Study plan

Name of study plan: Fyzikální inženýrství - Po íta ová fyzika

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: BSPFIPF1

Name of the group: BS P_FIB PF 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

Podmínkou skládání zkoušky 01MANZ je získání zápočtu z 01MAN.Podmínkou skládání 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
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 (Gar.)	Z	2	2P+2C		PS
01LALZ	Linear Algebra 1, exam Petr Ambrož, Lubomíra Dvo áková Lubomíra Dvo áková (Gar.)	ZK	2	0P+0C		PS
01LAL2	Linear Algebra 2 Petr Ambrož, 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 Be Michal Jex David Be (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
12UNXAP	Introduction to UNIX Milan Kucha ik Milan Kucha ik Milan Kucha ik Gar.)	Z	2	1P+1C	L	PS

8ZPRO	Basics of Programming Maksym Dreval, Vladimír Jarý, Miroslav Virius, Jakub Klinkovský, Petr Pauš, František Vold ich, Jan Tomsa, Zuzana Pet í ková Miroslav Virius Miroslav Virius (Gar.)	Z	4	4C	Z	PS
haracteristics	of the courses of this group of Study Plan: Code=BSPFIPF1 Name=B	S P_FIB PF	1st year			
2DEF1	History of Physics 1				Z	2
hysics and its place	in the system of sciences. The relationship of man and nature. Natural sciences in ancient Ori	entand Greece,	Greek natui	al philosoph	ers, Aristotl	e. Physics in
lelenistic period, Arc	chimed. Arabic science, European science in Middle Ages. Renaissance - da Vinci, Giordano B	runo. Copernici	ıs, Kepler, G	alileo, Huyg	ens. The birt	h of physics
s experimental scie	nce. Newton and his work.		•			
2ELMA	Electricity and Magnetism			Z	Z,ZK	6
	omb's law, electrostatic field, Gauss' law. Electric dipole, polarization. Conductors anddielectric	s. Electric curre	nt and circui	1	·	of the relativity
•	ic forces, magnetic field. Magnetic dipole, magnetics. Electromagnetic induction, ac currents. El				•	Í
)1LAL	Linear Algebra 1			i	Z	2
	near dependence and independence. 3. Basis and dimension. 4. Subspaces of vector spaces.	5 Linear manni	nas 6 Matri	es of linear	_	-
eorem.	tear dependence and independence. 5. Basis and difficultion. 4. Subspaces of vector spaces.	э. Ептсат ттаррп	igo. o. ividu i	ocs of fillical	mappings. /	. i iobcinas
1LALZ	Linear Algebra 1, exam				ZK	2
1LAL2					Z.ZK	4
	Linear Algebra 2	dia aonalization	\		, ,	•
	atrix and operator. 2. Permutation and determinant. 3. Spectral theory (eigenvalue, eigenvector,	-	-	-		
•	nality. 6. Metric geometry. 7. Riesz theorem and adjoint operator. Outline of the exercises: 1. Me					
	alculation of eigenvalues and eigenvectors. 4. Hermitian and quadratic forms. Canonical form.	s. Scalar produc	t and orthog	onality. Calc	culation of or	tnogonai
·	metry – exercises and examples. 7. Adjoint operators.			1		
1MAN	Calculus 1				Z	4
•	analysis, functions of one real variable, differential calculus).					
4 N 4 A N 1 7						
TMANZ	Calculus 1, exam				ZK	4
	Calculus 1, exam Calculus 2				ZK Z,ZK	4 8
1MAN2		e, operations or	n series, abs	Z	Z,ZK	8
1MAN2 Continuation of dif	Calculus 2	· •	*	olute and co	Z,ZK onditional co	8 nvergence 3
eal and complex po	Calculus 2 ferential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergence	· •	*	olute and co	Z,ZK onditional co	8 nvergence 3
1MAN2 . Continuation of dif eal and complex po Riemann definition),	Calculus 2 ferential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergence wer series, the Cauchy-Hadamard theorem, expansion of function into power series, summation	· •	*	olute and co	Z,ZK onditional co	8 nvergence 3
1MAN2 Continuation of difeal and complex policemann definition), 2MECH	Calculus 2 ferential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergence wer series, the Cauchy-Hadamard theorem, expansion of function into power series, summation techniques of integration and application of integrals, Generalized Riemann integral	n of infinite serie	es. 4. Theory	olute and co of integrals:	Z,ZK onditional co	8 nvergence 3 definite integr
1MAN2 Continuation of difeal and complex poor Riemann definition), 2MECH troduction to physic	Calculus 2 ferential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergence wer series, the Cauchy-Hadamard theorem, expansion of function into power series, summation techniques of integration and application of integrals, Generalized Riemann integral Mechanics	n of infinite serie	es. 4. Theory	colute and co of integrals: mensional e	Z,ZK onditional co primitives, c	8 nvergence 3 definite integral 4 motion, motion
