particles, two-body problem cs, elasticity, hydrodynamics. Sound. Mechanics - Examination	on of infinite serie	n series, abs ps. 4. Theory mics, one-dii	olute and cc of integrals: mensional e d body, rota	ZK Z,ZK primitives, Z quations o tion. Funda	4 8 convergence 3. , definite integral 4 if motion, motion amentals of
01MAN Basic calculus (real 01MANZ 01MAN2 1. Continuation of di Real and complex po (Riemann definition) 02MECH ntroduction to physic in central force field, continuum mechanic 02MECHZ The content of the s	Calculus 1 analysis, functions of one real variable, differential calculus). Calculus 1, exam Calculus 2 fferential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergen ower series, the Cauchy-Hadamard theorem, expansion of function into power series, summatic n, techniques of integration and application of integrals, Generalized Riemann integral Mechanics cs, physical quantities and units. Particle kinematics, basic types of motion and theirsuperpositie forces innoninertial reference frames. Mechanics of system of free particles, two-body problem cs, elasticity, hydrodynamics. Sound. Mechanics - Examination ubject is the examination according to the plan of studies.	on of infinite serie	n series, abs ps. 4. Theory mics, one-dii	olute and co of integrals: mensional e d body, rota	ZK Z,ZK primitives, Z quations o tion. Funda ZK	4 8 convergence 3. , definite integral 4 if motion, motion amentals of 2
01MAN Basic calculus (real 01MANZ 01MAN2 1. Continuation of dii Real and complex po (Riemann definition) 02MECH ntroduction to physic in central force field, continuum mechanic 02MECHZ The content of the s 00PT 02TER	Calculus 1 analysis, functions of one real variable, differential calculus). Calculus 1, exam Calculus 2 fferential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergen ower series, the Cauchy-Hadamard theorem, expansion of function into power series, summatic n. techniques of integration and application of integrals, Generalized Riemann integral Mechanics cs, physical quantities and units. Particle kinematics, basic types of motion and theirsuperpositie forces innoninertial reference frames. Mechanics of system of free particles, two-body problem cs, elasticity, hydrodynamics. Sound. Mechanics - Examination ubject is the examination according to the plan of studies. Preparatory Week	on of infinite serie	n series, abs es. 4. Theory mics, one-diu shanics ofrigi	olute and cc of integrals: mensional e d body, rota	ZK Z,ZK primitives, Z quations o tion. Funda ZK Z Z,ZK	4 8 convergence 3. , definite integral 4 if motion, motion amentals of 2 2 4
01MAN Basic calculus (real 01MANZ 01MAN2 1. Continuation of dii Real and complex po (Riemann definition) 02MECH ntroduction to physic in central force field, continuum mechanic 02MECHZ The content of the s 00PT 02TER Thermal expansion of	Calculus 1 analysis, functions of one real variable, differential calculus). Calculus 1, exam Calculus 2 fferential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergen ower series, the Cauchy-Hadamard theorem, expansion of function into power series, summatic 1, techniques of integration and application of integrals, Generalized Riemann integral Mechanics cs, elasticity, hydrodynamics. Sound. Mechanics - Examination ubject is the examination according to the plan of studies. Preparatory Week Heat and Molecular Physics	on of infinite serie	n series, abs es. 4. Theory mics, one-diu shanics ofrigi	olute and cc of integrals: mensional e d body, rota	ZK Z,ZK primitives, Z quations o tion. Funda ZK Z,ZK inciple, ide	4 8 convergence 3. , definite integral 4 f motion, motion amentals of 2 2 4 al and real gas,
01MAN Basic calculus (real 01MANZ 01MAN2 1. Continuation of dii Real and complex po (Riemann definition) 02MECH ntroduction to physic in central force field, continuum mechanic 02MECHZ The content of the s 00PT 02TER Thermal expansion of	Calculus 1 analysis, functions of one real variable, differential calculus). Calculus 1, exam Calculus 2 fferential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergen ower series, the Cauchy-Hadamard theorem, expansion of function into power series, summatic 1, techniques of integration and application of integrals, Generalized Riemann integral Mechanics cs, physical quantities and units. Particle kinematics, basic types of motion and theirsuperpositie forces innoninertial reference frames. Mechanics of system of free particles, two-body problem cs, elasticity, hydrodynamics. Sound. Mechanics - Examination ubject is the examination according to the plan of studies. Preparatory Week Heat and Molecular Physics of materials, heat transfer; stationary and non-stationary heat conduction, heat transfer and pe	on of infinite serie	n series, abs es. 4. Theory mics, one-diu shanics ofrigi	olute and co of integrals: mensional e d body, rota	ZK Z,ZK primitives, Z quations o tion. Funda ZK Z,ZK inciple, ide	4 8 convergence 3. , definite integral 4 f motion, motion amentals of 2 2 4 al and real gas,
01MAN Basic calculus (real 01MANZ 01MAN2 1. Continuation of dii Real and complex po (Riemann definition) 02MECH ntroduction to physic in central force field, continuum mechanic 02MECHZ The content of the s 00PT 02TER Thermal expansion entropy; non-chemic 11UFPLN	Calculus 1 analysis, functions of one real variable, differential calculus). Calculus 1, exam Calculus 2 fferential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergen ower series, the Cauchy-Hadamard theorem, expansion of function into power series, summatic to the chanices Mechanics cs, physical quantities and units. Particle kinematics, basic types of motion and theirsuperpositie forces innoninertial reference frames. Mechanics of system of free particles, two-body problem cs, elasticity, hydrodynamics. Sound. Mechanics - Examination ubject is the examination according to the plan of studies. Preparatory Week Heat and Molecular Physics of materials, heat transfer; stationary and non-stationary heat conduction, heat transfer and pe ral systems: dielectric and magnetic materials; Maxwell relations and thermodynamic potentials	on of infinite serie	n series, abs es. 4. Theory mics, one-diu shanics ofrigi	olute and cc of integrals: mensional e d body, rota	ZK Z,ZK primitives, Z quations o tion. Funda ZK Z,ZK inciple, ide tion,equip	4 8 convergence 3. , definite integral 4 if motion, motion amentals of 2 2 4 al and real gas, artition theorem.
01MAN Basic calculus (real 01MANZ 01MAN2 1. Continuation of dii Real and complex po (Riemann definition) 02MECH ntroduction to physic in central force field, continuum mechanic 02MECHZ The content of the s 00PT 02TER Thermal expansion entropy; non-chemic 11UFPLN	Calculus 1 analysis, functions of one real variable, differential calculus). Calculus 1, exam Calculus 2 fferential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergen ower series, the Cauchy-Hadamard theorem, expansion of function into power series, summatic to the chanices Mechanics cs, physical quantities and units. Particle kinematics, basic types of motion and theirsuperpositie forces innoninertial reference frames. Mechanics of system of free particles, two-body problem cs, elasticity, hydrodynamics. Sound. Mechanics - Examination ubject is the examination according to the plan of studies. Preparatory Week Heat and Molecular Physics of materials, heat transfer; stationary and non-stationary heat conduction, heat transfer and pe ral systems: dielectric and magnetic materials; Maxwell relations and thermodynamic potentials Introduction to Solid State Physics	on of infinite serie	n series, abs es. 4. Theory mics, one-diu shanics ofrigi	olute and cc of integrals: mensional e d body, rota	ZK Z,ZK primitives, Z quations o tion. Funda ZK Z,ZK inciple, ide tion,equip	4 8 convergence 3. , definite integral 4 if motion, motion amentals of 2 2 4 al and real gas, artition theorem.
01MAN Basic calculus (real 01MANZ 01MAN2 1. Continuation of dii Real and complex po (Riemann definition) 02MECH ntroduction to physic in central force field, continuum mechanic 02MECHZ The content of the s 00PT 02TER Thermal expansion entropy; non-chemic 11UFPLN The purpose of this 18ZPRO	Calculus 1 analysis, functions of one real variable, differential calculus). Calculus 1, exam Calculus 2 fferential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergen ower series, the Cauchy-Hadamard theorem, expansion of function into power series, summation, techniques of integration and application of integrals, Generalized Riemann integral Mechanics cs, physical quantities and units. Particle kinematics, basic types of motion and theirsuperpositie forces innoninertial reference frames. Mechanics of system of free particles, two-body problem cs, elasticity, hydrodynamics. Sound. Mechanics - Examination ubject is the examination according to the plan of studies. Preparatory Week Heat and Molecular Physics of materials, heat transfer; stationary and non-stationary heat conduction, heat transfer and pe ral systems: dielectric and magnetic materials; Maxwell relations and thermodynamic potentials Introduction to Solid State Physics lecture is to introduce the undergraduate students to the study of the solid state physics.	on of infinite serie on. Particle dyna n, collisions. Med netration; 1st an kinetic theory: N	n series, abs es. 4. Theory mics, one-diu chanics ofrigi d 2nd thermo laxwell's velo	d body, rota	ZK Z,ZK primitives, Z quations o tion. Funda ZK Z,ZK inciple, ide tition,equipa ZK Z	4 8 convergence 3. , definite integral 4 if motion, motion amentals of 2 2 4 al and real gas, artition theorem. 2 4

Code of the group: BSPFIIPL2 Name of the group: BS P_FIB IPL 2nd year

Name of the group. Bot _1 ID if E 2nd yea

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:

Předmět 02TEF1 lze absolvovat až po absolvování předmětu 02MECHZ. Předmět 02TEF2 lze absolvovat až po absolvování předmětů 02ELMA a 02TEF1.

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
11GNU	GNU Programming Martin Dráb Martin Dráb (Gar.)	KZ	4	2P+2C	L	PS
01ANB3	Calculus B 3 Miroslav Kolá , Milan Krbálek Miroslav Kolá Milan Krbálek (Gar.)	Z,ZK	8	4P+4C		PS
01ANB4	Calculus B 4 Ji í Mikyška, Miroslav Kolá , Milan Krbálek Milan Krbálek Milan Krbálek (Gar.)	Z,ZK	6	2P+4C		PS
12NME1	Numerical Methods 1 Pavel Váchal Pavel Váchal (Gar.)	Z,ZK	4	2+2	L	PS
11SFIPL	Seminar on Solid State Physics Ladislav Kalvoda Ladislav Kalvoda (Gar.)	KZ	2	1+1		PS
11SPLA	Structure of Solid State Ivo Kraus, Petr Kolenko Petr Kolenko (Gar.)	Z,ZK	4	2P+2C	L	PS

02TEF1	Theoretical Physics 1 Petr Novotný Petr Novotný Igor Jex (Gar.)	Z,ZK	4	2+2	Z	PS
)2TEF2	Theoretical Physics 2 Filip Petrásek, Petr Novotný Josef Schmidt Petr Novotný (Gar.)	Z,ZK	4	2+2	L	PS
2TSFA	Thermodynamics and Statistical Physics Igor Jex, Jaroslav Novotný Antonín Hoskovec Igor Jex (Gar.)	Z,ZK	4	2+2	L	PS
02VOAF	Waves, Optics and Atomic Physics Josef Schmidt, Petr Novotný Jan Vysoký Ji í Tolar (Gar.)	Z,ZK	6	4+2	Z	PS
haractoristics of t	ne courses of this group of Study Plan: Code=BSPFIIPL2 Nam		l 2nd ve	ar		
	SNU Programming	e=d3 F_FID IF	L Zhù ye		KZ	4
	b introduce students into the Linux system environment and therein used GNU utilities	s and programming t	ools to such	1		•
nese tools for creating sc	ripts and programs for processing acquired or simulated data for their experiments in	physics with the use	of the facul	lty's Hyperion	l cluster (ho	wever the
earned skills could of cou	rse be applied to any Linux system).					
)1ANB3 C	Calculus B 3			Z	,ZK	8
1	nd series - convergence range, criteria of uniform convergence, continuity, limit, differ	entiation and integra	ation of func	1	·	es, Series
	em. 2. Ordinary differential equations - equations of first order (method of integration f	-			-	
	on) and equations of higher order (fundamental system, reduction of order, variation of	· •	•			0
	ation). 3. Metric spaces - metric, norm, scalar product, neighborhood, interior and ext				•	•
	ace, Hilbert spaces. Orthogonal polynomials. Complete orthogonal systems. 4. Fourier	-			-	
	nce. 5. Differential calculus of functions of several variables - limit, continuity, partial ar	-			-	
e e	terms of vector analysis, Jacobi matrix. 6. Functions defined implicitly by one or sever		, gradien	,		
				7	71/	6
1	Calculus B 4		,	1	,ZK	, 6
	ccí více prom nných a funkcionálních vektor . [2] Funkce zadané implicitn . [3] Taylo					
	soustavy sou adnic. [5] Lokální, vázané a globální extrémy funkce více prom nných.	•••••				
	e prom nných - Riemann v a Lebesgue v integrál, základní vlastnosti, Fubiniova v	ta, v ta o substituci.	Leviho a Le	ebesgueova v	ta. Limita,	spojitost a
	arametru. [8] Integrály po k ivkách a plochách. Integrální v ty.					
2NME1 N	Jumerical Methods 1			Z	,ZK	4
nere are explained the ba	asic principles of numerical mathematics important for numerical solving of problems i	mportant for physics	and techno	logy. Method	s for solutio	n of tasks
nportant for physicists (o	rdinary differential equations, random numbers) are included in addition to the basic r	umerical methods. I	ntegrated co	omputational	environmer	nt MATLAB
sed as a principle progra	mming language as a demonstration tool. The seminars are held in computer laborate	ory.				
1SFIPL S	Seminar on Solid State Physics				κz	2
	•					
o following themes: crysta actor, extinction, practical nd thermal oscillations, q	nar and ?SSS? software features. 2.Module "bravais" - crystal structure and X-ray diff al lattice versus crystal structure, primitive cell, elementary cell, lattice plane, reciproca structural analysis 4.Module "laue" - Diffraction on perfect and imperfect crystals 5.Simu uasi crystals 6."born" module - dynamics of crystalline grid in 1D ? theory 7.Simulatic omentum transport infinite chain, chain of finite length boundary conditions wave pac	al grid, Laue and Bra Ilations: influence of s ons: planar waves, tra	agg conditio structural dis aveling and	tions of diffract n, atomic sca sorder on diffr standing way	ctive phenor attering facto action patte ves, normal	mena relato or, structura rn, atomiza modes,
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Credits in the group: 0 Note on the group:

Zkoušku z 01RMAF lze skládat až po složení všech zkoušek z Matematické analýzy a Lineární algebry.

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members)	Completion	Credits	Scope	Semester	Role
	Tutors, authors and guarantors (gar.)					
1APLG	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	PS
1BPFI1	Bachelor Thesis 1 Ladislav Kalvoda Ladislav Kalvoda (Gar.)	Z	5		Z	PS
1BPFI2	Bachelor Thesis 2 Ladislav Kalvoda Ladislav Kalvoda (Gar.)	Z	10		L	PS
1DAPL	Diffraction Analysis of Solid State Nikolaj Ganev, Ji í apek Nikolaj Ganev (Gar.)	ZK	2	2P+0C	Z	PS
11MAPL	Solid State Physics – Applications and Analytic Methods Irena Kratochvílová Irena Kratochvílová (Gar.)	Z,ZK	4	2P+2C	L	PS
I1KFPL	Continuum in Solid State Physics Hanuš Seiner Hanuš Seiner (Gar.)	ZK	3	2P+0C	L	PS
)2KM1	Quantum Mechanics 1 Martin Štefa ák Martin Štefa ák Martin Štefa ák (Gar.)	Z,ZK	6	4P+2C	Z	PS
02KM2	Quantum Mechanics 2 Martin Štefa ák Martin Štefa ák Martin Štefa ák (Gar.)	Z,ZK	6	4P+2C	L	PS
01PRST	Probability and Statistics Tomáš Hobza Tomáš Hobza Tomáš Hobza (Gar.)	Z,ZK	4	3+1	Z	PS
01RMAF	Equations of Mathematical Physics	Z,ZK	7	4P+2C		PS
11BSEM	Václav Klika Václav Klika Václav Klika (Gar.) Bachelor Seminar Ladislav Kalvoda, Radka Mika Havlíková Ladislav Kalvoda Ladislav Kalvoda (Gar.)	Z	1	0P+2C	L	PS
11CFPL	Introduction into the Chemistry and Physics of Polymer Materials Kate ina Aubrechtová Dragounová, Monika Ku eráková Kate ina Aubrechtová Dragounová (Gar.)	ZK	2	2+0	L	PS
11ZFPL	Basic to Solid State Physics Ladislav Kalvoda, Eva Mihóková Eva Mihóková Ladislav Kalvoda (Gar.)	KZ	2	26P+0C	Z	PS
11ZSKL	Introduction to Condensed Matter Simulations Ladislav Kalvoda, Jan Drahokoupil Jan Drahokoupil (Gar.)	КZ	2	1P+1C	L	PS
alone will provide. The applic vibrations, and selection rule	n may occur. Therefore, the main purpose of this course is to describe the methods by ation of these methods is illustrated by an example of molecular orbitals, inner orbitals is for optical absorption transitions.				normal modes	of molec
	chelor Thesis 1 ent and under the supervision of the supervisor, the student individually works on the a	assigned topic for	2 comostor		Ζ	5
	chelor Thesis 2	assigned topic for	2 Semester	5.	Z	10
	ent and under the supervision of the supervisor, the student individually works on the a fraction Analysis of Solid State	assigned topic for	2 semester		ZK	2
he purpose of this course is	s to introduce the undergraduate students the experimental methods for studying real lid State Physics – Applications and Analytic Methods	structure of solids	8.		Z,ZK	4
The subject describes the ele	ectrical and magnetic properties of metals and their alloys including superconductivity.	. Furthermore, ele	ectrical and o		·	
1	and methods of their study are characterized. ntinuum in Solid State Physics				ZK	3
	nts to the basics of the application of the theoretical concept of continuum to the desc	ription of the prop	erties of so	1		trated on
02KM1 Qu	antum Mechanics 1				Z,ZK	6
	es the birth of quantum mechanics and description of one particle and more particles b observable quantities by operators in the Hilbert space and calculation of their spectr	•	Hilbert space	ce as well as	s its time evolut	ion. Besi
	antum Mechanics 2 is the introduction to quantum mechanics with more general formalism of quantum the	ory approximate	methods an		Z,ZK	6 zes the
erminology and methods use	ed in various applications of quantum mechanics and prepares the students for an effect					
ormulations of quantum field	bability and Statistics				Z,ZK	4
is a basic course of probab	ility theory and mathematical statistics. The probability theory is build gradually begin	•		on and conti	inuing till the K	olmogorc
	dom variable, distribution function of random variable and characteristics of random v				ns are stated a	and prove
	e basic methods of mathematical statistics such as estimation of distribution paramet uations of Mathematical Physics	ers and hypothes	is testing af		Z,ZK	7
	solving integral equations, theory of generalized functions, classification of partial diffe	erential equations	, theory of ir		· I	
	(boundary value problem for eliptic PDE, mixed boundary problem for eliptic PDE).			1		
1	chelor Seminar		and the f-		Z	1 Nor'o doo
-	r, students familiarize themselves with the general principles of publishing and presenti econd part is designed as a practical training for the defence of the bachelor's degree	-				-
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student's performance.