1MAN2 . Continuation of difeal and complex positions are definition), 2MECH troduction to physical central force field,	Calculus 2 ferential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergence wer series, the Cauchy-Hadamard theorem, expansion of function into power series, summation techniques of integration and application of integrals, Generalized Riemann integral Mechanics s, physical quantities and units. Particle kinematics, basic types of motion and their superposition	n of infinite serie	es. 4. Theory	colute and co of integrals: mensional e	Z,ZK onditional co primitives, c	8 nvergence 3 definite integral 4 motion, motion
1MAN2 . Continuation of difeal and complex poor Riemann definition), 2MECH troduction to physical central force field, ontinuum mechanical.	Calculus 2 ferential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergence wer series, the Cauchy-Hadamard theorem, expansion of function into power series, summation techniques of integration and application of integrals, Generalized Riemann integral Mechanics s, physical quantities and units. Particle kinematics, basic types of motion and their superposition forces innoninertial reference frames. Mechanics of system of free particles, two-body problems, elasticity, hydrodynamics. Sound.	n of infinite serie	es. 4. Theory	olute and cc of integrals: mensional e d body, rota	Z,ZK onditional coprimitives, of quations of tion. Fundar	8 nvergence 3 definite integrated 4 motion, mo
1MAN2 Continuation of difeal and complex policemann definition), 2MECH troduction to physic central force field, ontinuum mechanic 2MECHZ	Calculus 2 ferential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergence were series, the Cauchy-Hadamard theorem, expansion of function into power series, summation techniques of integration and application of integrals, Generalized Riemann integral Mechanics s, physical quantities and units. Particle kinematics, basic types of motion and their superposition forces innoninertial reference frames. Mechanics of system of free particles, two-body problems, elasticity, hydrodynamics. Sound. Mechanics - Examination	n of infinite serie	es. 4. Theory	olute and cc of integrals: mensional e d body, rota	Z,ZK onditional co primitives, c	8 nvergence 3 definite integral 4 motion, motion
1MAN2 Continuation of difeal and complex por Riemann definition), 2MECH troduction to physic a central force field, portinuum mechanic 2MECHZ he content of the su	Calculus 2 ferential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergence were series, the Cauchy-Hadamard theorem, expansion of function into power series, summation techniques of integration and application of integrals, Generalized Riemann integral Mechanics s, physical quantities and units. Particle kinematics, basic types of motion and their superposition forces innoninertial reference frames. Mechanics of system of free particles, two-body problems, elasticity, hydrodynamics. Sound. Mechanics - Examination bject is the examination according to the plan of studies.	n of infinite serie	es. 4. Theory	olute and cc of integrals: mensional e d body, rota	Z,ZK onditional coprimitives, of quations of tion. Fundar	8 nvergence 3 definite integr 4 motion, motionentals of
1MAN2 . Continuation of difeal and complex por Riemann definition), 2MECH troduction to physic a central force field, portinuum mechanic 2MECHZ he content of the su OPT	Calculus 2 ferential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergence were series, the Cauchy-Hadamard theorem, expansion of function into power series, summation techniques of integration and application of integrals, Generalized Riemann integral Mechanics sphysical quantities and units. Particle kinematics, basic types of motion and their superposition forces innoninertial reference frames. Mechanics of system of free particles, two-body problems, elasticity, hydrodynamics. Sound. Mechanics - Examination bject is the examination according to the plan of studies. Preparatory Week	n of infinite serie	es. 4. Theory	Zolute and co of integrals: mensional e d body, rota	Z,ZK onditional coprimitives, of quations of tion. Fundar	8 nvergence 3 definite integrated 4 motion, motion, motion nentals of 2
1MAN2 Continuation of difeal and complex por Riemann definition), 2MECH troduction to physical central force field, ontinuum mechanical 2MECHZ the content of the suitable opt	Calculus 2 ferential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergence were series, the Cauchy-Hadamard theorem, expansion of function into power series, summation techniques of integration and application of integrals, Generalized Riemann integral Mechanics Mechanics	n of infinite serie	es. 4. Theory mics, one-di ihanics ofrigi	Zolute and co of integrals: mensional e d body, rota	Z,ZK onditional coprimitives, of quations of tion. Fundar	8 nvergence 3 definite integrated 4 motion, motion, motion, motion, motion, motion, motion, mentals of 2 4
1MAN2 Continuation of difeal and complex policiemann definition), 2MECH troduction to physic central force field, ontinuum mechanic 2MECHZ he content of the su 0PT 2TER hermal expansion of	Calculus 2 ferential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergence were series, the Cauchy-Hadamard theorem, expansion of function into power series, summation techniques of integration and application of integrals, Generalized Riemann integral Mechanics Mechanics	n. Particle dyna, collisions. Med	es. 4. Theory mics, one-di hanics ofrigi	Zolute and coof integrals: mensional ed body, rota	Z,ZK onditional coprimitives, of quations of tion. Fundar ZK Z,ZK inciple, idea	8 nvergence 3 definite integ 4 motion, motionentals of 2 4 I and real ga
1MAN2 Continuation of difeed and complex potential and complex potential and complex potential and complex potential force field, ontinuum mechanic 2MECHZ ne content of the support 2TER nermal expansion contropy; non-chemical	Calculus 2 ferential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergence were series, the Cauchy-Hadamard theorem, expansion of function into power series, summation techniques of integration and application of integrals, Generalized Riemann integral Mechanics Mechanics	n. Particle dyna, collisions. Med	es. 4. Theory mics, one-di hanics ofrigi	Zolute and coof integrals: mensional ed body, rota	Z,ZK onditional coprimitives, of the control of the	8 nvergence 3 definite integral 4 motion, motion nentals of 2 4 I and real ga tition theorei
1MAN2 Continuation of difeed and complex potential force field, ontinuum mechanic 2MECHZ ne content of the support 2TER nermal expansion contropy; non-chemica 2UNXAP	Calculus 2 ferential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergence were series, the Cauchy-Hadamard theorem, expansion of function into power series, summation techniques of integration and application of integrals, Generalized Riemann integral Mechanics	n. Particle dyna, collisions. Med	es. 4. Theory mics, one-di rhanics ofrigi d 2nd therm flaxwell's vel	zolute and coof integrals: mensional ed body, rota zodynamic procity distribut	Z,ZK onditional co primitives, c Z quations of tion. Fundar ZK Z Z,ZK inciple, idea ution, equipar	8 nvergence 3 definite integral 4 motion, motion nentals of 2 4 I and real gar etition theoret
1MAN2 Continuation of difeed and complex potential force field, ontinuum mechanic and content of the support and content of the support and expansion contropy; non-chemica and opera pomputer and opera	Calculus 2 ferential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergence were series, the Cauchy-Hadamard theorem, expansion of function into power series, summation techniques of integration and application of integrals, Generalized Riemann integral Mechanics	n. Particle dyna, collisions. Med	es. 4. Theory mics, one-di hanics ofrigi d 2nd thermolaxwell's vel	and the state of integrals: mensional e d body, rota Zodynamic procity distributer and control of the state	Z,ZK onditional coprimitives, or z quations of tion. Fundar ZK z,ZK inciple, idea attion, equipar Z dware and s	8 nvergence 3 definite integral 4 motion, motion nentals of 2 4 I and real ga tition theorer 2 software.
1MAN2 Continuation of difeal and complex por Riemann definition), 2MECH troduction to physical central force field, continuum mechanical 2MECHZ the content of the surplement	Calculus 2 ferential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergence were series, the Cauchy-Hadamard theorem, expansion of function into power series, summatio techniques of integration and application of integrals, Generalized Riemann integral Mechanics	n. Particle dyna, collisions. Med	es. 4. Theory mics, one-di hanics ofrigi d 2nd thermo laxwell's vel k, network in	and control of integrals: mensional ed body, rota Zodynamic procity distributer face. Har	Z,ZK pnditional coprimitives, of the control of the	8 nvergence 3 definite integral 4 motion, motion nentals of 2 4 I and real ga tittion theorer 2 software. ors: vi, emac