	Interchantion into the Ohn 111 DI 111 CD 1			1	71/	
11CFPL Basic syntheses of poly	Introduction into the Chemistry and Physics of Polymer Materials mer materials, polymer characterization and processing. Properties of polymer matrix o	n macro-, micro- na	nometric ar	d molecula	ZK	2 the solution of
	perties - processing, practical examples of solutions of chosen problems. The choice of p					
11ZFPL	Basic to Solid State Physics				KZ	2
	ntal properties of solids following the regular long distance ordering of atoms in a crysta			-		
	crystals and their properties are defined. The model of crystalline lattice dynamics in harm ic potential of the crystal lattice is introduced and its relation to the following model desc					
	d. The special consequences of band approach to the physical properties of solids are e				-	
	menological basis of physical properties of crystalline solids				,	
11ZSKL	Introduction to Condensed Matter Simulations				KZ	2
	condensed matter becomes an important tool in developing new materials and technolo		-			-
l	is transferred from real to 'virtual' computer lab. During the course, students will be introdun nodels, and will test their knowledge on practical examples.	iced to basic compute	allonal meth	bas and pro	cedures bas	sed on classical
Name of the b	lock: Compulsory elective courses					
	er of credits of the block: 0					
The role of the						
Code of the ar	oup: BSSPOLVEDY					
•	•					
	roup: BS - Social Sciences					
•	credits in the group:					
•	courses in the group: In this group you have to com	plete at leas	t 1 cou	se		
Credits in the						
Note on the gr	Only one of these co	ourses is obliga	atory.			
	Name of the course / Name of the group of courses					
Code	(in case of groups of courses the list of codes of their members)	Completion	Credits	Scope	Semeste	er Role
	Tutors, authors and guarantors (gar.)					
00EKOT	Economy in Technology	z	1	2+0		PV
	Jana Ková ová			-		
00ETV	Ethics of Science and Technology Jakub Hají ek Jana Ková ová	Z	1	0+2	L	PV
00RET	Rhetoric	Z	1	0+2		PV
	Jana Ková ová Jana Ková ová Introduction to Law					
00UPRA	Martin ech Jana Ková ová	Z	1	0+2		PV
00UPSY	Introduction to Psychology	Z	1	0+2		PV
	Jakub Hají ek Jana Ková ová					
Characteristics of	the courses of this group of Study Plan: Code=BSSPOLVEDY N	Name=BS - Soc	ial Scien	ces		
00EKOT	Economy in Technology				Z	1
	the basics of micro- and macroeconomics.					
00ETV	Ethics of Science and Technology				Z	1
00RET	Rhetoric) Rhetoric) Represent and voice techniques and on the rules of correct pronouncia	ation. The course is a	also devoted	to the com	Z	1 Jublic speech
	bal aspects. Stylistics exercises, strategies for coping with stage-fright and a short excur					-
00UPRA	Introduction to Law				Z	1
00UPSY	Introduction to Psychology				Z	1
- · · · ·						
Code of the gr	oup: BSPJAZYKYZK					
•	•					
Name of the g	oup: BSPJAZYKYZK roup: BS P languages 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:

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
04XAMZK	English for Intermediate Students Examination	ZK	4		Z	PV
04XAPZK	English for Advanced Students Examination	ZK	4		Z	PV
04XCESZZK	Czech for Foreigners – Beginners - Examination Jana Ková ová, Slav na Brownová	ZK	4		Z	PV
04XCESMZK	Czech for Intermediate Students Examination Jana Ková ová Jana Ková ová Jana Ková ová (Gar.)	ZK	4		Z	PV

04XCESPZK	Czech for Foreign Students - Advanced Examination Jana Ková ová Jana Ková ová (Gar.)	ZK	4	Z	PV
04XFMZK	French for Intermediate Students Examination	ZK	4	Z	PV
04XFPZK	French for Advanced Students Examination	ZK	4	Z	PV
04XFZZK	French for Beginners Examination V ra Šlechtová	ZK	3	L	PV
04XNMZK	German for Intermediate Students Examination	ZK	4	Z	PV
04XNPZK	German for Advanced Students Examination	ZK	4	Z	PV
04XRMZK	Russian for Intermediate Students Examination	ZK	4	Z	PV
04XRPZK	Russian for Advanced Students Examination	ZK	4	Z	PV
04XRZZK	Russian for Beginners Examination V ra Šlechtová	ZK	3	L	PV
04XSMZK	Spanish for Intermediate Students Examination	ZK	4	Z	PV
04XSPZK	Spanish for Advanced Students Examination	ZK	4	Z	PV
04XSZZK	Spanish for Beginners Examination	ZK	3	L	PV
	i la clocilitata				
Characteristics of t		Name=BS P la	anguages		_
1	he courses of this group of Study Plan: Code=BSPJAZYKYZK I	Name=BS P la	anguages	ZK	4
04XAMZK E	he courses of this group of Study Plan: Code=BSPJAZYKYZK I				•
04XAMZK End to be content is the	he courses of this group of Study Plan: Code=BSPJAZYKYZK I English for Intermediate Students Examination	M3 courses and co	onsists of two pa	rts - written (100 min	•
04XAMZK E The course content is the (20-30 min). The student i	he courses of this group of Study Plan: Code=BSPJAZYKYZK I English for Intermediate Students Examination examination as given by the study plan. The examination covers the AM1, AM2, and A	M3 courses and co	onsists of two pa	rts - written (100 min	
04XAMZK E The course content is the (20-30 min). The student i 04XAPZK E	he courses of this group of Study Plan: Code=BSPJAZYKYZK I English for Intermediate Students Examination examination as given by the study plan. The examination covers the AM1, AM2, and A s expected to master the AM syllabus and demonstrate the ability to apply their knowle	M3 courses and co edge gained in the t	onsists of two pa three English co	urses.) and oral
04XAMZK E The course content is the (20-30 min). The student i 04XAPZK E The course content is the	he courses of this group of Study Plan: Code=BSPJAZYKYZK I English for Intermediate Students Examination examination as given by the study plan. The examination covers the AM1, AM2, and A s expected to master the AM syllabus and demonstrate the ability to apply their knowle English for Advanced Students Examination	M3 courses and co edge gained in the t ring the AP3 syllab	onsists of two pa three English co us and the ability	rts - written (100 min urses. ZK y to apply their knowle) and oral 4 edge obtain
04XAMZK E The course content is the (20-30 min). The student i 04XAPZK E The course content is the in the three AP courses. T	he courses of this group of Study Plan: Code=BSPJAZYKYZK I English for Intermediate Students Examination examination as given by the study plan. The examination covers the AM1, AM2, and A s expected to master the AM syllabus and demonstrate the ability to apply their knowle English for Advanced Students Examination examination as given by the study plan. The student is supposed to demonstrate maste	M3 courses and co edge gained in the t ring the AP3 syllab	onsists of two pa three English co us and the ability	rts - written (100 min urses. ZK y to apply their knowle) and oral 4 edge obtain
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04XAMZK E The course content is the (20-30 min). The student i 04XAPZK E The course content is the in the three AP courses. T 04XCESZZK C The course content is the	he courses of this group of Study Plan: Code=BSPJAZYKYZK I English for Intermediate Students Examination examination as given by the study plan. The examination covers the AM1, AM2, and A s expected to master the AM syllabus and demonstrate the ability to apply their knowle English for Advanced Students Examination examination as given by the study plan. The student is supposed to demonstrate maste the examination consists of 2 parts - written (110 min) and oral (30 min) and includes a Czech for Foreigners – Beginners - Examination	M3 courses and co edge gained in the t ring the AP3 syllab Iso oral presentation ral part covers all th	onsists of two pa three English co us and the ability on of a topic fron	rts - written (100 min urses. ZK y to apply their knowle n the student's field o ZK) and oral 4 edge obtain f study. 4
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04XAMZK E The course content is the (20-30 min). The student i 04XAPZK 104XAPZK E The course content is the in the three AP courses. T 04XCESZZK 04XCESZZK C 04XCESZZK C 04XCESMZK C 04XCESMZK C 04XCESMZK C 04XCESMZK C 04XCESMZK C 04XCESPZK C 04XCESPZK C 04XCESPZK C 04XCESPZK C 04XCESPZK C	he courses of this group of Study Plan: Code=BSPJAZYKYZK I English for Intermediate Students Examination examination as given by the study plan. The examination covers the AM1, AM2, and A s expected to master the AM syllabus and demonstrate the ability to apply their knowle English for Advanced Students Examination examination as given by the study plan. The student is supposed to demonstrate maste he examination consists of 2 parts - written (110 min) and oral (30 min) and includes a Czech for Foreigners – Beginners - Examination examination as given by the study plan. The examination consisting of a written and or ssful completion of all three courses. Detailed information is to be obtained from the tea Czech for Intermediate Students Examination examination as given by the study plan. The examination consisting of a written and or completion of the 3 courses. Detailed information is to be obtained from the teacher. Czech for Foreign Students - Advanced Examination examination as given by the study plan. The examination	M3 courses and co edge gained in the t ring the AP3 syllab ilso oral presentation ral part covers all th acher.	onsists of two pa three English co ous and the ability on of a topic from ne topics of the C	rts - written (100 min urses. ZK y to apply their knowle in the student's field of ZK V4XCESZ1,2,3 course ZK CESM1,2,3 courses a ZK) and oral 4 edge obtain of study. 4 es and can 4 and can only 4

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 is organized according to Examination Instructions, a document available on the web. Assessment of the presentation is included into the examination grading. 04XFZZK French for Beginners Examination ZK 3 The content is the examination as given by the study plan. The course is terminated with an examination consisting of oral and written part. The examination is ruled by the document Instruction for examination. Its content covers the levels FZ1 - FZ5. 04XNMZK German for Intermediate Students Examination ZK 4 The course content is the examination as given by the study plan. The whole German for Intermediate Students Course is completed by an examination consisting of two parts - written and oral, which cover the courses NM1 - NM3. The oral part follows after passing the written part successfully and after obtaining the 04NM3 assessment. More detailed information
04XFZZK French for Beginners Examination ZK 3 The content is the examination as given by the study plan. The course is terminated with an examination consisting of oral and written part. The examination is ruled by the document Instruction for examination. Its content covers the levels FZ1 - FZ5. 04XNMZK German for Intermediate Students Examination ZK 4 The course content is the examination as given by the study plan. The whole German for Intermediate Students Course is completed by an examination consisting of two parts - written
The content is the examination as given by the study plan. The course is terminated with an examination consisting of oral and written part. The examination is ruled by the document Instruction for examination. Its content covers the levels FZ1 - FZ5. 04XNMZK German for Intermediate Students Examination The course content is the examination as given by the study plan. The whole German for Intermediate Students Course is completed by an examination consisting of two parts - written
Instruction for examination. Its content covers the levels FZ1 - FZ5. 04XNMZK German for Intermediate Students Examination ZK 4 The course content is the examination as given by the study plan. The whole German for Intermediate Students Course is completed by an examination consisting of two parts - written
04XNMZK German for Intermediate Students Examination ZK 4 The course content is the examination as given by the study plan. The whole German for Intermediate Students Course is completed by an examination consisting of two parts - written
The course content is the examination as given by the study plan. The whole German for Intermediate Students Course is completed by an examination consisting of two parts - written
and oral, which cover the courses NM1 - NM3. The oral part follows after passing the written part successfully and after obtaining the 04NM3 assessment. More detailed information
is to be obtained from the teacher.
04XNPZK German for Advanced Students Examination ZK 4
The course content is the examination as given by the study plan. The whole German for Advanced Students Course is completed by an examination consisting of two parts - written
and oral, which cover the courses NP1 - NP3. The oral part follows after passing the written part successfully and after obtaining the 04NP3 ungraded assessment. More detailed
information is to be obtained from the teacher.
04XRMZK Russian for Intermediate Students Examination ZK 4
The course content is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowledge and skills acquired in RM1
- RM3. Students are eligible for the oral examination only after a prior pass in RM3 and a successful written examination. Students are given instructions by the teacher.
04XRPZK Russian for Advanced Students Examination ZK 4
The course content is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowledge and skills acquired in RP1
- RP3. Students are eligible for the oral examination only after a prior pass in RP3 and a successful written examination. Students are given instructions by the teacher.
04XRZZK Russian for Beginners Examination ZK 3
The course content is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowledge and skills acquired in RZ1
- RZ5. Students are eligible for the oral examination only after a prior pass in RZ5 and a successful written examination. Students are given instructions by the teacher.
04XSMZK Spanish for Intermediate Students Examination ZK 4
The course content is the examination as given by the study plan. SMZK examination consists of two parts - written and oral; to be eligible for the written part, students will have obtained
non-graded assessment for course SM3. Oral examination follows the written part.
04XSPZK Spanish for Advanced Students Examination ZK 4
The course content is the examination as given by the study plan. Examination SPZK consists of two parts, namely oral and written. The prerequisite for admission to oral part is having

consists of a written and oral part and is organized according to Examination Instructions, a document available on the web.

	ne examination as given by the study plan. Examination SPZK consists of two parts, namely oral and written. The prerequisite	for admission to o	ral part is havin
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.		
04XSZZK	Spanish for Beginners Examination	ZK	3
The course content is t	e examination as given by the study plan. Examination consists of two parts - written and oral. Student can register for oral e	examination only i	f 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: BSPFIIPLV Name of the group: BS P_FIB IPL Optional courses Requirement credits in the group: Requirement courses in the group: Credits in the group: 0

Note on the group:

Zápis předmětu 15CH2 podmíněn získáním zápočtu z předmětu 15CH1.

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
11ANEL	Linear Circuit Analysis Pavel Jiroušek Pavel Jiroušek (Gar.)	Z,ZK	4	4	Z	V
02AMS	Atomic and Molecular Spectroscopy Svatopluk Civiš Svatopluk Civiš Svatopluk Civiš (Gar.)	Z,ZK	4	2+2	Z	V
02DEF2	History of Physics 2 Igor Jex Miroslav Myška Igor Jex (Gar.)	Z	2	2+0	L	V
14ELM	Electron Microscopy Miroslav Karlík Miroslav Karlík (Gar.)	KZ	2	2P+0C		V
02EXF	Experimental Physics Barbara Antonina Trzeciak, Jaroslav Adam, Jaroslava Óbertová, Katarína K ížková Gajdošová Jaroslava Óbertová Katarína K ížková Gajdošová (Gar.)	ZK	2	2P+0C	Z	V
02PRA1	Experimental Laboratory 1 Barbara Antonina Trzeciak, Katarína K ížková Gajdošová, Libor Škoda, Jaroslav Biel ík Jaroslav Biel ík 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
11GPL	GNU Plot Martin Dráb Martin Dráb Martin Dráb (Gar.)	Z	2	2C	Z	V
04AKS	English Conversation Jana Ková ová Jana Ková ová (Gar.)	Z	1	0+2	L	V
00MAM1	Essentials of High School Course 1 David Be Martin Stefa ák	Z	1	0+1		V
00MAM2	Essentials of High School Math Course 2 Lukáš Heriban Severin Pošta Lukáš Heriban (Gar.)	Z	1	0+1		V
11MIK	Logical Circuits and Microprocessors Pavel Jiroušek, Petr Levinský Pavel Jiroušek Pavel Jiroušek (Gar.)	Z,ZK	4	4	L	V
12MOF	Molecular Physics Jan Proška, Martin Michl Martin Michl Jan Proška (Gar.)	ZK	2	2+0	L	V
12NT	Nanotechnology Jan Proška, Eduard Hulicius Jan Proška Eduard Hulicius (Gar.)	ZK	2	2+0	Z	V
15CH1	General Chemistry 1 Ond ej Holas, Petr Distler, Václav uba Petr Distler Petr Distler (Gar.)	Z	3	2+1	Z	V
15CH2	General Chemistry 2 Ond ej Holas, Petr Distler, Václav uba Petr Distler Petr Distler (Gar.)	Z,ZK	3	2+1	L	V
12PAS	Computer Algebra Systems Milan Ši or Milan Ši or Milan Ši or (Gar.)	Z	2	1P+1C	Z	V
18PMTL	Programming in MATLAB	KZ	4	4C	Z	V
18PPY1	Quang Van Tran, Jaromír Kukal Quang Van Tran Jaromír Kukal (Gar.) Programming in Python 1 Jakub Klinkovský, Matej Mojzeš Jakub Klinkovský Jakub Klinkovský (Gar.)	Z	2	2C	L	V
18PPY2	Programming in Python 2 Jakub Klinkovský Jakub Klinkovský (Gar.)	Z	2	2S	z	V
18PPY3	Programming in Python 3 Rudolf Pecinovský Jakub Klinkovský Jakub Klinkovský (Gar.)	Z	2	2C	L	V
02SMF	Seminar of Mathematical Physics Martin Štefa ák Ladislav Hlavatý (Gar.)	Z	2	0+2	Z	V
11SPS	Seminar of computer simulations Jan Drahokoupil Jan Drahokoupil (Gar.)	Z	2	2C	L	V
11SFBM	Structure and Function of Biomolecules Petr Kolenko, Tomáš Kova Petr Kolenko Petr Kolenko (Gar.)	Z,ZK	3	2+1	Z	V
TV-1	Physical Education	Z	1		Z	V
TV-2	Physical Education	Z	1		L	V
TV-3	Physical education	Z	1	0+2	Z	V
TV-4	Physical education	Z	1	0+2	L	V
02TJNS	Transport Phenomena / Nonequilibrium Systems Igor Jex Martin Štefa ák Igor Jex (Gar.)	KZ	2	2+0	L	V