1MAN2 Continuation of difeal and complex pooler in the production to physic central force field, continuum mechanic 2MECHZ he content of the support of the support in the production to physic central force field, continuum mechanic 2MECHZ he content of the support in the production of the support in the production of	Calculus 2 ferential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergence were series, the Cauchy-Hadamard theorem, expansion of function into power series, summatio techniques of integration and application of integrals, Generalized Riemann integral Mechanics	n. Particle dyna, collisions. Medicateration; 1st and kinetic theory: Nevices, hard disfile system, file and a process p	es. 4. Theory mics, one-di hanics ofrigi d 2nd thermo laxwell's vel k, network in atributes, wo riorities. Star	mensional e d body, rota Zodynamic procity distributerface. Harorking with findard tools.	Z,ZK pnditional coprimitives, of the control of the	8 nvergence 3 definite integrated
1MAN2 Continuation of difeal and complex por Riemann definition), 2MECH troduction to physical central force field, ontinuum mechanical 2MECHZ he content of the sum option of the sum of the su	Calculus 2 ferential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergence were series, the Cauchy-Hadamard theorem, expansion of function into power series, summatio techniques of integration and application of integrals, Generalized Riemann integral Mechanics	n. Particle dyna, collisions. Medicateration; 1st and kinetic theory: Nevices, hard disfile system, file and a process p	es. 4. Theory mics, one-di hanics ofrigi d 2nd thermo laxwell's vel k, network in atributes, wo riorities. Star	mensional e d body, rota Zodynamic procity distributerface. Harorking with findard tools.	Z,ZK pnditional coprimitives, of the control of the	8 nvergence 3 definite integral 4 motion, motion nentals of 2 4 I and real ga rittion theorer 2 software. ors: vi, emacser interface
1MAN2 Continuation of difeal and complex por Riemann definition), 2MECH troduction to physical central force field, continuum mechanical 2MECHZ the content of the surface	Calculus 2 ferential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergence were series, the Cauchy-Hadamard theorem, expansion of function into power series, summatio techniques of integration and application of integrals, Generalized Riemann integral Mechanics	n. Particle dyna, collisions. Medicateration; 1st and kinetic theory: Nevices, hard disfile system, file and a process p	es. 4. Theory mics, one-di hanics ofrigi d 2nd thermo laxwell's vel k, network in atributes, wo riorities. Star	mensional e d body, rota Zodynamic procity distributerface. Harorking with findard tools.	Z,ZK pnditional coprimitives, of the control of the	8 nvergence 3 definite integral 4 motion, motion nentals of 2 4 I and real ga rittion theorer 2 software. ors: vi, emacser interface
1MAN2 Continuation of difeal and complex por Riemann definition), 2MECH troduction to physical central force field, continuum mechanical and content of the sum open open of the sum open open open open of the sum open open open open open open open open	Calculus 2 ferential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergence were series, the Cauchy-Hadamard theorem, expansion of function into power series, summatio techniques of integration and application of integrals, Generalized Riemann integral Mechanics	n. Particle dyna, collisions. Medicateration; 1st and kinetic theory: Nevices, hard disfile system, file and a process p	es. 4. Theory mics, one-di hanics ofrigi d 2nd thermo laxwell's vel k, network in atributes, wo riorities. Star	mensional e d body, rota Zodynamic procity distributerface. Harorking with findard tools.	Z,ZK pnditional coprimitives, of the control of the	8 nvergence 3 definite integrated
1MAN2 Continuation of diferent and complex position and definition), 2MECH roduction to physic central force field, ontinuum mechanica 2MECHZ ne content of the support of	Calculus 2 ferential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergence were series, the Cauchy-Hadamard theorem, expansion of function into power series, summatio techniques of integration and application of integrals, Generalized Riemann integral Mechanics	n. Particle dyna, collisions. Mediatration; 1st and kinetic theory: Nevices, hard disfile system, file and a process pP/IP. Network co	d 2nd thermodaxwell's vel k, network ir atributes, wo	mensional e d body, rota Zodynamic procity distributer face. Har orking with findard tools. (a) fa computer face and computer face.	Z,ZK onditional co primitives, of Z quations of tion. Fundar ZK Z Z,ZK inciple, idea tition, equipar Z dware and s les. Text edit Graphical us er. Network s	8 nvergence 3 definite integ 4 motion, motionentals of 2 4 I and real gartition theore 2 software. ors: vi, emacser interface services: 4

Code of the group: BSPFIPF2

Name of the group: BS P_FIB PF 2nd year

Requirement credits in the group:

Requirement courses in the group: In this group you have to complete at least 13 courses

Note on the group:

Credits in the group: 0

Předmět 02TEF1 lze absolvovat až po absolvování předmětu 02MECHZ. Předmět 02TEF2 lze absolvovat až po absolvování předmětů 02FLMA a 02TFF1

	ize absolvovat az po absolvovani predmet	u uzeliviA a	UZIEFI			
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
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 Pavel Váchal (Gar.)	Z,ZK	4	2+2	L	PS
12PAS	Computer Algebra Systems Milan Ši or Milan Ši or Milan Ši or (Gar.)	Z	2	1P+1C	Z	PS

18PRC1	Programming in C++ 1 Vladimír Jarý, Miroslav Virius Miroslav Virius (Gar.)	Z	4	2+2	Z	PS
18PRC2	Programming in C++ 2 Vladimír Jarý, Miroslav Virius, Jakub Klinkovský Miroslav Virius Miroslav Virius (Gar.)	KZ	4	2+2	L	PS
02TEF1	Theoretical Physics 1 Petr Novotný Petr Novotný Igor Jex (Gar.)	Z,ZK	4	2+2	Z	PS
02TEF2	Theoretical Physics 2 Filip Petrásek, Petr Novotný Josef Schmidt Petr Novotný (Gar.)	Z,ZK	4	2+2	L	PS
02TSFA	Thermodynamics and Statistical Physics Igor Jex, Jaroslav Novotný Antonín Hoskovec Igor Jex (Gar.)	Z,ZK	4	2+2	L	PS
12UVP	Introduction to Scientific Computing Milan Ši or Milan Ši or (Gar.)	Z	2	1P+1C	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
12VPMF	Selected Topics in Modern Physics Jan Pšikal Jan Pšikal (Gar.)	Z	3	2P+1C	L	PS
12ZMDT	Measurement and Data Processing Ivan Procházka, Josef Blažej Josef Blažej Ivan Procházka (Gar.)	Z,ZK	2	1P+1C	Z	PS