	Creating Electronic Documents Aleš Materna Aleš Materna Aleš Materna (Gar.)	Z	2	26C		V
12UFN	Introduction to Photonics and Nanostructures	KZ	3	2P+1C	L	V
01UP1	Jan Proška, Ivan Richter, Pavel Kwiecien Ivan Richter Ivan Richter (Gar.) Introduction to Probability 1 Jan Vybíral Jan Vybíral (Gar.)	Z,ZK	3	1P+1C		V
01UP2	Introduction to Probability 2 Milan Krbálek Milan Krbálek Milan Krbálek (Gar.)	Z,ZK	3	1P+1C		V
12UNXAP	Introduction to UNIX Milan Kucha ik Milan Kucha ik Milan Kucha ik (Gar.)	Z	2	1P+1C	L	V
12UVP	Introduction to Scientific Computing	Z	2	1P+1C	L	V
12VKT	Milan Ši or Milan Ši or Milan Ši or (Gar.) Vacuum Technology Richard Švejkar Vojt ch Petrá ek Vojt ch Petrá ek (Gar.)	KZ	4	2P+2L	Z	V
18ZALG	Richard Svejkar Vojt ch Petra ek Vojt ch Petra ek (Gal.) 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
12ZEL1	Basic Electronics 1 Jaroslav Pavel Jaroslav Pavel (Gar.)	Z,ZK	3	2+1	Z	V
12ZFS	Fundamentals of Photonic Structures	Z,ZK	2	2P	L	V
02ZM1	Foundations of Physical Measurements 1 Libor Škoda, Solangel Rojas Torres, Petr Chaloupka Martin Štefa ák Petr Chaloupka (Gar.)	ZK	2	2P+0C	Z	v
02ZM2	Foundations of Physical Measurements 2 Petr Chaloupka Martin Štefa ák Petr Chaloupka (Gar.)	KZ	4	0P+4L	L	V
12ZFP	Principles of Plasma Physics Martin Jirka, Ji í Limpouch Martin Jirka Ji í Limpouch (Gar.)	Z,ZK	4	3+1	L	V
12ZAOP	Fundamentals of Optics Ivan Richter, Pavel Kwiecien Ivan Richter Ivan Richter (Gar.)	Z,ZK	2	2+0	Z	V
Characteristics of the	e courses of this group of Study Plan: Code=BSPFIIPLV Name=	BS P FIB IP	L Option	al course	es	1
1	near Circuit Analysis	<u> </u>			,ZK	4
	on to the linear electronics for physicists. In the first part it describes basic methods of li	near circuit analy	/sis. It is esp	pecially orien	ted to the une	derstanding
	f analysis. The second part gives a short list of most commonly used circuits in experime	ental equipment.				
	tomic and Molecular Spectroscopy			Z	,ZK	4
	omic and molecular spectroscopy.					
	istory of Physics 2				Z	2
						_
	echanics after Newton, Bernoulli's, Euler, Lagrange. Historical development of optics, co			-	-	tism -
electrostatics, galvanism, el	lectrodynamics and electromagnetism, Faraday and Maxwell. Thermodynamics and its I	aws, statistical p	hysics, Bolt	zmann. The l	birth of mode	tism - rn quantum
electrostatics, galvanism, el and relativistic physics, Plar	lectrodynamics and electromagnetism, Faraday and Maxwell. Thermodynamics and its I nck and Einstein. Discovery of radioaktivity, structure of atom, atomic nucleus, Rutherfor	aws, statistical p	hysics, Bolt	zmann. The l	birth of mode	tism - rn quantum
electrostatics, galvanism, el and relativistic physics, Plar standard model. The conce	lectrodynamics and electromagnetism, Faraday and Maxwell. Thermodynamics and its I nck and Einstein. Discovery of radioaktivity, structure of atom, atomic nucleus, Rutherfor pt of Nature and Universe of today.	aws, statistical p	hysics, Bolt	zmann. The l ear energy, E	birth of mode Elementary pa	tism - rn quantum articles,
electrostatics, galvanism, el and relativistic physics, Plar standard model. The concel 14ELM El	lectrodynamics and electromagnetism, Faraday and Maxwell. Thermodynamics and its I nck and Einstein. Discovery of radioaktivity, structure of atom, atomic nucleus, Rutherfor pt of Nature and Universe of today. ectron Microscopy	aws, statistical p d and Bohr. The	hysics, Bolt way to nucl	zmann. The l ear energy, E	birth of mode Elementary pa	tism - rn quantum articles, 2
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12MOF	Molecular Physics	ZK	2
	mic molecules and molecular matter, and on structure-to-physical properties relations. Methods of molecular structure deter	1	
12NT	Nanotechnology		2 fundamenta of
	students mainly to modern technological methods of preparation of semiconductor, metal and dielectric nanostructures. Phys IBE, MOVPE, EBL, sol-gel and colloidal solution) will be explained. Substantive attention will be devoted to epitaxial technological and the second second second second second second		
	on. Particular emphasis will be focused on detail characterization of "in situ" and "ex situ" techniques, their applications for he	•	
	ed as well. Some supportive technical methods - lithography, diffusion, evaporation, ion implantation, contact and dielectric la		
as well as soldering and	l encasement.		
15CH1	General Chemistry 1	Z	3
	cepts, quantities and units used in chemistry are introduced in the course General Chemistry I. Their significance and practic	cal use are illustra	ted by examples
solved in exercises.		774	0
15CH2	General Chemistry 2 nuation of the course General chemistry I. The main attention is paid to general principles governing chemical processes. Usi	Z,ZK	3
	ciples is not restricted only to chemical processes is documented. The significance and practical use of explained principles	• .	
in exercises.			
12PAS	Computer Algebra Systems	Z	2
Practically oriented intro	duction to computer algebra systems (CAS): their main characteristics, ways and means of using them. Constituent part is n	ealized in comput	er classrooms:
students acquire basic s	skills with CAS by solving relatively simple and basic tasks from mathematics and physics.		
18PMTL	Programming in MATLAB	KZ	4
-	ronment as efficient tool for computation in complex arrays and symbolic variables, namely for linear algebra, mathematic an	alysis, statistics, a	Igorithmization
and geometric represen		-	0
18PPY1	Programming in Python 1 tudents to advanced features of the Python language and common scientific packages. The course covers both object-oriented	Z	2
	part of the course describes the use of Python in the fields of scientific and technical computing (NumPy and SciPy packages),		
18PPY2	Programming in Python 2	Z	2
-	students to practical applications of the Python language in scientific as well as commercial fields. The course is a seminar w	I I	
	t demo of a real-world application in the specific field.	·	·
18PPY3	Programming in Python 3	Z	2
This advanced course is	intended for students who have basic experience with programming in Python and using its libraries. It introduces students to	advanced concer	ots of the Python
language and modules			
02SMF	Seminar of Mathematical Physics	Z	2
	inar is to iluminate mathematical physics by virtue of solved examples. It is supposed that the teachers of the physics depart	tment will present	simple tasks
-	ic activities that could become the topics of the student?s bachelor theses in the next year		2
11SPS	Seminar of computer simulations	Z	2
	D) is one of the most widespread atomistic simulation methods used, for example, in the prediction of experimental data, stud		
	of of druds. Within this course, hasic principles of MU) will be discussed with the active involvement of students during teach	na Durina semes	ter students will
	ent of drugs. Within this course, basic principles of MD will be discussed with the active involvement of students during teachi act illustrating practical applications of MD. Interim results or problems will be discussed and solved collectively. The output of	• •	
work on a selected proje		• •	
work on a selected proje	ect illustrating practical applications of MD. Interim results or problems will be discussed and solved collectively. The output of	• •	
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work on a selected proj form of presentation. In 11SFBM Knowledge of macromo and its structure:functio	ect illustrating practical applications of MD. Interim results or problems will be discussed and solved collectively. The output of this way, not only knowledge of MD, but also teamwork, independent research and presentation skills will be developed. Structure and Function of Biomolecules lecular structure is crucial for the understanding of its function. The subject is focused on the introduction to building blocks of n relationship including macromolecular complexes.	f each project will Z,ZK macromolecules,	be a scientific 3 overall structure
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work on a selected proje form of presentation. In 11SFBM Knowledge of macromo and its structure function TV-1 TV-2 TV-3 TV-4	ect illustrating practical applications of MD. Interim results or problems will be discussed and solved collectively. The output of this way, not only knowledge of MD, but also teamwork, independent research and presentation skills will be developed. Structure and Function of Biomolecules lecular structure is crucial for the understanding of its function. The subject is focused on the introduction to building blocks of n relationship including macromolecular complexes. Physical Education Physical Education Physical education Physical education	f each project will Z,ZK macromolecules, Z	be a scientific 3 overall structure 1 1 1 1 1
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12VKT	Vacuum Technology	KZ	4
Rarefied gasses: basi	c concepts and relations, diffusion,flow of rarefied gases. Flow and current of gas, conductivity. Interaction of gas with solid su	rface; sorption, de	sorption; gas
transport through soli	d matter; evaporation, condensation;Vacuum generation: Pumping proces, Ultimative pressure, Pumping speedPumps and the	ir properties:-Positi	ve displacemen
pumps: Diaphragm, S	liding vane rotary, Diffusion, Molecular, Roots, Molecular and Turbomolecular pumps. Sorption pumps: Cryopumps, Cryo-Ads	orption pumps, Sul	blimation and
NEG pumps, Ion gette	er pumps. Vacuum measurements: vacuum gauges of total and partial pressure; pumping speed; gas flow, search for leaks. N	laterials and vacuu	im components
and seals.Practical ex	recises.		
18ZALG	Basics of Algorithmization	Z,ZK	4
This course is devote	to selected algorithms and methods for algorithm design. This course intruduces selected methods for the determination of	the algorithm comp	olexity.
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. C	ircuit analysis meth	hods for linear
circuits include symbo	blic and complex method are explained. Proper circuit analysis is also lectured. The subject's final part deals with transient effective	ects inside linear ci	rcuits.
12ZFS	Fundamentals of Photonic Structures	Z,ZK	2
The lecture covers the	e basics of photonic structures, it classifies photonic structures compares them with the electronic structures, summarizes the	r preparation and	characterization
Specifically, the lectur	e discusses the basic physics and technology of optical waveguides; it introduces basic linear, nonlinear, and active structure	s of integrated pho	tonics for
applications in optical	communications and sensors. Next, the attention is given to introduction of plasmonic structures and plasmonics, periodic str	uctures and photo	nic crystals,
netamaterials, metas	urfaces, and finally to photonic structures for quantum technologies. Finally, the lecture is closed with student presentations o	n selected relevant	topics and
excursions to selected	d photonic laboratories.		
)2ZM1	Foundations of Physical Measurements 1	ZK	2
The lecture is designe	ed for students of physical specializations (Experimental particle physics, Physical engineering, Nuclear engineering), howeve	r, it can be attende	d by students
other branches. The c	pal of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired	data on a PC_Stud	lents learn the
	bai of the feetare is to initiodade the basics of physical measurements, the methods of processing and evaluation of acquired		ionto iouni trio
basic habits of work in		KZ	4
basic habits of work in 02ZM2	n a physics lab.	KZ	4
basic habits of work in 02ZM2 The lecture is designe	n a physics lab. Foundations of Physical Measurements 2	KZ r, it can be attende	4 d by students
basic habits of work in 02ZM2 The lecture is designe other branches. The g	h a physics lab. Foundations of Physical Measurements 2 ad for students of physical specializations (Experimental particle physics, Physical engineering, Nuclear engineering), however local of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired	KZ r, it can be attende	4 d by students
basic habits of work in 02ZM2 The lecture is designe	h a physics lab. Foundations of Physical Measurements 2 ad for students of physical specializations (Experimental particle physics, Physical engineering, Nuclear engineering), however local of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired	KZ r, it can be attende	4 d by students
Dasic habits of work in D2ZM2 The lecture is designed other branches. The g Dasic habits of work in 12ZFP	h a physics lab. Foundations of Physical Measurements 2 ed for students of physical specializations (Experimental particle physics, Physical engineering, Nuclear engineering), however poal of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired in a physics lab.	KZ r, it can be attende data on a PC. Stuc	4 d by students dents learn the 4
Dasic habits of work in D2ZM2 The lecture is designed other branches. The g Dasic habits of work in 12ZFP Basic physics of high	h a physics lab. Foundations of Physical Measurements 2 ed for students of physical specializations (Experimental particle physics, Physical engineering, Nuclear engineering), however local of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired in a physics lab. Principles of Plasma Physics	KZ r, it can be attende data on a PC. Stuc Z,ZK s, linear theory of w	4 d by students lents learn the 4 vaves in plasma
Dasic habits of work in D2ZM2 The lecture is designer other branches. The g basic habits of work in 12ZFP Basic physics of high and propagation of ele	h a physics lab. Foundations of Physical Measurements 2 ed for students of physical specializations (Experimental particle physics, Physical engineering, Nuclear engineering), however load of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired in a physics lab. Principles of Plasma Physics temperature plasmas is explained using particle, kinetic and fluid approaches. It includes drift motions and adiabatic invariants	KZ r, it can be attende data on a PC. Stuc Z,ZK s, linear theory of w rametric instabilitie	4 d by students lents learn the 4 vaves in plasm
Dasic habits of work in D2ZM2 The lecture is designed other branches. The g pasic habits of work in 12ZFP Basic physics of high and propagation of elect t comprises brief intro	h a physics lab. Foundations of Physical Measurements 2 ad for students of physical specializations (Experimental particle physics, Physical engineering, Nuclear engineering), howeve ioal of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired in a physics lab. Principles of Plasma Physics temperature plasmas is explained using particle, kinetic and fluid approaches. It includes drift motions and adiabatic invariants actromagnetic waves in inhomogeneous plasmas. Basic non-linear effects, such as ponderomotive force, self-focusing and pa	KZ r, it can be attende data on a PC. Stuc Z,ZK s, linear theory of w rametric instabilitie	4 d by students lents learn the 4 vaves in plasm
Dasic habits of work in D2ZM2 The lecture is designed other branches. The g pasic habits of work in 12ZFP Basic physics of high and propagation of eli- t comprises brief intro 12ZAOP	A a physics lab. Foundations of Physical Measurements 2 ad for students of physical specializations (Experimental particle physics, Physical engineering, Nuclear engineering), however ioal of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired in a physics lab. Principles of Plasma Physics temperature plasmas is explained using particle, kinetic and fluid approaches. It includes drift motions and adiabatic invariants ectromagnetic waves in inhomogeneous plasmas. Basic non-linear effects, such as ponderomotive force, self-focusing and pa aduction into magnetohydrodynamics and nuclear fusion. Basics of atomic physics od multiply-ionized plasmas are introduced	KZ r, it can be attende data on a PC. Stud Z,ZK s, linear theory of w rametric instabilitie I. Z,ZK	4 d by students lents learn the 4 vaves in plasm es are explaine 2
Dasic habits of work in D2ZM2 The lecture is designed other branches. The g pasic habits of work in 12ZFP Basic physics of high and propagation of eli- t comprises brief intro 12ZAOP The lecture covers the	A a physics lab. Foundations of Physical Measurements 2 ad for students of physical specializations (Experimental particle physics, Physical engineering, Nuclear engineering), however load of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired a physics lab. Principles of Plasma Physics temperature plasmas is explained using particle, kinetic and fluid approaches. It includes drift motions and adiabatic invariants ectromagnetic waves in inhomogeneous plasmas. Basic non-linear effects, such as ponderomotive force, self-focusing and pa douction into magnetohydrodynamics and nuclear fusion. Basics of atomic physics od multiply-ionized plasmas are introduced Fundamentals of Optics	KZ r, it can be attended data on a PC. Stud Z,ZK s, linear theory of warametric instabilities L Z,ZK Demotrical optics. Theorem	4 d by students lents learn the 4 vaves in plasm es are explaine 2 ne main goal o
Dasic habits of work in D2ZM2 The lecture is designed other branches. The g pasic habits of work in 12ZFP Basic physics of high and propagation of eli- t comprises brief intro 12ZAOP The lecture covers the he lecture is to obtain	A a physics lab. Foundations of Physical Measurements 2 ad for students of physical specializations (Experimental particle physics, Physical engineering, Nuclear engineering), however load of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired a physics lab. Principles of Plasma Physics temperature plasmas is explained using particle, kinetic and fluid approaches. It includes drift motions and adiabatic invariants ectromagnetic waves in inhomogeneous plasmas. Basic non-linear effects, such as ponderomotive force, self-focusing and pa doduction into magnetohydrodynamics and nuclear fusion. Basics of atomic physics od multiply-ionized plasmas are introduced Fundamentals of Optics every basics of optics - electromagnetic theory, linear optical physics and material effects, basics of nonlinear effects, and generative basics of optics - electromagnetic theory, linear optical physics and material effects, basics of nonlinear effects, and generative basics of optics - electromagnetic theory.	KZ r, it can be attende data on a PC. Stud Z,ZK s, linear theory of w rametric instabilitie L Z,ZK ometrical optics. The spect to character of	4 d by students lents learn the 4 vaves in plasm es are explaine 2 ne main goal o of the bachelo
Dasic habits of work in D2ZM2 The lecture is designed other branches. The g pasic habits of work in 12ZFP Basic physics of high and propagation of eli- t comprises brief intro 12ZAOP The lecture covers the he lecture is to obtain work. Particular topics	A a physics lab. Foundations of Physical Measurements 2 ad for students of physical specializations (Experimental particle physics, Physical engineering, Nuclear engineering), however load of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired a physics lab. Principles of Plasma Physics temperature plasmas is explained using particle, kinetic and fluid approaches. It includes drift motions and adiabatic invariants ectromagnetic waves in inhomogeneous plasmas. Basic non-linear effects, such as ponderomotive force, self-focusing and pa doduction into magnetohydrodynamics and nuclear fusion. Basics of atomic physics of multiply-ionized plasmas are introduced Fundamentals of Optics every basics of optics - electromagnetic theory, linear optical physics and material effects, basics of nonlinear effects, and gen n, on the bachelor level, broad and general information on optics, giving an essential orientation in the field, especially with res	KZ r, it can be attended data on a PC. Stud Z,ZK s, linear theory of warametric instabilities L Z,ZK cometrical optics. The spect to character of the sin vacuum (incluing)	4 d by students lents learn the 4 vaves in plasm es are explaine 2 ne main goal o of the bacheloo ding polarizati
Dasic habits of work in D2ZM2 The lecture is designed other branches. The g pasic habits of work in 12ZFP Basic physics of high and propagation of eli- t comprises brief intre 12ZAOP The lecture covers the he lecture is to obtain work. Particular topics effects), and further fr	A a physics lab. Foundations of Physical Measurements 2 ad for students of physical specializations (Experimental particle physics, Physical engineering, Nuclear engineering), however load of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired a physics lab. Principles of Plasma Physics temperature plasmas is explained using particle, kinetic and fluid approaches. It includes drift motions and adiabatic invariants ectromagnetic waves in inhomogeneous plasmas. Basic non-linear effects, such as ponderomotive force, self-focusing and pa doduction into magnetohydrodynamics and nuclear fusion. Basics of atomic physics of multiply-ionized plasmas are introduced Fundamentals of Optics every basics of optics - electromagnetic theory, linear optical physics and material effects, basics of nonlinear effects, and gen n, on the bachelor level, broad and general information on optics, giving an essential orientation in the field, especially with res are further elaborated during departmental masters program. The lecture stems from the electrodynamic notion of plane wave	KZ r, it can be attended data on a PC. Study Z,ZK s, linear theory of warametric instabilities L Z,ZK pmetrical optics. The spect to character of the sin vacuum (incluing) informs on conservation	4 d by students lents learn the 4 vaves in plasm es are explaine 2 ne main goal o of the bachelo ding polarizati quences in
basic habits of work in D2ZM2 The lecture is designed other branches. The groasic habits of work in 12ZFP Basic physics of high and propagation of eli- t comprises brief intre 12ZAOP The lecture covers the the lecture is to obtain work. Particular topics effects), and further fra anisotropic media, it effects	A a physics lab. Foundations of Physical Measurements 2 ad for students of physical specializations (Experimental particle physics, Physical engineering, Nuclear engineering), however load of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired a physics lab. Principles of Plasma Physics temperature plasmas is explained using particle, kinetic and fluid approaches. It includes drift motions and adiabatic invariants ectromagnetic waves in inhomogeneous plasmas. Basic non-linear effects, such as ponderomotive force, self-focusing and particulation into magnetohydrodynamics and nuclear fusion. Basics of atomic physics of multiply-ionized plasmas are introduced Fundamentals of Optics every basics of optics - electromagnetic theory, linear optical physics and material effects, basics of nonlinear effects, and gen, on the bachelor level, broad and general information on optics, giving an essential orientation in the field, especially with resis are further elaborated during departmental masters program. The lecture stems from the electrodynamic notion of plane wave om material medium. It explains basics of linear and nonlinear response in material medium and dispersion properties. It next	KZ r, it can be attended data on a PC. Stud Z,ZK s, linear theory of warametric instabilities Z,ZK grametrical optics. The spect to character of the sin vacuum (inclust informs on consequence processes, expression consequences)	4 d by students lents learn the 4 vaves in plasm es are explaine 2 ne main goal co of the bachelo ding polarizati quences in plains element
basic habits of work in 02ZM2 The lecture is designed other branches. The g basic habits of work in 12ZFP Basic physics of high and propagation of el- lt comprises brief intre 12ZAOP The lecture covers the the lecture is to obtain work. Particular topics effects), and further fr anisotropic media, it eo of two-wave interferen	A a physics lab. Foundations of Physical Measurements 2 ad for students of physical specializations (Experimental particle physics, Physical engineering, Nuclear engineering), however load of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired a physics lab. Principles of Plasma Physics temperature plasmas is explained using particle, kinetic and fluid approaches. It includes drift motions and adiabatic invariants ectromagnetic waves in inhomogeneous plasmas. Basic non-linear effects, such as ponderomotive force, self-focusing and pa doduction into magnetohydrodynamics and nuclear fusion. Basics of atomic physics od multiply-ionized plasmas are introduced Fundamentals of Optics every basics of optics - electromagnetic theory, linear optical physics and material effects, basics of nonlinear effects, and gen o, on the bachelor level, broad and general information on optics, giving an essential orientation in the field, especially with resis are further elaborated during departmental masters program. The lecture stems from the electrodynamic notion of plane wave om material medium. It explains basics of linear and nonlinear response in material medium and dispersion properties. It next explains processes induced by boundary conditions at interfaces. It also discusses the consequences of statistics on interference	KZ r, it can be attende data on a PC. Stud Z,ZK s, linear theory of w rametric instabilitie L Z,ZK ometrical optics. The spect to character as in vacuum (inclu- informs on consec- nce processes, exp phical form, includi	4 d by students lents learn the 4 vaves in plasm es are explaine 2 ne main goal o of the bacheloo ding polarizati quences in plains elements ng fundamenta