	Jan Pšikal Jan Pšikal Jan Pšikal (Gar.)		٥	25+10		PS
12ZMDT	Measurement and Data Processing Ivan Procházka, Josef Blažej Josef Blažej Ivan Procházka (Gar.)	Z,ZK	2	1P+1C	Z	PS
Characteristics of the	e courses of this group of Study Plan: Code=BSPFIPF2 Name	BS P_FIB PF	2nd yea	r		
	alculus B 3				',ZK	8
	d series - convergence range, criteria of uniform convergence, continuity, limit, differe	ntiation and integra	tion of func	1		_
•	n. 2. Ordinary differential equations - equations of first order (method of integration fac				-	
= = = = = = = = = = = = = = = = = = = =	and equations of higher order (fundamental system, reduction of order, variation of page 1)	=	-			_
	tion). 3. Metric spaces - metric, norm, scalar product, neighborhood, interior and exter				•	•
· ·	ce, Hilbert spaces. Orthogonal polynomials. Complete orthogonal systems. 4. Fourier se	-			=	
	e. 5. Differential calculus of functions of several variables - limit, continuity, partial and	•			_	
•	rms of vector analysis, Jacobi matrix. 6. Functions defined implicitly by one or several		, 0			
01ANB4 Ca	alculus B 4			7	Z,ZK	6
	ií více prom nných a funkcionálních vektor . [2] Funkce zadané implicitn . [3] Tayloro	vv. adv funkce více	e prom nný			_
	oustavy sou adnic. [5] Lokální, vázané a globální extrémy funkce více prom nných. [6]					
•	prom nných - Riemann v a Lebesgue v integrál, základní vlastnosti, Fubiniova v ta					
- ·	rametru. [8] Integrály po k ivkách a plochách. Integrální v ty.	,			, -	, -,
	umerical Methods 1			7	Z,ZK	4
ı	ic principles of numerical mathematics important for numerical solving of problems im	nortant for physics	and techno	1		•
•	inary differential equations, random numbers) are included in addition to the basic nu					
	iming language as a demonstration tool. The seminars are held in computer laborator		negrated of	mputational	renvironinent	IVIAILAD
		у.			7	
	omputer Algebra Systems	-fi	-414		Z	2
	tion to computer algebra systems (CAS): their main characteristics, ways and means	_	istituent pai	t is realized	in computer of	ciassroom
	s with CAS by solving relatively simple and basic tasks from mathematics and physics					
	ogramming in C++ 1				Z	4
•	he C programming language and non-object oriented features of the C++ language.					
18PRC2 Pr	ogramming in C++ 2				KZ	4
This course covers the obje	ct oriented programming and othesr advanced constructs in the C+;+ programming la	nguage and the St	andard Tem	plate Library	y.	
02TEF1 Th	neoretical Physics 1			Z	Z,ZK	4
	n to analytical mechanics. The students acquire knowledge of the basic concepts of the	e Lagrange and Ha	miltonian fo	rmalism as v	vell as diferen	t approach
to description of dynamics (Newton's, Lagrange, Hamilton and Hamilton-Jacobi equations). The efficiency of thes	e methods is illustr	ated on ele	mentary exa	mples like the	two-body
problem, the motion of a sys	stem of constrained mass points, and of a rigid body. Advanced parts of the course co	ver differential and	l integral pri	nciples of me	echanics. The	subject is
the first part of the course o	f classical theoretical physics (02TEF1, 02TEF2).					
02TEF2 Th	neoretical Physics 2			Z	',ZK	4
		of relativity: relativis	tic mechani			
	s in physics. Mechanics of point mass, rigid body and continuum. The special theory of				sicai field thec	ry in the
Tensors and transformation	s in physics. Mechanics of point mass, rigid body and continuum. The special theory on sical electrodynamics: Maxwell's equations in the Minkowski space-time, electromagn		ctric media,			-
Tensors and transformation Minkowski space-time. Clas			ctric media,			-
Tensors and transformation Minkowski space-time. Clas approximation.	sical electrodynamics: Maxwell's equations in the Minkowski space-time, electromagn		ctric media,	electromagr	netic radiation	in the dip
Tensors and transforma ^t ion Minkowski space-time. Clas approximation. D2TSFA Th	sical electrodynamics: Maxwell's equations in the Minkowski space-time, electromagn	etic waves in diele		electromagr	netic radiation	in the dip
Fensors and transformation Minkowski space-time. Clast Approximation. D2TSFA The Toundation of thermodynam	sical electrodynamics: Maxwell's equations in the Minkowski space-time, electromagn nermodynamics and Statistical Physics hics and statistical physics. Thermodynamic potential, the Joule Thomson effect, condition	etic waves in diele	the Braun-L	electromagr Z e Chatelier p	netic radiation 7,ZK principle. Statis	4 stical entro
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Code of the group: BSPFIPF3