Code of the group: BSPJAZYKYZAP Name of the group: BS P jazyky zap Requirement credits in the group: Requirement courses in the group: Credits in the group: 0

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
04XAM1	English for Intermediate Students M1	Z	2	0+2	Z	V
04XAM2	English for Intermediate Students M2 V ra Šlechtová	Z	2	0+2	L	V
04XAM3	English for Intermediate Students M3 V ra Šlechtová	Z	2	0+2	Z	V
04XAP1	English for Advanced Students P1 V ra Šlechtová	Z	2	0+2	Z	V
04XAP2	English for Advanced Students P2 V ra Šlechtová	Z	2	0+2	L	V
04XAP3	English for Advanced Students P3 V ra Šlechtová	Z	2	0+2	Z	V
04XCESZ1	Czech for Foreigners - Beginners 1 Jana Ková ová Jana Ková ová (Gar.)	Z	2	0+2	Z	V
04XCESZ2	Czech for Foreigners - Beginners 2 Jana Ková ová Jana Ková ová (Gar.)	Z	2	0+2	L	V
04XCESZ3	Czech for Foreigners - Beginners 3 Jana Ková ová (Gar.)	Z	2	2S	Z	V
04XCESM1	Czech for Foreigners - Intermediate 1	Z	2	0+2	Z	V
04XCESM2	Czech for Foreigners - Intermediate 2 Jana Ková ová Jana Ková ová (Gar.)	Z	2	0+2	L	V

			1	1	r	1
04XCESM3	Czech for Foreigners - Intermediate 3 V ra Šlechtová Jana Ková ová (Gar.)	Z	2	0+2	Z	v
04XCESP1	Czech for Foreign Students - Advanced 1 Jana Ková ová Jana Ková ová (Gar.)	Z	2	0+2	z	v
04XCESP2	Czech for Foreigners - Advanced 2 Jana Ková ová Jana Ková ová (Gar.)	Z	2	0+2	L	V
04XCESP3	Czech for Foreigners - Advanced 3 V ra Šlechtová Jana Ková ová (Gar.)	Z	2	0+2	Z	V
04XFM1	French for Intermediate Students M1	Z	2	0+2	Z	V
04XFM2	French for Intermediate Students M2 V ra Šlechtová V ra Šlechtová (Gar.)	Z	2	0+2	L	v
04XFM3	French for Intermediate Students M3	Z	2	0+2	Z	v
04XFP1	French for Advanced Students P1 V ra Šlechtová V ra Šlechtová (Gar.)	Z	2	0+2	Z	v
04XFP2	French for Advanced Students P2 V ra Šlechtová V ra Šlechtová (Gar.)	Z	2	0+2	L	V
04XFP3	French for Advanded Students P3	Z	2	0+2	Z	V
04XFZ1	French for Beginners Z1 V ra Šlechtová V ra Šlechtová (Gar.)	Z	2	0+4	L	v
04XFZ2	French for Beginners Z2 V ra Šlechtová V ra Šlechtová (Gar.)	Z	2	0+4	Z	v
04XFZ3	French for Beginners Z3	Z	2	0+4	L	v
04XFZ4	V ra Šlechtová V ra Šlechtová (Gar.) French for Beginners Z4	Z	2	0+4	Z	v
04XFZ5	V ra Šlechtová French for Beginners Z5	Z	2	0+4	L	v
04XNM2	V ra Šlechtová German for Intermediate Students M2	Z	2	0+2	L	v
04XNM1	Miloslava echová Miloslava echová (Gar.) German for Intermediate Students M1		2	0+2	Z	v
04XNM3	V ra Šlechtová Miloslava echová (Gar.) German for Intermediate Students M3	Z	2	0+2	Z	v
04XNP1	V ra Šlechtová German for Advanced Students P1	Z	2	0+2	Z	v
04XNP2	V ra Šlechtová Miloslava echová (Gar.) German for Advanced Students P2	Z	2	0+2	L	v
04XNP3	Miloslava echová Miloslava echová (Gar.) German for Advanced Students P3	Z	_	0+2	Z	
	V ra Šlechtová Russian for Intermediate Students M1		2			V
04XRM1	V ra Šlechtová Zhanna Isaeva (Gar.) Russian for Intermediate Students M2	Z	2	0+2	Z	V
04XRM2	Zhanna Isaeva Zhanna Isaeva (Gar.) Russian for Intermediate Students M3	Z	2	0+2	L	V
04XRM3	V ra Šlechtová	Z	2	0+2	Z	V
04XRP1	Russian for Advanced Students P1 V ra Šlechtová Zhanna Isaeva (Gar.)	Z	2	0+2	Z	V
04XRP2	Russian for Advanced Students P2 Zhanna Isaeva Zhanna Isaeva (Gar.)	Z	2	0+2	L	V
04XRP3	Russian for Advanced Students P3 V ra Šlechtová	Z	2	0+2	Z	V
04XRZ1	Russian for Beginners Z1 Zhanna Isaeva Zhanna Isaeva (Gar.)	Z	2	0+4	L	V
04XRZ2	Russian for Beginners Z2 V ra Šlechtová Zhanna Isaeva (Gar.)	Z	2	0+4	Z	V
04XRZ3	Russian for Beginners Z3 Zhanna Isaeva Zhanna Isaeva (Gar.)	Z	2	0+4	L	V
04XRZ4	Russian for Beginners Z4 V ra Šlechtová	Z	2	0+4	Z	V
04XRZ5	Russian for Beginners Z5 V ra Šlechtová	Z	2	0+4	L	v
04XSM1	Spanish for Intermediate Students M1 Beatriz Vadillo Gonzalo (Gar.)	Z	2	0+2	Z	v
04XSM2	Spanish for Intermediate Students M3 Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)	Z	2	0+2	L	v
04XSM3	Spanish for Intermediate Students M3	Z	2	0+2	Z	V
04XSP1	Spanish for Advanced Students P1 V ra Šlechtová Beatriz Vadillo Gonzalo (Gar.)	Z	2	0+2	Z	v
04XSP2	Spanish for Advanced Students P2 Beatriz Vadillo Gonzalo (Gar.)	Z	2	0+2	L	v
04XSP3	Spanish for Advanced Students P3	Z	2	0+2	Z	v

04XSZ1	Spanish for Beginners Z1 Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)	Z	2	0+4	L	V	
04XSZ2	Spanish for Beginners Students Z2 V ra Šlechtová Beatriz Vadillo Gonzalo (Gar.)	Z	2	0+4	Z	V	
04XSZ3	Spanish for Beginners Z3 Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)	Z	2	0+4	L	V	
04XSZ4	Spanish for Beginners Z4 V ra Šlechtová	Z	2	0+4	Z	V	
04XSZ5	Spanish for Beginners Z5 V ra Šlechtová	Z	2	0+4	L	V	
Characteristics of the courses of this group of Study Plan: Code=BSPJAZYKYZAP Name=BS P jazyky zap							
	glish for Intermediate Students M1	•			Z	2	
•	udents who have successfully completed the full secondary school English language of				•		
	(CEFR). It provides an introduction into English for Specific and Academic Purposes (-			-		
extending the knowledge of g	communication situations. Thus it covers topics related to the student's life and needs	as well as topics	of subtechn	ical interest	. Attention is a	also paid to	
	glish for Intermediate Students M2				Z	2	
	student to have completed the AM1 course. It develops their skills for work with subte	chnical texts focu	ising also m	ore on sper	- 1		
	P and EAP (e.g., definition, existence and classification of phenomena, object description		0	•	•		
revision is included.	······································			3			
04XAM3 End	glish for Intermediate Students M3				Z	2	
	s that enable students to cope with features typical of professional style. Increasing atte	ntion is paid to dev	eloping sub	technical vo	cabulary and		
understanding of professiona	I texts. Great emphasis is placed on distinguishing different levels of formal and inform	nal oral and writte	n communic	ation and th	neir appropriat	e Czech	
· ·	includes studying abstracts and rules for writing them as well as basic rules for prepar	ring and giving a s	hort presen	tation on a	chosen topic r	elated to the	
student's field.							
	glish for Advanced Students P1				Z	2	
•	udents who have successfully completed the full secondary school English language	,					
	 CEFR). It provides an introduction into English for Specific and Academic Purposes in professional oral and written communication situations (fundamentals of terms in mate 				-		
	vritten communication on topics related to the undergraduate's life and needs. It develop				•	,	
	revision of selected grammar topics is included.				y = · · , · · · · · ·		
04XAP2 Eng	glish for Advanced Students P2				Z	2	
	AP1, thus extending the student's skills for working with subtechnical texts, and even	with professional	texts of cho	sen branche	es of science.	According to	
the students' needs it concer	ntrates on chosen grammar topics, but mainly intends to develop understanding of syn	tactic structures a	and typical r	hetorical fur	nctions (e.g., v	arious types	
	le, a case study). Increasing emphasis is placed on the undergraduate's independent			-		-	
	ent's subtechnical vocabulary, and includes fundamental notions of chosen branches of	of science. It is foo	used on fori	mal writing i	ncluding the s	entence and	
	cohesion and coherence in texts. glish for Advanced Students P3				Z	2	
	AP2 and expects the student to work without any guidance with authentic professional	materials and to ir	ternret the t	ext_lt_includ	- 1		
	ctions (e.g., expressing an opinion, agreement, and objections; taking part in discussion		•		•		
	given or chosen topic and presenting it. The course places emphasis on distinguishin			0	, .	•	
communication.							
04XCESZ1 Cze	ech for Foreigners - Beginners 1				Z	2	
-	udents on the English programme. Students will become acquainted with the main cha			-	-	-	
	speaking skills. The course focuses on pronounciation exercises, simple social phrase						
A1 (CEFR) approximately.	e course covers roughly lessons 1-5 in "Chcete mluvit esky" by H. Remediosová and l	E. echova. At the	end of the	course, the	students will r	lave reached	
	ech for Foreigners - Beginners 2				Z	2	
	ation competences acquired in CESZ1 are further developed. Students extend their kr	nowledge of Czec	h declensior	n and coniu	1		
	pics. The course covers roughly lessons 6-10 in "Chcete mluvit esky" by H. Remedio	•		, ,		•	
have reached A2 (CEFR) app	proximately.						
04XCESZ3 Cze	ech for Foreigners - Beginners 3				Z	2	
	the language and communication competences acquired in the XCESZ1 and XCESZ2		-			-	
	ning grammar, including grammar practice, and introducing Czech culture. Students a		•				
, <u> </u>	e understanding texts in terms of main ideas or looking for specific details in texts. The	e course covers re	bughly lesso	ns 5-7 in "	i		
	ech for Foreigners - Intermediate 1	rh formo oo well o	on ovtondi	a the stude	Z	2	
social situations.	ect pronunciation, important morphological phenomena, prepositional phrases, and ve	ID IOITIIS as well as	SULEXIENUI	ig the stude	III S VOCADUIA	ly loi vallous	
	ech for Foreigners - Intermediate 2				Z	2	
	cs covered in CESM1 and is then focused on more difficult grammar phenomena. It p	ractices writing, s	beaking, and	ا t reading sł	- 1	_	
	breviations, abbreviated words, and mathematical terms and formulas.			0			
04XCESM3 Cze	ech for Foreigners - Intermediate 3				Z	2	
The last course revises morp	hological topics covered earlier and extends the student's knowledge of more difficult	language phenor	nena. It is e	specially for	cused on stylis	stics and	
lexicology and on developing							
	ech for Foreign Students - Advanced 1			_	Z	2	
	e is very good knowledge of the Czech language, i.e., communicative competences at l			-			
	n of standard language structures, but mainly on practising more complex grammatica ngineering and professional communication, both in spoken and written form. The top		-			-	
-	teachers and faculty administrators.		Sity Studies			Placifice	
	ech for Foreigners - Advanced 2				Z	2	
	ent's knowledge acquired in CESP1 and focuses on difficult language phenomena. It	practises working	with technic	al and spe	- 1		
emphasis on individual work.		-					

04XCESP3 Czech for Foreigners - Advanced 3	Z	2
The course develops the student's knowledge from CESP2. It includes working with authentic specialist materials, their interpretation and presentation	on, and, finally, pre	sentation of the
student's project. Writing skills necessary for professional communication are trained.		
04XFM1 French for Intermediate Students M1	Z	2
French - intermediate FM The objective of this three-semester course is to improve and further develop communication in the French language in bo		
will be able to communicate in social interaction and in academic, scientific and professional environment. They will be able to use the language to tr	•	
information and to solve problems. FM1 The course builds on and further develops linguistic competence acquired at secondary school. It revises, sy		
skills gained in previous study. The following topics are covered: University studies in our country and in France, writing of transactional letters, CV, pe		
to an advert, French culture and geography, Paris. Topics of specialization: mathematics, physics. Reading technical and popular science texts, work	Z	2
04XFM2 French for Intermediate Students M2 Course FM2 builds on FM1. Linguistic structures and competence acquired in previous study are systemized and expanded. Reading popular science	- 1	_
and scientific language (passives, nominalization, word formation). Topics: physics, power engineering, environment, Internet, success of French sci		
scientists, artists and architects. Description of an object, device, shapes, dimensions, material.		gy, richen
04XFM3 French for Intermediate Students M3	Z	2
The course is focused on improvement and further development of linguistic competence acquired during the follow-up courses. Syntactic structures (- 1	
participle structures, compound tenses). Text summaryStudents prepare a written paper which will be delivered in form of an oral presentation in-c		
field of students' future specialisation or to their interest and generally covers a technical /applied science topic. It is not a translation but a creative w		
and one's own knowledge/experienceLonger monologues on topics /situations set for the examination are prepared. Text structure, cohesion and	coherence.	
04XFP1 French for Advanced Students P1	Z	2
FP advanced course The objective of this three-semester course is to improve and further develop communication in the French language in both w	ritten and oral form	n. Students will
be able to communicate in social interaction and in academic, scientific and work environment. They will be able to use the language to transmit gen	eral and technical	information and
to solve problems. FP1 The course builds on and further develops linguistic competence acquired at secondary school. Difficult grammar topics are re-	epeated and expar	nded: subjonctif,
passé composé-imparfait, pronouns. The following specific topics are covered: University studies in our country and in France, writing of transactiona	al letters, CV, perse	onal statement,
request, answer to an advert, environmental issues, success of French science and technology, chosen topics from French regional culture, Paris. Top	ics of specializatio	n: mathematics,
internet, physics, chemistry. Reading of technical and popular science texts, further work with these texts and interpretation.		
04XFP2 French for Advanced Students P2	Z	2
With the link to P1 contents, the course further develops language skills. Focus is put on reading popular science texts and on oral communication o	n given topics. Fea	atures typical of
technical and scientific communication are stressed (passive voice, nominalization, word formation).		
04XFP3 French for Advanded Students P3	Z	2
The course is focused on systemization and improvement of acquired linguistic competence, skills and knowledge, and their use for communication in		
skill - translation of shorter texts (both from and into the language). Writing of a paper and making oral presentation in-class. The paper generally cov	/ers a technical /a	pplied science
topic. It is a creative work compiled from 3 French sources. Preparation of several set topics for oral examination.		
04XFZ1 French for Beginners Z1	Z	2
French for beginners 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 :		
The course includes French for specific / technical communication and reading of popular science and scientific texts. FZ1 The objective is to be able		
level, actively using the knowledge of chosen elementary language. The contents is roughly outlined by lessons 1 - 7 of the textbook Pravda - Pravda		-
(Francouzština pro za áte ky). It is extended with situations of communication and functions from the textbook Espaces I, lessons 1-4 : introductions	-	-
giving the directions, simple instructions and questions. Special attention is paid to pronunciation. Spelling is explained in connection with pronuncial	-	
04XFZ2 French for Beginners Z2		2 de Drevdevé i
The course is linking up with FZ1. Elementary linguistic knowledge and communication skills are expanded. The scope is given by lessons 8 - 13 of French for Beginners . Additional topics and skills are filled in from the textbook Espaces I, lesson 1 - 5 (introductions, invitation, welcoming, agreem		
thanking, travelling, map of France, food, expression of will, wish, order, prohibition, pleasure). Correct pronunciation is practiced. Stress on oral comm	-	
How does the machine work? A few expressions concerning the study. Name of University and Faculty.	unication. Opecine	topics covered.
04XFZ3 French for Beginners Z3	Z	2
The course builts upon FZ2. Basic linguistic knowledge and skills are developed. The contents is given by lessons 14 - 18 of the textbook: Pravda - F	I I	
Topics, functions and situations are complemented from other materials. Stress is put on oral communication in dialogues and on reading, both for in		-
pronunciation practice. Reading covers short adapted texts of general interest first, and later popular science texts.		a do part or
04XFZ4 French for Beginners Z4	Z	2
The course builds up on FZ3. Basic linguistic knowledge and skills are further developed. Oral communication and reading skills are practiced. The course builds up on FZ3. Basic linguistic knowledge and skills are further developed.		
lessons 19 - 23 of the textbook French for Beginners, and is expanded with topics and functions from other materials. Reading is developed from the lea	• ,	
Students of FJFI. The course covers generals and specific topics: health- illness, sport, free time, environment, study, travelling in France, Paris, sho		° °
country and in France, how to write CV, application, topics in mathematics, reading physics - mechanics, informatics, internet.		
04XFZ5 French for Beginners Z5	Z	2
All four skills acquired in FZ4 are further developed, as well as technical language. Students prepare a paper on a chosen popular science topic. The	I I	
general contents is covered by lessons 24 - 26 of the textbook: Pravda-Pravdova, French for Beginners, and is complemented from other materials.	Topics: on physics	from lecture
notes, success of French science and technology, information about France. Grammar is systemized and complemented with syntax (subordinate cl	auses, typical con	junctions,
subjunctive clauses, gerund, passive.		
04XNM2 German for Intermediate Students M2	Z	2
The course introduces other more complex grammatical structures and their application in communication based on technical texts, such as the relation	n between technol	ogy and society,
the world at the beginning of the 21st century, linguistically more demanding texts on the environment, the language of mathematics, computers and	car technology et	c. Students
practise reading for information and reading aloud, and appropriate language for various purposes in oral and written communication. The course system	natically revises of	her grammatical
phenomena important for professional discourse (participles, relative clauses).		
04XNM1 German for Intermediate Students M1	Z	2
The objective of the course is to level off the students' skills in the German language. The course focuses on revision of more difficult phenomena an		
word formation processes (e.g. importance of verb prefixes). In the lexical part, it covers topics referring to higher education in both the Czech Repul	-	
environmental issues together with all necessary expressions and phrases, expressions and phrases needed to chemists, mathematicians, physicist	s, and the fundam	entals of IT
terminology. It develops communication on related topics and is aimed at correct pronunciation, grammatical correctness and understandability.		
04XNM3 German for Intermediate Students M3	Z	2
The course introduces other more complex grammatical structures and their application in communication based on technical texts, such as the relation		
the world at the beginning of the 21st century, linguistically more demanding texts on the environment, the language of mathematics, computers and		
practise reading for information and reading aloud, and appropriate language for various purposes in oral and written communication. The course syster phenomena important for professional discourse (participles, relative clauses).	natically revises of	ner grammatical
אין		

04XNP1 German for Advanced Students P1	Z 2
This course requires good grammar knowledge, extended general vocabulary, and good communication skills acquired at secondary so	chool to be levelled off at the beginning of the
course. The course is then focused on working with technical and scientific texts and practising reading techniques (skimming, scanning)	
more difficult grammar structures necessary for understanding a subtechnical text (passive voice, participles, participle structures) and it als	o focuses on practical everyday communication,
i.e., telephoning.	
04XNP2 German for Advanced Students P2	Z 2
The course develops the students' skills in working with professional scientific texts (understanding, summarising, note-taking, interpreting	
vocabulary range. It introduces mathematical expressions and texts of nuclear power engineering. Increasing emphasis is placed on unde	
both written and oral (CV, letter of application, interview, scholarship), and more complex grammatical structures (i.e., subjunctive, indir	
04XNP3 German for Advanced Students P3	Z 2
The course consists of 3 main parts (general communicative situations, grammar and technical topics). Students will develop their voca (traffic problems and car accidents, accident report, filling in a form, complaints). Based on presentations and technical and subtechnic	
nuclear power engineering, the environment, computer science, and car technology, will also be extended. Only authentic professional	
students are trained to process information gained from their reading of complex and difficult texts and present it to the class in a simplifie	
practice to and from German.	
04XRM1 Russian for Intermediate Students M1	Z 2
The course is designed for students with previous knowledge of Russian from secondary schools. Students are supposed to know the R	1 1
basic vocabulary for communication in everyday situations (introductions, socializing, greetings, shopping for food and objects of everyd	
they can use basic grammar structures (verbal and nominal forms, irregular verbs, pronouns). The initial knowledge corresponds to the	
contents and scope of the course correspond approximately to the RZ3 course, but for half of the time allotted in the timetable.	
04XRM2 Russian for Intermediate Students M2	Z 2
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	
04XRM3 Russian for Intermediate Students M3	Z 2
The course develops the knowledge and skills acquired in RM1 and RM2 and its contents and scope are roughly at the same level as the	
in the timetable.	
04XRP1 Russian for Advanced Students P1	Z 2
The entrance requirement for the course is to achieve the B1 CEFR level. The objective of the course is revision of standard languages	
structures, understanding the fundamentals of technical language and training writing skills.	······································
04XRP2 Russian for Advanced Students P2	Z 2
The course is based on RP1. It expands grammatical structures important for understanding technical texts (verbal adjectives, participle	
structures). Stress is put on independent oral and written communication.	
04XRP3 Russian for Advanced Students P3	Z 2
The course is based on RP2 and is mainly focused on working with technical and scientific texts (reading comprehension, oral and writ	
courses require good previous knowledge of general language at secondary level (listening, reading, correct communication in everyda	
these skills. Further study is aimed at professional and technical skills (reading technical literature according to the students' specializa	
develop their subtechnical vocabulary and practice quick and correct communication in professional situations. They will be able to both	
technical topics.	
04XRZ1 Russian for Beginners Z1	Z 2
The course represents the first stage of the five-semester programme, its final aim being reading and understanding professional texts w	vritten in Russian. Thus it begins with mastering
the Russian alphabet (for both reading and writing skills) and fundamentals of grammar necessary for everyday communication (listening	ng and speaking). Students will be able to read
a short text with marked stress, understand its contents and summarize it.	
04XRZ2 Russian for Beginners Z2	Z 2
The second semester of the programme is designed to teach skills for basic communication in everyday situations and for reading easy	/ and short subtechnical texts. Students will be
able to communicate using short sentences and appropriate structures, and read aloud with confidence a short text without marked stre	ess. They will also develop their vocabulary and
master further grammatical structures. They will have mastered with confidence the Russian alphabet and will be able to use it in writing	g
04XRZ3 Russian for Beginners Z3	Z 2
The course is based on RZ2 and includes further everyday topics, develops understanding of short compact texts on new subtechnical to	opics (for training various forms of reading skills
and listening) and introduces new grammar. Students will be trained to distinguish intonation patterns while listening to spoken language	e. They will be able to respond so as to be
understood, and to express their opinion. Writing skills will be trained on guided writing tasks and note-taking.	
04XRZ4 Russian for Beginners Z4	Z 2
The course is based on RZ3. It improves and expands the knowledge of general language in all four skills (reading and understanding lon	
words, oral communication in everyday situations, writing longer texts). Students are trained to use grammar structures effectively (e.g.,	
from Czech, modality, imperatives, conditionals). They practice and develop communication skills for everyday situations (food, travelling	
communication on more specific topics (environment, addictions, the green movement). They become acquainted with various geograp	hical data (e.g., Siberia), learn how to fill in
forms, look up the information from the timetable, learn about Russian holidays and typical meals.	
04XRZ5 Russian for Beginners Z5	Z 2
The course expects the student to have completed RZ4. It concentrates predominantly on reading skills (working with professional texts,	
information from a specialized text) and speaking, and to a certain extent, writing about the professional information obtained by reading	•
everyday topics. Studying grammar is based on professional and technical texts and only includes items typically used in professional of	
passive voice). Students develop their technical and economic vocabulary, and are also trained in some professional skills (writing a CV	
04XSM1 Spanish for Intermediate Students M1	
The course is designed for students whose competence is at level B1 of CEFR, i.e. those who studied Spanish in the secondary school	
vocabulary and pays attention to further grammar topics (e.g., perifrasis verbales, futuro imperfecto, direct object and indirect object pro	
subjunctive), to written and oral communication on a given everyday or easy subtechnical topic, for which the students are trained by re	
04XSM2 Spanish for Intermediate Students M3	f Spanish for apositio purposes in order to be
The course develops the students' knowledge from the previous course (SM1). Students are gradually acquainted with fundamentals o	opanism or specific purposes in order to be
able to work with specialized texts on the Internet.	
04XSM3 Spanish for Intermediate Students M3	
The course books are supplemented with additional subtechnical materials, so the students will be gradually acquainted with the peculia	
enough to use the Internet in Spanish and search for information of their specialization or field of interest. Students will use the information final part of the programme, general Spanish course based on course books, covers presentations and, finally, a written and oral exami	
I mai part of the programme, general spanish course pased on course pooks, covers presentations and, finally, a written and oral exam	mauvii.

04XSP1	Spanish for Advanced Students P1	Z	2		
Course concentrates or	nore difficult grammar topics, revision of vocabulary, basics of Spanish for specific purposes as well as written communicat	ion. Course prere	quisites: level B2		
of CEFR.					
04XSP2	Spanish for Advanced Students P2	Z	2		
Course SP2 is the seco	, nd part of the advanced Spanish course, extending Spanish for specific purposes topics. It comprises more grammar and sy	ntax and focuses	on independent		
written communication.					
04XSP3	Spanish for Advanced Students P3	Z	2		
Course SP3 is the final	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	o communication		
based on what students	s will need in their career.				
04XSZ1	Spanish for Beginners Z1	Z	2		
Course SZ1 is the first s	tage of the five-semester programme of Spanish studies; during the first stage the students will master phonetics and fundan	nental grammar st	ructures and will		
be able to communicate	e at an elementary level on topics of everyday life. They will acquire and extend fundamental vocabulary of general Spanish a	nd will develop it.			
04XSZ2	Spanish for Beginners Students Z2	Z	2		
Course SZ2 is based on	course SZ1, and expects students to develop and extend the knowledge and skills acquired so far. Grammar structures and l	exis will be choser	n so as to enable		
them to understand sho	rt adapted written texts and speech. Attention is also paid to cultural differences between Spanish-speaking countries and o	thers such as the	Czech Republic.		
Realia of Spanish-spea	king countries are also included.				
04XSZ3	Spanish for Beginners Z3	Z	2		
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,		
mainly of Spain. It pays	attention to further grammar topics (pretérito perfecto, pretérito indefinido, pretérito imperfecto, the gerund and the imperativ	e). It includes writ	ten and oral		
communication on a giv	en general topic, for which the student is trained by reading texts or listening to them.				
04XSZ4	Spanish for Beginners Z4	Z	2		
The course is based on	course SZ3. It develops the student's vocabulary and extends the knowledge of the culture and social customs of the Spani	sh speaking coun	tries, mainly of		
Spain. It pays attention	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 comr	nunication on a given general or subtechnical topic, for which the student is trained by reading texts or listening to them.				
04XSZ5	Spanish for Beginners Z5	Z	2		
The course books are s	upplemented with additional subtechnical materials, so the students will be gradually acquainted with peculiarities of Spanis	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.				

List of courses of this pass:

Code	Name of the course	Completion	Credits
00EKOT	Economy in Technology	Z	1
	The course introduces the basics of micro- and macroeconomics.	•	
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
	Review of basics of high school mathematics.	I	I
00PT	Preparatory Week	Z	2
00RET	Rhetoric	Z	1
The course is focu	ised on the acquisition of speech and voice techniques and on the rules of correct pronounciation. The course is also devoted to the	composition of put	blic speech
as well as to its	nonverbal 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
01ANB3	Calculus B 3	Z,ZK	8
1. Functional sec	uences and series - convergence range, criteria of uniform convergence, continuity, limit, differentiation and integration of functional	series, power serie	es, Series
	r's theorem. 2. Ordinary differential equations - equations of first order (method of integration factor, equation of Bernoulli, separation		0
	equation) and equations of higher order (fundamental system, reduction of order, variation of parameters, equations with constant coe		•
	tial equation). 3. Metric spaces - metric, norm, scalar product, neighborhood, interior and exterior points, boundary point, isolated and		-
	s of space, Hilbert spaces. Orthogonal polynomials. Complete orthogonal systems. 4. Fourier series - expansion of functions into Fouri		
series and their co	onvergence. 5. Differential calculus of functions of several variables - limit, continuity, partial and directional derivative, gradient, total of		gent plane,
	Taylor series, elementary terms of vector analysis, Jacobi matrix. 6. Functions defined implicitly by one or several equations		_
01ANB4	Calculus B 4	Z,ZK	6
	o et funkcí více prom nných a funkcionálních vektor . [2] Funkce zadané implicitn . [3] Taylorovy ady funkce více prom nných. [4] F	•	
	kartézské soustavy sou adnic. [5] Lokální, vázané a globální extrémy funkce více prom nných. [6] Základy teorie míry a obrys konstr	• •	
Integralni po et f	unkce více prom nných - Riemann v a Lebesgue v integrál, základní vlastnosti, Fubiniova v ta, v ta o substituci. Leviho a Lebesgu	eova v ta. Limita, :	spojitost a
	derivace integrálu podle parametru. [8] Integrály po k ivkách a plochách. Integrální v ty.	_	-
01LAL	Linear Algebra 1	Z	2
1. Vector space. 2	. Linear dependence and independence. 3. Basis and dimension. 4. Subspaces of vector spaces. 5. Linear mappings. 6. Matrices of I	inear mappings. 7.	Frobenius
	theorem.		
01LAL2	Linear Algebra 2	Z,ZK	4
	se matrix and operator. 2. Permutation and determinant. 3. Spectral theory (eigenvalue, eigenvector, diagonalization). 4. Hermitian an		
	jonality. 6. Metric geometry. 7. Riesz theorem and adjoint operator. Outline of the exercises: 1. Methods for calculation of inverse matr		
or determinants.	3. Calculation of eigenvalues and eigenvectors. 4. Hermitian and quadratic forms. Canonical form. 5. Scalar product and orthogonalit	iy. Calculation of or	thogonal
041 41 7	complements. 6. Geometry – exercises and examples. 7. Adjoint operators.	71/	2
01LALZ	Linear Algebra 1, exam	ZK	2

01MAN	Calculus 1	Z	4
01MAN2	Basic calculus (real analysis, functions of one real variable, differential calculus). Calculus 2	Z,ZK	8
	differential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergence, operations on series, absolute ar		-
Real and complex	power series, the Cauchy-Hadamard theorem, expansion of function into power series, summation of infinite series. 4. Theory of integration (Riemann definition), techniques of integration and application of integrals, Generalized Riemann integral	rals: primitives, defi	nite integral
01MANZ	Calculus 1, exam	ZK	4
01PRST	Probability and Statistics	Z,ZK	4
	of probability theory and mathematical statistics. The probability theory is build gradually beginning with the classical definition and		
	ons as random variable, distribution function of random variable and characteristics of random variable are treated and basic limit the e basis of this theory the basic methods of mathematical statistics such as estimation of distribution parameters and hypothesis testir		and proved.
01RMAF	Equations of Mathematical Physics	Z,ZK	7
	course is solving integral equations, theory of generalized functions, classification of partial differential equations, theory of integral tr		-
	partial differential equations (boundary value problem for eliptic PDE, mixed boundary problem for eliptic PDE).		
01UP1	Introduction to Probability 1	Z,ZK	3
	rith finite set of possible results, classical probability, independent random events 2. Probability and combinatorics 3. Probability and ge pability, Bayes' theorem, medical diagnosis, Simpson's paradox 5. Random variable with discrete state space, its distribution and mea		•
	the calculation of mean value 7.Probabilistic method in graph theory 8.Random algorithms, Morris algorithm and its variant		e internig
01UP2	Introduction to Probability 2	Z,ZK	3
	l continuous random variable and its statistical description. 2. Distribution function and probability density. 3. Axiomatic introduction of		
measure theory. 4.	Numerical characteristics of continuous random variables. 5. Selected variants of continuous distributions and their characteristics. 6.	Elementary metho	ods for point
02AMS	estimations. 7. Generating pseudorandom numbers from the selected distribution. Atomic and Molecular Spectroscopy	Z,ZK	4
027100	The lecture is devoted to atomic and molecular spectroscopy.		-
02DEF1	History of Physics 1	Z	2
	ace in the system of sciences. The relationship of man and nature. Natural sciences in ancient Orientand Greece, Greek natural philo	,	,
Helenistic period,	Archimed. Arabic science, European science in Middle Ages. Renaissance - da Vinci, Giordano Bruno. Copernicus, Kepler, Galileo, H	Huygens. The birth	of physics
02DEF2	as experimental science. Newton and his work. History of Physics 2	7	2
-	f classical mechanics after Newton, Bernoulli's, Euler, Lagrange. Historical development of optics, corpuscular and wave approach. E	I – I	
	vanism, electrodynamics and electromagnetism, Faraday and Maxwell. Thermodynamics and its laws, statistical physics, Boltzmann.		
and relativistic p	hysics, Planck and Einstein. Discovery of radioaktivity, structure of atom, atomic nucleus, Rutherford and Bohr. The way to nuclear er	nergy, Elementary	particles,
	standard model. The concept of Nature and Universe of today.		
02ELMA	Electricity and Magnetism pulomb's law, electrostatic field, Gauss' law. Electric dipole, polarization. Conductors anddielectrics. Electric current and circuits, cond	Z,ZK	6 ho rolotivity
-	Electrodynamic forces, magnetic field. Magnetic dipole, magnetics. Electromagnetic induction, ac currents. Electromagnetic waves, N	-	ne relativity
02EXF	Experimental Physics	ZK	2
The goal of this sub	ject is to introduce the students the principles of physics measurements, their techniques, methods and instruments that are used for	r such measureme	nts, and the
	analysis of measured data.		
02KM1	Quantum Mechanics 1 e describes the birth of quantum mechanics and description of one particle and more particles by elements of the Hilbert space as we	Z,ZK	6 on Besides
	that it includes description of observable quantities by operators in the Hilbert space and calculation of their spectra.		on. Desides
02KM2	Quantum Mechanics 2	Z,ZK	6
	ture expands the introduction to quantum mechanics with more general formalism of quantum theory, approximate methods and path	-	
terminology and me	ethods used in various applications of quantum mechanics and prepares the students for an effective scientific research and further stu formulations of quantum field theory.	idy, in particular, of	the modern
02MECH	Mechanics	Z	4
	ics, physical quantities and units. Particle kinematics, basic types of motion and theirsuperposition. Particle dynamics, one-dimension	1	
in central force fi	eld, forces innoninertial reference frames. Mechanics of system of free particles, two-body problem, collisions. Mechanics ofrigid bod	y, rotation. Fundam	nentals of
	continuum mechanics, elasticity, hydrodynamics. Sound.		
02MECHZ	Mechanics - Examination The content of the subject is the examination according to the plan of studies.	ZK	2
02PRA1	Experimental Laboratory 1	KZ	6
	d especially for students who intend to study some of the physical specializations of FNSPE(branch Physical Engineering, Nuclear Engineering, State and S		
-	ts interested in the otherspecializations. In Experimental laboratory students learn how to prepare for experiments (including work with the		
of the measuremer	t (acquire of different experimental procedures and routines), willteach writing the records of measurement, processing and evaluation practically extend the knowledge gained in lectures on physics.	on of results. At the	e same time
02PRA2	Experimental Laboratory 2	КZ	6
	d especially for students who intend to study some of the physical specializations of FNSPE(branch Physical Engineering, Nuclear Engineering)	1 1	
-	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 practically extend the knowledge gained in lectures on physics.	on of results. At the	e same time
02SMF	Seminar of Mathematical Physics	7	2
	he seminar is to iluminate mathematical physics by virtue of solved examples. It is supposed that the teachers of the physics departm	. – .	
	concerning their scientific activities that could become the topics of the student?s bachelor theses in the next year		
02TEF1	Theoretical Physics 1	Z,ZK	4
	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		-
	the first part of the course of classical theoretical physics (02TEF1, 02TEF2).		,

02TEF2	Theoretical Physics 2	Z,ZK	4
	sformations in physics. Mechanics of point mass, rigid body and continuum. The special theory of relativity: relativistic mechanics and		-
Minkowski space-ti	me. Classical electrodynamics: Maxwell's equations in the Minkowski space-time, electromagnetic waves in dielectric media, electron	nagnetic radiation i	n the dipole
	approximation.		<u> </u>
02TER	Heat and Molecular Physics	Z,ZK	. 4
	n of materials, heat transfer; stationary and non-stationary heat conduction, heat transfer and penetration; 1st and 2nd thermodynamic		-
02TJNS	ical systems: dielectric and magnetic materials; Maxwell relations and thermodynamic potentials; kinetic theory: Maxwell's velocity dist	KZ	2
	Transport Phenomena / Nonequilibrium Systems ces the students to the field of transport phenomena. The concept of a distribution function, Boltzmann equation, and H theorem are dis		_
	and approaches are applied specifically to problems of plasma physics.	scusseu. The gener	arconcepts
02TSFA	Thermodynamics and Statistical Physics	Z,ZK	4
	nodynamics and statistical physics. Thermodynamic potential, the Joule Thomson effect, conditions of equilibrium, the Braun-Le Chateli		-
	dy description from a statistical point of view (classical and quasiclassical regime within the frame of a canonical and grand-canonical		
	of crystals and the black body radiation). The Boltzmann equation is used to discusses simple transport phenomena.		
02VOAF	Waves, Optics and Atomic Physics	Z,ZK	6
	a in mechanics and electromagnetism: modes, standing and travelling waves, wave packets indispersive media. Wave optics: polariza		
coherence. Geo	metrical optics. Introduction toquantum physics: black body radiation, quantum of energy, photoeffect, the Compton effect, the de Bro	glie waves,the Sch	rodinger
007144	equation, stationary states and spectra of finite systems.	714	
02ZM1	Foundations of Physical Measurements 1	ZK	2 atudanta af
	gned for students of physical specializations (Experimental particle physics, Physical engineering, Nuclear engineering), however, it c ne goal of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired data		
other branches. In	basic habits of work in a physics lab.		
02ZM2	Foundations of Physical Measurements 2	KZ	4
	gned for students of physical specializations (Experimental particle physics, Physical engineering, Nuclear engineering), however, it c	1	-
	he goal of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired data	-	
	basic habits of work in a physics lab.		
04AKS	English Conversation	Z	1
	velop the student's communication skills acquired throughout their previous studies. It aims to improve all aspects of oral communication		
-	r various communication situations and will master their communication strategy. They will also practise their listening skills in order t		participate
	iscussions. The student will be trained to express their ideas clearly and according to current English usage, and become a more cor	ifident speaker.	
04XAM1	English for Intermediate Students M1	Z	2
	gned for students who have successfully completed the full secondary school English language course at least at the A2 level of the C inguages (CEFR). It provides an introduction into English for Specific and Academic Purposes (ESP, EAP), i.e., into fundamentals of		
	induces (CERK). It provides an introduction into English for Specific and Academic Purposes (ESF, EAF), i.e., into fundamentals of ind written communication situations. Thus it covers topics related to the student's life and needs as well as topics of subtechnical int		
protocolonial orar o	extending the knowledge of grammar issues used in EAP.		
04XAM2	English for Intermediate Students M2	Z	2
	expects the student to have completed the AM1 course. It develops their skills for work with subtechnical texts, focusing also more on		
and lexical items ty	pical of ESP and EAP (e.g., definition, existence and classification of phenomena, object descriptions). Part of the course is also guided	writing. If necessa	ry, grammar
	revision is included.		
04XAM3	English for Intermediate Students M3	Z	2
	bs 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		
equivalents. The co	purse 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.	n a chosen topic re	
04XAMZK	English for Intermediate Students Examination	ZK	4
	ent is the examination as given by the study plan. The examination covers the AM1, AM2, and AM3 courses and consists of two parts	I	-
	30 min). The student is expected to master the AM syllabus and demonstrate the ability to apply their knowledge gained in the three E		,
04XAP1	English for Advanced Students P1	Z	2
	gned for students who have successfully completed the full secondary school English language course (at least the B1 level of the C		
of Reference for	Languages - CEFR). It provides an introduction into English for Specific and Academic Purposes (ESP, EAP), i.e., into the fundamen	tals of vocabulary,	functions,
	e typical of professional oral and written communication situations (fundamentals of terms in mathematics and physics, definitions, g		-
covers professional	oral and written communication on topics related to the undergraduate's life and needs. It develops skills for free professional writing (w	riting a CV, letter of	application,
0.4)(4.50	polite request). If necessary, revision of selected grammar topics is included.	-	
04XAP2	English for Advanced Students P2	Z	2
	based on AP1, thus extending the student's skills for working with subtechnical texts, and even with professional texts of chosen brains it concentrates on chosen grammar topics, but mainly intends to develop understanding of syntactic structures and typical rhetorical texts.		-
	d, if possible, a case study). Increasing emphasis is placed on the undergraduate's independent work with and reading of linguistical		
-	s the student's subtechnical vocabulary, and includes fundamental notions of chosen branches of science. It is focused on formal writ	-	
	paragraph structure, linking, cohesion and coherence in texts.		
04XAP3	English for Advanced Students P3	Z	2
	based on AP2 and expects the student to work without any guidance with authentic professional materials and to interpret the text. It in	-	
	ills and functions (e.g., expressing an opinion, agreement, and objections; taking part in discussion, note-taking; summarizing, writing		-
also preparing a	project on a given or chosen topic and presenting it. The course places emphasis on distinguishing levels of formal and informal lang	uage both in oral a	nd written
	communication.	71/	1
04XAPZK	English for Advanced Students Examination t is the examination as given by the study plan. The student is supposed to demonstrate mastering the AP3 syllabus and the ability to a	ZK	4 de obtained
	courses. The examination as given by the study plan. The student is supposed to demonstrate mastering the AFS synabls and the ability to a courses. The examination consists of 2 parts - written (110 min) and oral (30 min) and includes also oral presentation of a topic from		-
04XCESM1	Czech for Foreigners - Intermediate 1	Z	2
	ed on correct pronunciation, important morphological phenomena, prepositional phrases, and verb forms as well as on extending the s		
	social situations.		

04XCESM2	Czech for Foreigners - Intermediate 2	Z	2
The course develo	ps the topics covered in CESM1 and is then focused on more difficult grammar phenomena. It practices writing, speaking, and reading	ng skills and trains	the student
	in understanding common abbreviations, abbreviated words, and mathematical terms and formulas.		
04XCESM3	Czech for Foreigners - Intermediate 3	Z	2
The last course r	evises morphological topics covered earlier and extends the student's knowledge of more difficult language phenomena. It is especial	ally focused on styl	istics and
	lexicology and on developing the student's writing skills.		
04XCESMZK	Czech for Intermediate Students Examination	ZK	4
The course conter	t is the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of the CES	M1,2,3 courses an	id can only
	be taken after successful completion of the 3 courses. Detailed information is to be obtained from the teacher.		
04XCESP1	Czech for Foreign Students - Advanced 1	Z	2
The prerequisite of	the course is very good knowledge of the Czech language, i.e., communicative competences at least at level B2 of the Common Europ	pean Framework of	Reference.
	on revision of standard language structures, but mainly on practising more complex grammatical structures typical of the style of sci		•
basics of functior	hal style of engineering and professional communication, both in spoken and written form. The topics include University Studies and S	Student Life. Writter	n practice
	includes communication with teachers and faculty administrators.		
04XCESP2	Czech for Foreigners - Advanced 2	Z	2
This course extend	s the student's knowledge acquired in CESP1 and focuses on difficult language phenomena. It practises working with technical and	specialist texts place	cing greater
	emphasis on individual work.		
04XCESP3	Czech for Foreigners - Advanced 3	Z	2
The course develop	os the student's knowledge from CESP2. It includes working with authentic specialist materials, their interpretation and presentation, a	and, finally, present	tation of the
	student's project. Writing skills necessary for professional communication are trained.		
04XCESPZK	Czech for Foreign Students - Advanced Examination	ZK	4
The course conte	nt is the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of the CES	SP1,2,3 courses an	d can only
	be taken after successful completion of the 3 courses. Detailed information is to be obtained from the teacher.		
04XCESZ1	Czech for Foreigners - Beginners 1	Z	2
	aned for students on the English programme. Students will become acquainted with the main characteristics of Czech (phonetic and g		-
	anguage and speaking skills. The course focuses on pronounciation exercises, simple social phrases, and oral and written communic		
communicative situ	ations. The course covers roughly lessons 1-5 in "Chcete mluvit esky" by H. Remediosová and E. echová. At the end of the course,	the students will ha	ave reached
04205070	A1 (CEFR) approximately.	7	
04XCESZ2	Czech for Foreigners - Beginners 2		2
	communication competences acquired in CESZ1 are further developed. Students extend their knowledge of Czech declension and co f frequent topics. The course covers roughly lessons 6-10 in "Chcete mluvit esky" by H. Remediosová and E. echová. At the end of		-
communication o	have reached A2 (CEFR) approximately.	the course, the st	
04XCESZ3	Czech for Foreigners - Beginners 3	7	2
	r develops the language and communication competences acquired in the XCESZ1 and XCESZ2 courses. The teaching focuses on	huilding up basic v	_
	ion, deepening grammar, including grammar practice, and introducing Czech culture. Students are asked to produce simple texts and		-
	ey also practise understanding texts in terms of main ideas or looking for specific details in texts. The course covers roughly lessons		
04XCESZZK	Czech for Foreigners – Beginners - Examination	ZK	4
	nt is the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of the 04X	I I	
	only be taken after successful completion of all three courses. Detailed information is to be obtained from the teacher.		
04XFM1	French for Intermediate Students M1	7	2
	ate FM The objective of this three-semester course is to improve and further develop communication in the French language in both v	written and oral forr	
	mmunicate in social interaction and in academic, scientific and professional environment. They will be able to use the language to tra		
information and to	solve problems. FM1 The course builds on and further develops linguistic competence acquired at secondary school. It revises, syste	mizes and expand	s language
skills gained in prev	rious study. The following topics are covered: University studies in our country and in France, writing of transactional letters, CV, persor	nal statement, requ	est, answer
to an advert,	French culture and geography, Paris. Topics of specialization: mathematics, physics. Reading technical and popular science texts, wo	ork based on these	texts.
04XFM2	French for Intermediate Students M2	Z	2
Course FM2 builds	on FM1. Linguistic structures and competence acquired in previous study are systemized and expanded. Reading popular science text	ts, features typical f	or technical
and scientific lar	guage (passives, nominalization, word formation). Topics: physics, power engineering, environment, Internet, success of French scie	nce and technolog	y, French
	scientists, artists and architects. Description of an object, device, shapes, dimensions, material.		
04XFM3	French for Intermediate Students M3	Z	2
	ed on improvement and further development of linguistic competence acquired during the follow-up courses. Syntactic structures (sub		
	es, compound tenses). Text summaryStudents prepare a written paper which will be delivered in form of an oral presentation in-clas		
	ture specialisation or to their interest and generally covers a technical /applied science topic. It is not a translation but a creative work	-	nch articles
	e's own knowledge/experienceLonger monologues on topics /situations set for the examination are prepared. Text structure, cohesi	,	
04XFMZK	French for Intermediate Students Examination	ZK	4
The content is the	e examination as given by the study programme. The whole French programme is ended with an examination covering the contents o		amination
	consists of a written and oral part and is organized according to Examination Instructions, a document available on the web	,	
04XFP1	French for Advanced Students P1	Z	2
	se The objective of this three-semester course is to improve and further develop communication in the French language in both writte		
	icate in social interaction and in academic, scientific and work environment. They will be able to use the language to transmit general		
	FP1 The course builds on and further develops linguistic competence acquired at secondary school. Difficult grammar topics are reper parfait, pronouns. The following specific topics are covered: University studies in our country and in France, writing of transactional le		
	an advert, environmental issues, success of French science and technology, chosen topics from French regional culture, Paris. Topics (
,	internet, physics, chemistry. Reading of technical and popular science texts, further work with these texts and interpretation	-	
04XFP2	French for Advanced Students P2	Z	2
	contents, the course further develops language skills. Focus is put on reading popular science texts and on oral communication on g	I – I	
	technical and scientific communication are stressed (passive voice, nominalization, word formation).		
04XFP3	French for Advanded Students P3	Z	2
	ed on systemization and improvement of acquired linguistic competence, skills and knowledge, and their use for communication in eng	I – I	
	f shorter texts (both from and into the language). Writing of a paper and making oral presentation in-class. The paper generally cover		-
	topic. It is a creative work compiled from 3 French sources. Preparation of several set topics for oral examination.		

04XFPZK	French for Advanced Students Examination	ZK	4
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 a	and is organized ac	ccording to
	Examination Instructions, a document available on the web. Assessment of the presentation is included into the examination gra		
04XFZ1	French for Beginners Z1	Z	2
-	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 soci		
	es French for specific / technical communication and reading of popular science and scientific texts. FZ1 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 - Pravd		-
	za áte ky). It is extended with situations of communication and functions from the textbook Espaces I, lessons 1-4 : introductions, pe lirections, simple instructions and questions. Special attention is paid to pronunciation. Spelling is explained in connection with pronu		-
04XFZ2	French for Beginners Z2		2
-	ng up with FZ1. Elementary linguistic knowledge and communication skills are expanded. The scope is given by lessons 8 - 13 of the	textbook: Pravda -	_
	ners. Additional topics and skills are filled in from the textbook Espaces I, lesson 1 - 5 (introductions, invitation, welcoming, agreeme		
Ŭ	map of France, food, expression of will, wish, order, prohibition, pleasure). Correct pronunciation is practiced. Stress on oral communic	0,	1 057
	How does the machine work? A few expressions concerning the study. Name of University and Faculty.		
04XFZ3	French for Beginners Z3	Z	2
The course builts	upon FZ2. Basic linguistic knowledge and skills are developed. The contents is given by lessons 14 - 18 of the textbook: Pravda - Pra	vdová: French for	Beginners.
Topics, functions	and situations are complemented from other materials. Stress is put on oral communication in dialogues and on reading, both for infe	ormation and loud	as part of
	pronunciation practice. Reading covers short adapted texts of general interest first, and later popular science texts.		
04XFZ4	French for Beginners Z4	Z	2
The course builds	up on FZ3. Basic linguistic knowledge and skills are further developed. Oral communication and reading skills are practiced. The con	itents is roughly co	overed with
	ne textbook French for Beginners, and is expanded with topics and functions from other materials. Reading is developed from the lecture		
Students of FJFI.	The course covers generals and specific topics: health- illness, sport, free time, environment, study, travelling in France, Paris, shoppi		ersity in our
	country and in France, how to write CV, application, topics in mathematics, reading physics - mechanics, informatics, internet		
04XFZ5	French for Beginners Z5	Z	2
	ed in FZ4 are further developed, as well as technical language. Students prepare a paper on a chosen popular science topic. They pr		
-	is covered by lessons 24 - 26 of the textbook: Pravda-Pravdova, French for Beginners, and is complemented from other materials. To		
notes, success	of French science and technology, information about France. Grammar is systemized and complemented with syntax (subordinate cla subjunctive clauses, gerund, passive	auses, typical conju	unctions,
	subjunctive clauses, gerund, passive.	71/	2
04XFZZK	French for Beginners Examination examination as given by the study plan. The course is terminated with an examination consisting of oral and written part. The examination	ZK	3 document
The content is the	Instruction for examination. Its content covers the levels FZ1 - FZ5.	alloff is fulled by life	
04XNM1	German for Intermediate Students M1	Z	2
-	e course is to level off the students' skills in the German language. The course focuses on revision of more difficult phenomena and st	I – I	_
-	processes (e.g. importance of verb prefixes). In the lexical part, it covers topics referring to higher education in both the Czech Repu		-
	sues 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		
04XNM2	German for Intermediate Students M2	Z	2
	ces other more complex grammatical structures and their application in communication based on technical texts, such as the relation be	I I	
the world at the b	beginning of the 21st century, linguistically more demanding texts on the environment, the language of mathematics, computers and c	car technology etc.	Students
practise reading for	information and reading aloud, and appropriate language for various purposes in oral and written communication. The course systematic	cally revises other ç	grammatical
	phenomena important for professional discourse (participles, relative clauses).		
04XNM3	German for Intermediate Students M3	Z	2
	ces other more complex grammatical structures and their application in communication based on technical texts, such as the relation be		-
	beginning of the 21st century, linguistically more demanding texts on the environment, the language of mathematics, computers and c		
practise reading for	information and reading aloud, and appropriate language for various purposes in oral and written communication. The course systemation		
	nhonomono important for professional dissource (participles, relative alouese)	cally revises other (grammatical
	phenomena important for professional discourse (participles, relative clauses).		
04XNMZK	German for Intermediate Students Examination	ZK	4
The course conten	German for Intermediate Students Examination is the examination as given by the study plan. The whole German for Intermediate Students Course is completed by an examination of	ZK consisting of two pa	4 arts - written
The course conten	German for Intermediate Students Examination is the examination as given by the study plan. The whole German for Intermediate Students Course is completed by an examination of ver the courses NM1 - NM3. The oral part follows after passing the written part successfully and after obtaining the 04NM3 assessme	ZK consisting of two pa	4 arts - written
The course conten and oral, which co	German for Intermediate Students Examination is the examination as given by the study plan. The whole German for Intermediate Students Course is completed by an examination of ver the courses NM1 - NM3. The oral part follows after passing the written part successfully and after obtaining the 04NM3 assessme is to be obtained from the teacher.	ZK consisting of two pa ent. More detailed i	4 arts - written information
The course content and oral, which co 04XNP1	German for Intermediate Students Examination is the examination as given by the study plan. The whole German for Intermediate Students Course is completed by an examination of ver the courses NM1 - NM3. The oral part follows after passing the written part successfully and after obtaining the 04NM3 assessme is to be obtained from the teacher. German for Advanced Students P1	ZK consisting of two pa ent. More detailed i Z	4 arts - written information 2
The course conten and oral, which co 04XNP1 This course requir	German for Intermediate Students Examination is the examination as given by the study plan. The whole German for Intermediate Students Course is completed by an examination of ver the courses NM1 - NM3. The oral part follows after passing the written part successfully and after obtaining the 04NM3 assessme is to be obtained from the teacher. German for Advanced Students P1 es good grammar knowledge, extended general vocabulary, and good communication skills acquired at secondary school to be level	ZK consisting of two pa ent. More detailed i Z led off at the begin	4 arts - written information 2 ning of the
The course conten and oral, which co 04XNP1 This course requir course. The course	German for Intermediate Students Examination is the examination as given by the study plan. The whole German for Intermediate Students Course is completed by an examination of ver the courses NM1 - NM3. The oral part follows after passing the written part successfully and after obtaining the 04NM3 assessme is to be obtained from the teacher. German for Advanced Students P1 es good grammar knowledge, extended general vocabulary, and good communication skills acquired at secondary school to be level is then focused on working with technical and scientific texts and practising reading techniques (skimming, scanning, reading for de	ZK consisting of two pa ent. More detailed i Z led off at the begin etail). It revises and	4 arts - written information 2 nning of the d develops
The course conten and oral, which co 04XNP1 This course requir course. The course	German for Intermediate Students Examination is the examination as given by the study plan. The whole German for Intermediate Students Course is completed by an examination of ver the courses NM1 - NM3. The oral part follows after passing the written part successfully and after obtaining the 04NM3 assessme is to be obtained from the teacher. German for Advanced Students P1 es good grammar knowledge, extended general vocabulary, and good communication skills acquired at secondary school to be level	ZK consisting of two pa ent. More detailed i Z led off at the begin etail). It revises and	4 arts - written information 2 nning of the d develops
The course conten and oral, which co 04XNP1 This course requir course. The course more difficult gram	German for Intermediate Students Examination is the examination as given by the study plan. The whole German for Intermediate Students Course is completed by an examination of ver the courses NM1 - NM3. The oral part follows after passing the written part successfully and after obtaining the 04NM3 assessme is to be obtained from the teacher. German for Advanced Students P1 es good grammar knowledge, extended general vocabulary, and good communication skills acquired at secondary school to be level the is then focused on working with technical and scientific texts and practising reading techniques (skimming, scanning, reading for de har structures necessary for understanding a subtechnical text (passive voice, participles, participle structures) and it also focuses on prac- i.e., telephoning.	ZK consisting of two pa ent. More detailed i Z led off at the begin etail). It revises and ctical everyday com	4 arts - written information 2 ning of the d develops imunication,
The course conten and oral, which co 04XNP1 This course requir course. The course more difficult gramm 04XNP2	German for Intermediate Students Examination is the examination as given by the study plan. The whole German for Intermediate Students Course is completed by an examination of ver the courses NM1 - NM3. The oral part follows after passing the written part successfully and after obtaining the 04NM3 assessme is to be obtained from the teacher. German for Advanced Students P1 es good grammar knowledge, extended general vocabulary, and good communication skills acquired at secondary school to be level is then focused on working with technical and scientific texts and practising reading techniques (skimming, scanning, reading for de nar structures necessary for understanding a subtechnical text (passive voice, participles, participle structures) and it also focuses on prac- i.e., telephoning. German for Advanced Students P2	ZK consisting of two pa ent. More detailed i Z led off at the begin etail). It revises and ctical everyday com Z	4 arts - written information 2 ning of the d develops imunication, 2
The course conten and oral, which co 04XNP1 This course requir course. The course more difficult gramm 04XNP2 The course develop	German for Intermediate Students Examination is the examination as given by the study plan. The whole German for Intermediate Students Course is completed by an examination of ver the courses NM1 - NM3. The oral part follows after passing the written part successfully and after obtaining the 04NM3 assessme is to be obtained from the teacher. German for Advanced Students P1 es good grammar knowledge, extended general vocabulary, and good communication skills acquired at secondary school to be level the is then focused on working with technical and scientific texts and practising reading techniques (skimming, scanning, reading for de har structures necessary for understanding a subtechnical text (passive voice, participles, participle structures) and it also focuses on prac- i.e., telephoning.	ZK consisting of two pa ent. More detailed i Z led off at the begin etail). It revises and ctical everyday com Z their general and s	4 arts - written information 2 uning of the d develops ununication, 2 subtechnical
The course conten and oral, which co 04XNP1 This course requir course. The course more difficult gramm 04XNP2 The course develop vocabulary range. I	German for Intermediate Students Examination is the examination as given by the study plan. The whole German for Intermediate Students Course is completed by an examination of ver the courses NM1 - NM3. The oral part follows after passing the written part successfully and after obtaining the 04NM3 assessme is to be obtained from the teacher. German for Advanced Students P1 es good grammar knowledge, extended general vocabulary, and good communication skills acquired at secondary school to be level is then focused on working with technical and scientific texts and practising reading techniques (skimming, scanning, reading for de nar structures necessary for understanding a subtechnical text (passive voice, participles, participle structures) and it also focuses on prac i.e., telephoning. German for Advanced Students P2 s the students' skills in working with professional scientific texts (understanding, summarising, note-taking, interpreting) while extending	ZK consisting of two parent. More detailed i Z led off at the begin etail). It revises and ctical everyday com Z their general and s actising formal com	4 arts - written information 2 uning of the d develops ununication, 2 subtechnical
The course conten and oral, which co 04XNP1 This course requir course. The course more difficult gramm 04XNP2 The course develop vocabulary range. I	German for Intermediate Students Examination is the examination as given by the study plan. The whole German for Intermediate Students Course is completed by an examination of ver the courses NM1 - NM3. The oral part follows after passing the written part successfully and after obtaining the 04NM3 assessme is to be obtained from the teacher. German for Advanced Students P1 es good grammar knowledge, extended general vocabulary, and good communication skills acquired at secondary school to be level te is then focused on working with technical and scientific texts and practising reading techniques (skimming, scanning, reading for de nar structures necessary for understanding a subtechnical text (passive voice, participles, participle structures) and it also focuses on practilities. German for Advanced Students P2 st the students' skills in working with professional scientific texts (understanding, summarising, note-taking, interpreting) while extending tintroduces mathematical expressions and texts of nuclear power engineering. Increasing emphasis is placed on understanding and pre-	ZK consisting of two parent. More detailed i Z led off at the begin etail). It revises and ctical everyday com Z their general and s actising formal com	4 arts - written information 2 uning of the d develops ununication, 2 subtechnical
The course conten and oral, which co 04XNP1 This course requir course. The course more difficult gramm 04XNP2 The course develop vocabulary range. I b 04XNP3	German for Intermediate Students Examination is the examination as given by the study plan. The whole German for Intermediate Students Course is completed by an examination of ver the courses NM1 - NM3. The oral part follows after passing the written part successfully and after obtaining the 04NM3 assessme is to be obtained from the teacher. German for Advanced Students P1 es good grammar knowledge, extended general vocabulary, and good communication skills acquired at secondary school to be level is then focused on working with technical and scientific texts and practising reading techniques (skimming, scanning, reading for de nar structures necessary for understanding a subtechnical text (passive voice, participles, participle structures) and it also focuses on practile., telephoning. German for Advanced Students P2 s the students' skills in working with professional scientific texts (understanding, summarising, note-taking, interpreting) while extending tintroduces mathematical expressions and texts of nuclear power engineering. Increasing emphasis is placed on understanding and practite written and oral (CV, letter of application, interview, scholarship), and more complex grammatical structures (i.e., subjunctive, indit	ZK consisting of two pa ent. More detailed i Z led off at the begin etail). It revises and ctical everyday com Z their general and s actising formal com rect speech). Z	4 arts - written information 2 uning of the d develops imunication, 2 subtechnical munication, 2
The course conten and oral, which co 04XNP1 This course requir course. The course more difficult gramm 04XNP2 The course develop vocabulary range. I b 04XNP3 The course consist (traffic problems at	German for Intermediate Students Examination is the examination as given by the study plan. The whole German for Intermediate Students Course is completed by an examination of ver the courses NM1 - NM3. The oral part follows after passing the written part successfully and after obtaining the 04NM3 assessment is to be obtained from the teacher. German for Advanced Students P1 es good grammar knowledge, extended general vocabulary, and good communication skills acquired at secondary school to be level the is then focused on working with technical and scientific texts and practising reading techniques (skimming, scanning, reading for define ar structures necessary for understanding a subtechnical text (passive voice, participles, participle structures) and it also focuses on practile., telephoning. German for Advanced Students P2 st he students' skills in working with professional scientific texts (understanding, summarising, note-taking, interpreting) while extending the written and oral (CV, letter of application, interview, scholarship), and more complex grammatical structures (i.e., subjunctive, individuely for Advanced Students P3 sts of 3 main parts (general communicative situations, grammar and technical topics). Students will develop their vocabulary in a varie and car accidents, accident report, filling in a form, complaints). Based on presentations and technical and subtechnical texts, the voca	ZK consisting of two parent. More detailed i consisting of two parent. More detailed i Iled off at the begin etail). It revises and ctical everyday com Z itheir general and sactising formal com rect speech). Z etay of less common abulary range in field	4 arts - written information 2 uning of the d develops imunication, 2 subtechnical munication, 2 subtechnical munication, 1 subtechnical subtechnical munication, 1 subtechnical subtechnical subtechnical subtechnical subtechnical subtechnical subtechnical subtechnical subtechnical subtechnical
The course conten and oral, which co 04XNP1 This course requir course. The course more difficult gramm 04XNP2 The course develop vocabulary range. I b 04XNP3 The course consist (traffic problems an nuclear power en	German for Intermediate Students Examination is the examination as given by the study plan. The whole German for Intermediate Students Course is completed by an examination of ver the courses NM1 - NM3. The oral part follows after passing the written part successfully and after obtaining the 04NM3 assessment is to be obtained from the teacher. German for Advanced Students P1 es good grammar knowledge, extended general vocabulary, and good communication skills acquired at secondary school to be level the is then focused on working with technical and scientific texts and practising reading techniques (skimming, scanning, reading for define ar structures necessary for understanding a subtechnical text (passive voice, participles, participle structures) and it also focuses on practile., telephoning. German for Advanced Students P2 st the students' skills in working with professional scientific texts (understanding, summarising, note-taking, interpreting) while extending at introduces mathematical expressions and texts of nuclear power engineering. Increasing emphasis is placed on understanding and practite written and oral (CV, letter of application, interview, scholarship), and more complex grammatical structures (i.e., subjunctive, indification, interview, scholarship), and more complex grammatical structures (i.e., subjunctive, indification, accident sport, filling in a form, complaints). Based on presentations and technical and subtechnical texts, the voca gineering, the environment, computer science, and car technology, will also be extended. Only authentic professional texts are used.	ZK consisting of two parent. More detailed i Led off at the begin led off at the begin etail). It revises and ctical everyday com Z their general and sactising formal com rect speech). Z ety of less common abulary range in fiel By means of a pre	4 arts - written information 2 uning of the d develops imunication, 2 subtechnical imunication, 2 n situations lds such as isentation,
The course conten and oral, which co 04XNP1 This course requir course. The course more difficult gramm 04XNP2 The course develop vocabulary range. I b 04XNP3 The course consist (traffic problems an nuclear power en	German for Intermediate Students Examination is the examination as given by the study plan. The whole German for Intermediate Students Course is completed by an examination of ver the courses NM1 - NM3. The oral part follows after passing the written part successfully and after obtaining the 04NM3 assessme is to be obtained from the teacher. German for Advanced Students P1 es good grammar knowledge, extended general vocabulary, and good communication skills acquired at secondary school to be level the is then focused on working with technical and scientific texts and practising reading techniques (skimming, scanning, reading for de nar structures necessary for understanding a subtechnical text (passive voice, participles, participle structures) and it also focuses on prac- i.e., telephoning. German for Advanced Students P2 s the students' skills in working with professional scientific texts (understanding, summarising, note-taking, interpreting) while extending tintroduces mathematical expressions and texts of nuclear power engineering. Increasing emphasis is placed on understanding and pra- toth written and oral (CV, letter of application, interview, scholarship), and more complex grammatical structures (i.e., subjunctive, indi German for Advanced Students P3 sto of 3 main parts (general communicative situations, grammar and technical topics). Students will develop their vocabulary in a varied and car accidents, accident report, filling in a form, complaints). Based on presentations and technical and subtechnical texts, the voca gineering, the environment, computer science, and car technology, will also be extended. Only authentic professional texts are used. d to process information gained from their reading of complex and difficult texts and present it to the class in a simplified oral form. The c	ZK consisting of two parent. More detailed i Led off at the begin led off at the begin etail). It revises and ctical everyday com Z their general and sactising formal com rect speech). Z ety of less common abulary range in fiel By means of a pre	4 arts - written information 2 uning of the d develops imunication, 2 subtechnical imunication, 2 n situations lds such as isentation,
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	sic grammar structures (verbal and nominal forms, irregular verbs, pronouns). The initial knowledge corresponds to the achievement		urse. The
	contents and scope of the course correspond approximately to the RZ3 course, but for half of the time allotted in the timetat		
04XRM2	Russian for Intermediate Students M2		2
	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 provident for later receding to RZ4, however, for half of the time allotted in the second s		
04XRM3	Russian for Intermediate Students M3	Z	2
The course develop	os the knowledge and skills acquired in RM1 and RM2 and its contents and scope are roughly at the same level as those of RZ5, howe in the timetable.	ever, for than of the	ume anotteu
04XRMZK	Russian for Intermediate Students Examination	ZK	4
	t is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowled	1	
	ents are eligible for the oral examination only after a prior pass in RM3 and a successful written examination. Students are given inst		
04XRP1	Russian for Advanced Students P1	7	2
	uirement for the course is to achieve the B1 CEFR level. The objective of the course is revision of standard language structures, practice of the course is revision of standard language structures, practice of the course is revision of standard language structures.	-	
	structures, understanding the fundamentals of technical language and training writing skills.	5	5
04XRP2	Russian for Advanced Students P2	Z	2
	ed on RP1. It expands grammatical structures important for understanding technical texts (verbal adjectives, participles, passives, ve	1	
	structures). Stress is put on independent oral and written communication.		,
04XRP3	Russian for Advanced Students P3	Z	2
	ed on RP2 and is mainly focused on working with technical and scientific texts (reading comprehension, oral and written paraphrasin	g, translation). The	
	od previous knowledge of general language at secondary level (listening, reading, correct communication in everyday situations). Th		
these skills. Furthe	er study is aimed at professional and technical skills (reading technical literature according to the students specialization, oral and w	ritten interpretation). Students
develop their subte	chnical vocabulary and practice quick and correct communication in professional situations. They will be able to both speak write acc	urately and with co	onfidence on
	technical topics.		
04XRPZK	Russian for Advanced Students Examination	ZK	4
The course conten	it is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowled	dge and skills acqu	ired in RP1
- RP3. Stud	ents are eligible for the oral examination only after a prior pass in RP3 and a successful written examination. Students are given inst	ructions by the tead	cher.
04XRZ1	Russian for Beginners Z1	Z	2
The course represe	ents the first stage of the five-semester programme, its final aim being reading and understanding professional texts written in Russiar	n. Thus it begins wit	h mastering
the Russian alphat	pet (for both reading and writing skills) and fundamentals of grammar necessary for everyday communication (listening and speaking). Students will be	able to read
	a short text with marked stress, understand its contents and summarize it.		
04XRZ2	Russian for Beginners Z2	Z	2
The second semes	ster of the programme is designed to teach skills for basic communication in everyday situations and for reading easy and short subt	echnical texts. Stud	lents will be
able to communication	te using short sentences and appropriate structures, and read aloud with confidence a short text without marked stress. They will als	o develop their voc	abulary and
	master further grammatical structures. They will have mastered with confidence the Russian alphabet and will be able to use it in	writing.	
04XRZ3	Russian for Beginners Z3	Z	2
The course is base	d on RZ2 and includes further everyday topics, develops understanding of short compact texts on new subtechnical topics (for training	y various forms of re	eading skills
and listoning) on	d interduces new measures. Ot dente will be taking die distinguish interdation actions while listening to produce terms and Therewill be		
and listering) an	d introduces new grammar. Students will be trained to distinguish intonation patterns while listening to spoken language. They will be	able to respond se	o as to be
and insterning) an	understood, and to express their opinion. Writing skills will be trained on guided writing tasks and note-taking.	e able to respond so	o as to be
04XRZ4		e able to respond so	o as to be
04XRZ4	understood, and to express their opinion. Writing skills will be trained on guided writing tasks and note-taking.	Z	2
04XRZ4 The course is base	understood, and to express their opinion. Writing skills will be trained on guided writing tasks and note-taking. Russian for Beginners Z4	Z Z	2 of unfamiliar
04XRZ4 The course is base words, oral comm from Czech, mod	understood, and to express their opinion. Writing skills will be trained on guided writing tasks and note-taking. Russian for Beginners Z4 d on RZ3. It improves and expands the knowledge of general language in all four skills (reading and understanding longer texts with a c function in everyday situations, writing longer texts). Students are trained to use grammar structures effectively (e.g., irregular verbe dality, imperatives, conditionals). They practice and develop communication skills for everyday situations (food, travelling, free time), a	Z certain percentage s, differences in ver and practice oral ar	2 of unfamiliar rb patterns nd written
04XRZ4 The course is base words, oral comm from Czech, mod	understood, and to express their opinion. Writing skills will be trained on guided writing tasks and note-taking. Russian for Beginners Z4 d on RZ3. It improves and expands the knowledge of general language in all four skills (reading and understanding longer texts with a c funcication in everyday situations, writing longer texts). Students are trained to use grammar structures effectively (e.g., irregular verbs dality, imperatives, conditionals). They practice and develop communication skills for everyday situations (food, travelling, free time), a n more specific topics (environment, addictions, the green movement). They become acquainted with various geographical data (e.g.	Z certain percentage s, differences in ver and practice oral ar	2 of unfamiliar rb patterns nd written
04XRZ4 The course is base words, oral comm from Czech, mor communication o	understood, and to express their opinion. Writing skills will be trained on guided writing tasks and note-taking. Russian for Beginners Z4 d on RZ3. It improves and expands the knowledge of general language in all four skills (reading and understanding longer texts with a c nunication in everyday situations, writing longer texts). Students are trained to use grammar structures effectively (e.g., irregular verbs dality, imperatives, conditionals). They practice and develop communication skills for everyday situations (food, travelling, free time), a n more specific topics (environment, addictions, the green movement). They become acquainted with various geographical data (e.g. forms, look up the information from the timetable, learn about Russian holidays and typical meals.	Z certain percentage s, differences in ver and practice oral ar I., Siberia), learn ho	2 of unfamiliar rb patterns nd written pw to fill in
04XRZ4 The course is base words, oral comm from Czech, mor communication o 04XRZ5	understood, and to express their opinion. Writing skills will be trained on guided writing tasks and note-taking. Russian for Beginners Z4 d on RZ3. It improves and expands the knowledge of general language in all four skills (reading and understanding longer texts with a c nunication in everyday situations, writing longer texts). Students are trained to use grammar structures effectively (e.g., irregular verbs dality, imperatives, conditionals). They practice and develop communication skills for everyday situations (food, travelling, free time), a n more specific topics (environment, addictions, the green movement). They become acquainted with various geographical data (e.g. forms, look up the information from the timetable, learn about Russian holidays and typical meals. Russian for Beginners Z5	Z certain percentage s, differences in ver and practice oral ar L, Siberia), learn ho Z	2 of unfamiliar rb patterns nd written ow to fill in 2
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04XRZ4 The course is base words, oral comm from Czech, mod communication o 04XRZ5 The course expects information from a	understood, and to express their opinion. Writing skills will be trained on guided writing tasks and note-taking. Russian for Beginners Z4 d on RZ3. It improves and expands the knowledge of general language in all four skills (reading and understanding longer texts with a consurtation in everyday situations, writing longer texts). Students are trained to use grammar structures effectively (e.g., irregular verse dality, imperatives, conditionals). They practice and develop communication skills for everyday situations (food, travelling, free time), a n more specific topics (environment, addictions, the green movement). They become acquainted with various geographical data (e.g. forms, look up the information from the timetable, learn about Russian holidays and typical meals. Russian for Beginners Z5 s the student to have completed RZ4. It concentrates predominantly on reading skills (working with professional texts, i.e. understandir specialized text) and speaking, and to a certain extent, writing about the professional information obtained by reading the texts. Communication specialized text) and speaking, and to a certain extent, writing about the professional information obtained by reading the texts. Communication states are the specialized text and speaking.	Z certain percentage s, differences in ver and practice oral ar I., Siberia), learn ho Z ng, extracting and s munication skills ar	2 of unfamiliar rb patterns nd written pow to fill in 2 summarizing e trained on
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04XSP3	Spanish for Advanced Students P3	Z	2
	e final part of the advanced Spanish course. It is based on texts chosen by the students according to their future specialization. It is focu	I I	
	based on what students will need in their career.		
04XSPZK	Spanish for Advanced Students Examination	ZK	4
	nt is the examination as given by the study plan. Examination SPZK consists of two parts, namely oral and written. The prerequisite for a	I I	art is 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	e student.	-
04XSZ1	Spanish for Beginners Z1	Z	2
	first stage of the five-semester programme of Spanish studies; during the first stage the students will master phonetics and fundament	al grammar structu	ires and will
be able to	o communicate at an elementary level on topics of everyday life. They will acquire and extend fundamental vocabulary of general Span	ish and will develop	pit.
04XSZ2	Spanish for Beginners Students Z2	Z	2
Course SZ2 is bas	sed on course SZ1, and expects students to develop and extend the knowledge and skills acquired so far. Grammar structures and lexis	will be chosen so a	as to enable
them to understar	nd short adapted written texts and speech. Attention is also paid to cultural differences between Spanish-speaking countries and other	s such as the Czec	h Republic.
	Realia of Spanish-speaking countries are also included.		
04XSZ3	Spanish for Beginners Z3	Z	2
The course is bas	sed on course SZ2, and develops the student's vocabulary and grammar structure. The course covers realia (history and culture) of the	Spanish-speaking	g countries,
mainly of Spain	. It pays attention to further grammar topics (pretérito perfecto, pretérito indefinido, pretérito imperfecto, the gerund and the imperative	. It includes written	n and oral
	communication on a given general topic, for which the student is trained by reading texts or listening to them.		
04XSZ4	Spanish for Beginners Z4	Z	2
	sed on course SZ3. It develops the student's vocabulary and extends the knowledge of the culture and social customs of the Spanish		
Spain. It pays att	ention to further grammar topics (perifrasis verbales, futuro imperfecto, direct object and indirect object pronouns, negative form of the	-	ubjunctive),
	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.	
04XSZ5	Spanish for Beginners Z5	Z	2
The course books	s are supplemented with additional subtechnical materials, so the students will be gradually acquainted with peculiarities of Spanish for		3. In its final
	part, the general Spanish course based on the course book will end with presentations and, finally, a written and oral examination		
04XSZZK	Spanish for Beginners Examination	ZK	3
The course con	tent is the examination as given by the study plan. Examination consists of two parts - written and oral. Student can register for oral ex	amination only if he	e/she has
	passed the written examination test.	r	
11ANEL	Linear Circuit Analysis	Z,ZK	4
The course is the	e introduction to the linear electronics for physicists. In the first part it describes basic methods of linear circuit analysis. It is especially		erstanding
	of the computer methods of analysis. The second part gives a short list of most commonly used circuits in experimental equipr		
11APLG	Applications of Group Theory in Solid State Physics	ZK	2
	atomic system symmetry allows, without any quantitative calculations, rigorously and precisely determine how many energy states th		
	etween them may occur. Therefore, the main purpose of this course is to describe the methods by which we can extract the informatio	-	
alone will provide.	The application of these methods is illustrated by an example of molecular orbitals, inner orbitals of ions in the crystal field environme	nt, normal modes o	of molecular
	vibrations, and selection rules for optical absorption transitions.		
11BPFI1	Bachelor Thesis 1	Z	5
	On the basis of the assignment and under the supervision of the supervisor, the student individually works on the assigned topic for 2		
11BPFI2	Bachelor Thesis 2	Z	10
	On the basis of the assignment and under the supervision of the supervisor, the student individually works on the assigned topic for 2		
11BSEM	Bachelor Seminar	Z	1
	the seminar, students familiarize themselves with the general principles of publishing and presenting scientific work and the formal requ		-
	culty. The second part is designed as a practical training for the defence of the bachelor's degree project. The students give oral preserved during the unark on their projects.		
the research re	sults achieved during the work on their projects. Each presentation is followed by a discussion on scientific matters as well as on the p student's performance.	ossibilities of impro	Jving the
11CFPL		71/	
	Introduction into the Chemistry and Physics of Polymer Materials of polymer materials, polymer characterization and processing. Properties of polymer matrix on macro-, micro-, nanometric, and molec		2
Dasic syntheses	relation synthesis - properties - processing, practical examples of solutions of chosen problems. The choice of polymers for physica		Solution of
11DAPL	Diffraction Analysis of Solid State The purpose of this course is to introduce the undergraduate students the experimental methods for studying real structure of s	ZK	2
4400			
11GNU	GNU Programming	KZ	4
	urse is to introduce students into the Linux system environment and therein used GNU utilities and programming tools to such a level, creating scripts and programs for processing acquired or simulated data for their experiments in physics with the use of the faculty's H	-	
	learned skills could of course be applied to any Linux system).		
11GPL	GNU Plot	Z	2
	urse is to introduce the Gnuplot program to students and teach them to use this flexible, universal and free tool to produce various grap		
	can then be applied within other courses where they need to produce graphs and images from data (practical classes, etc.) and also la	-	
11KFPL	Continuum in Solid State Physics	ZK	3
	bodices students to the basics of the application of the theoretical concept of continuum to the description of the properties of solids. The		
	selected examples of multiferroic	e model is demons	silated off
11MAPL	Solid State Physics – Applications and Analytic Methods	Z,ZK	4
	ribes the electrical and magnetic properties of metals and their alloys including superconductivity. Furthermore, electrical and optical		
	dielectrics and ferroelectrics and methods of their study are characterized.		5.10001013,
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 circ		
	microprocessors. The microcomputer architecture and principles of combination circuits, simple sequential circ	una complex cl	
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 ma	· · · ·	
	and its structure: function relationship including macromolecular complexes.		an an actual
11SFIPL	Seminar on Solid State Physics	KZ	2
	the Seminar and ?SSS? software features. 2.Module "bravais" - crystal structure and X-ray diffraction in 2D ? theory 3.Simulations of		
	nes: crystal lattice versus crystal structure, primitive cell, elementary cell, lattice plane, reciprocal grid, Laue and Bragg condition, atom	-	
1			

factor, extinction, practical structural analysis 4.Module "laue" - Diffraction on perfect and imperfect crystals 5.Simulations: influence of structural disorder on diffraction pattern, atomization and thermal oscillations, quasi crystals 6."born" module - dynamics of crystalline grid in 1D ? theory 7.Simulations: planar waves, traveling and standing waves, normal modes, polarization, energy and momentum transport, infinite chain, chain of finite lenght, boundary conditions, wave packets, group and phase velocity, dispersion, pulses and their propagation, localized modes, anharmonicity 8."debye" module - lattice dynamics and thermal capacity ? theory 9.Simulations: Brillouine zone, dispersion relation, density of states, thermal energy, heat capacity 10."drude" module - dynamics of classical electron gas in 2D ? theory 11.Simulations: diffuse electron movement, electron drift in an external electric field, Haynes and Shockley experiment, electron mobility, electron motion in magnetic field, cyclotron frequency, Hall experiment, magnetorezistence 12.Assignment, elaboration and presentation of the

	seminar work.		
11SPLA	Structure of Solid State	Z,ZK	4
Crystallograph	hy has an important role in the modern sciences because of its interdisciplinary nature. The aim of this lecture is to lay the basis of stu	udy of solid state p	hysics.
11SPS	Seminar of computer simulations	Z	2
Molecular dynamic	s (MD) is one of the most widespread atomistic simulation methods used, for example, in the prediction of experimental data, studies	of viruses, design	of complex
materials, or develo	opment of drugs. Within this course, basic principles of MD will be discussed with the active involvement of students during teaching.	During semester, s	students will
work on a selecte	d project illustrating practical applications of MD. Interim results or problems will be discussed and solved collectively. The output of e	ach project will be	a scientific
	form of presentation. In this way, not only knowledge of MD, but also teamwork, independent research and presentation skills will be	developed.	
11UFPLN	Introduction to Solid State Physics	ZK	2
	The purpose of this lecture is to introduce the undergraduate students to the study of the solid state physics.		-
11ZFPL	Basic to Solid State Physics	KZ	2
	amental properties of solids following the regular long distance ordering of atoms in a crystal lattice. Based on the introduced bonding		
•	s of crystals and their properties are defined. The model of crystalline lattice dynamics in harmonic approximation is described and basi	•	
	periodic potential of the crystal lattice is introduced and its relation to the following model describing the energetic state of electrons in		
	plained. The special consequences of band approach to the physical properties of solids are elucidated. The aim of the course is to s	-	
onorgy bando ox	interpret a broad phenomenological basis of physical properties of crystalline solids	systematically intro	
11ZSKL	Introduction to Condensed Matter Simulations	КZ	2
	on in condensed matter becomes an important tool in developing new materials and technologies used by both experimenters and the	1	
-	is thus transferred from real to 'virtual' computer lab. During the course, students will be introduced to basic computational methods and		-
practical problems i	non-quantum physics models, and will test their knowledge on practical examples.	procedures based	Un classical
401405		71/	0
12MOF	Molecular Physics	ZK	2
	deas on multi-atomic molecules and molecular matter, and on structure-to-physical properties relations. Methods of molecular structure		
12NME1	Numerical Methods 1	Z,ZK	4
	d the basic principles of numerical mathematics important for numerical solving of problems important for physics and technology. Me		
important for physi	icists (ordinary differential equations, random numbers) are included in addition to the basic numerical methods. Integrated computat	ional environment	MATLAB is
	used as a principle programming language as a demonstration tool. The seminars are held in computer laboratory.		
12NT	Nanotechnology	ZK	2
Lectures will introc	uce students mainly to modern technological methods of preparation of semiconductor, metal and dielectric nanostructures. Physica	l and chemical fun	daments of
different technolo	gies (MBE, MOVPE, EBL, sol-gel and colloidal solution) will be explained. Substantive attention will be devoted to epitaxial technology	gies which are sub	stantial for
nanostructure prep	paration. Particular emphasis will be focused on detail characterization of "in situ" and "ex situ" techniques, their applications for hete	rostructure and na	nostructure
growths will be disc	cussed as well. Some supportive technical methods - lithography, diffusion, evaporation, ion implantation, contact and dielectric layer	preparation will be	mentioned
	as well as soldering and encasement.		
12PAS	Computer Algebra Systems	Z	2
Practically oriented	dintroduction to computer algebra systems (CAS): their main characteristics, ways and means of using them. Constituent part is real	ized in computer c	lassrooms:
	students acquire basic skills with CAS by solving relatively simple and basic tasks from mathematics and physics.		
12UFN	Introduction to Photonics and Nanostructures	KZ	3
	r tructures and nanotechnologies; quantum technologies; quantum nanostructures; photonic structures; nanophotonics and nanoplasm	nonics; optical wave	eguides and
	fibers; integrated photonics; computer simulations; technological realization; student presentations		-
12UNXAP	Introduction to UNIX	Z	2
	perating systems. Personal computer, workstation and supercomputers. Processor, memory, bus, devices, hard disk, network interfa	-	
	ting systems. Operating system UNIX. Basic principles, kernel, kernel services. Documentation. File system, file atributes, working wi		
	eter (shell) bash and its programming (scripts). Controlling processes, process status, computer load a process priorities. Standard to		
	nputer networks. Local computer networks. Global computer networks. Addresses and protocols TCP/IP. Network configutation of a c	-	
	hardware sharing, mail, scp, etc. Network applications		
12UVP	Introduction to Scientific Computing	Z	2
	d Introduction to scientific computing. Constituent part of the course is realized in computer classroom. Students get acquinted with s	1	
Tradically offerrie	and technicval computing, data analysis, data visualisation and algorithm development.		1 Solontino
12VKT		1/7	4
	Vacuum Technology	KZ	4
-	basic concepts and relations; diffusion, flow of rarefied gases. Flow and current of gas, conductivity. Interaction of gas with solid surfa	-	
	olid matter; evaporation, condensation;Vacuum generation: Pumping proces, Ultimative pressure, Pumping speedPumps and their pro m, Sliding vane rotary, Diffusion, Molecular, Roots, Molecular and Turbomolecular pumps. Sorption pumps: Cryopumps, Cryo-Adsorp		
NEG pumps, ion g	etter pumpsVacuum measurements: vacuum gauges of total and partial pressure; pumping speed; gas flow, search for leaks. Mater		omponents
107400	and seals.Practical exercises.	7 71/	
12ZAOP	Fundamentals of Optics	Z,ZK	2
	the very basics of optics - electromagnetic theory, linear optical physics and material effects, basics of nonlinear effects, and geome	-	-
	tain, on the bachelor level, broad and general information on optics, giving an essential orientation in the field, especially with respec		
	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 in	-	
	it explains processes induced by boundary conditions at interfaces. It also discusses the consequences of statistics on interference		
of two-wave interference and their applications in interferometers. Based on the Fresnel diffraction integral, diffraction processes are presented in a graphical form, including fundamentals			
of grating diffraction. Based on this diffraction principle, basic functioning of holography is clarified. Finally, the lecture unravels the geometrical optics limit. It takes notice on geometrical			
approach imaging, substitutive schema of a paraxial imaging system, and optical aberrations. It shows fundamentals of imaging in optical instruments.			
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	-	
	e symbolic and complex method are explained. Proper circuit analysis is also lectured. The subject's final part deals with transient eff	octe incido linoar e	ircuits

12ZFP	Principles of Plasma Physics	Z,ZK	4
Basic physics of hig	h temperature plasmas is explained using particle, kinetic and fluid approaches. It includes drift motions and adiabatic invariants, line	ar theory of waves	in plasmas
and propagation of	electromagnetic waves in inhomogeneous plasmas. Basic non-linear effects, such as ponderomotive force, self-focusing and parame	etric instabilities are	e explained.
It comprises brief introduction into magnetohydrodynamics and nuclear fusion. Basics of atomic physics od multiply-ionized plasmas are introduced.			
12ZFS	Fundamentals of Photonic Structures	Z,ZK	2
The lecture covers	the basics of photonic structures, it classifies photonic structures compares them with the electronic structures, summarizes their pre	paration and chara	acterization.
Specifically, the	lecture discusses the basic physics and technology of optical waveguides; it introduces basic linear, nonlinear, and active structures	of integrated photo	onics for
	tical communications and sensors. Next, the attention is given to introduction of plasmonic structures and plasmonics, periodic struc	-	-
metamaterials, n	netasurfaces, and finally to photonic structures for quantum technologies. Finally, the lecture is closed with student presentations on s	selected relevant to	opics and
	excursions to selected photonic laboratories.		
14ELM	Electron Microscopy	KZ	2
	rse the students are introduced to the microscopic methods used for the characterization of materials, thin layers or nanoparticles. The		
, o, o	ht and electron microscopy and to various types of microscopes. An important part of the course is given to the interaction of different		
	lations 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 technique		
14TED	Creating Electronic Documents	Z	2
Basic skills for crea	ting and presenting student theses. Individual exercises focus on creating and formatting texts, equations, charts, tables, presentation	ns and entire docu	ments in an
	office suite.		
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 practical u	se are illustrated b	y examples
	solved in exercises.		
15CH2	General Chemistry 2	Z,ZK	3
-	ontinuation of the course General chemistry I. The main attention is paid to general principles governing chemical processes. Using	-	
the validity of these	principles is not restricted only to chemical processes is documented. The significance and practical use of explained principles are	illustrated by exam	ples solved
	in exercises.		
18PMTL	Programming in MATLAB	KZ	4
Introducing Matlab	environment as efficient tool for computation in complex arrays and symbolic variables, namely for linear algebra, mathematic analysis	sis, statistics, algor	rithmization
	and geometric representation of results.		
18PPY1	Programming in Python 1	Z	2
	ces students to advanced features of the Python language and common scientific packages. The course covers both object-oriented as		
paradigms. The following part of the course describes the use of Python in the fields of scientific and technical computing (NumPy and SciPy packages), data processing and visualization.			
18PPY2	Programming in Python 2	Z	2
This course intro	duces students to practical applications of the Python language in scientific as well as commercial fields. The course is a seminar whether the seminarial semi	ere each presente	ed topic is
	accompanied by a short demo of a real-world application in the specific field.		
18PPY3	Programming in Python 3	Z	2
This advanced cour	se is intended for students who have basic experience with programming in Python and using its libraries. It introduces students to adv	anced concepts of	f the Python
	language and modules they are based on.		
18ZALG	Basics of Algorithmization	Z,ZK	4
This course is	devoted to selected algorithms and methods for algorithm design. This course intruduces selected methods for the determination of	the algorithm com	plexity.
18ZPRO	Basics of Programming	Z	4
This course is in	ntended mainly for students with little or no experience in programming. It familiarizes the students with the basic concepts in program	nming and with the	Python
	programming language.		
TV-1	Physical Education	Z	1
TV-2	Physical Education	Z	1
TV-3	Physical education	Z	1
TV-4	Physical education	Z	1

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