Name of the group: BS P_FIB PF 3rd 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

12BPFI1

Note on the group:

Bachelor Project 1

software for parallel simulations. Databases of scientific information, scientist evaluation, citation analysis.

Zkoušku z předmětu 01RMAF lze skládat až po složení všech zkoušek z Matematické

Z

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) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
12BPFI1	Bachelor Project 1 Ivan Richter Ladislav Kalvoda (Gar.)	Z	5	0P+5C		PS
12BPFI2	Bachelor Project 2 Ivan Richter Ladislav Kalvoda (Gar.)	Z	10	0P+10C		PS
02KM1	Quantum Mechanics 1 Martin Štefa ák Martin Štefa ák (Gar.)	Z,ZK	6	4P+2C	Z	PS
12POAL	Computer Algebra Richard Liska Richard Liska (Gar.)	KZ	2	2	Z	PS
01RMAF	Equations of Mathematical Physics Václav Klika Václav Klika Václav Klika (Gar.)	Z,ZK	7	4P+2C		PS
11BSEM	Bachelor Seminar Radka Mika Havlíková, Ladislav Kalvoda Ladislav Kalvoda (Gar.)	Z	1	0P+2C	L	PS
01DYKO	Introduction to Continuum Dynamics Pavel Strachota, Radek Fu ik Pavel Strachota Radek Fu ik (Gar.)	Z,ZK	3	2P+1C		PS
12UPF1	Introduction to Computational Physics 1 Milan Kucha ík, Richard Liska Milan Kucha ík Milan Kucha ík (Gar.)	Z,ZK	2	1P+1C	Z	PS
12UPF2	Introduction to Computational Physics 2 Milan Kucha ík, Richard Liska Milan Kucha ík Milan Kucha ík (Gar.)	Z,ZK	2	1P+1C	L	PS
12PYTH	Scientific Programming in Python Pavel Váchal, Jakub Urban Pavel Váchal Pavel Váchal (Gar.)	Z	2	0+2	L	PS
12ZELD	Fundamentals of Electrodynamics Milan Ši or Ivan Richter Ivan Richter (Gar.)	Z,ZK	2	2+0	Z	PS
11ZFPL	Basic to Solid State Physics Ladislav Kalvoda, Eva Mihóková Eva Mihóková Ladislav Kalvoda (Gar.)	KZ	2	26P+0C	Z	PS
12ZFP	Principles of Plasma Physics Martin Jirka, Ji í Limpouch Martin Jirka Ji í Limpouch (Gar.)	Z,ZK	4	3+1	L	PS
12ZAOP	Fundamentals of Optics Ivan Richter, Pavel Kwiecien Ivan Richter Ivan Richter (Gar.)	Z,ZK	2	2+0	Z	PS

Characteristics of the courses of this group of Study Plan: Code=BSPFIPF3 Name=BS P_FIB PF 3rd year

12BPFI2	Bachelor Project 2	Z	10
The bachelor proje	ct is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the	project supervisor	during commo
regular meetings a	nd discussions.		
02KM1	Quantum Mechanics 1	Z,ZK	6
Abstract: The lectu	re describes the birth of quantum mechanics and description of one particle and more particles by elements of the Hilbert space as	s well as its time ev	volution. Beside
that it includes des	cription of observable quantities by operators in the Hilbert space and calculation of their spectra.		
	Computer Algebra	KZ	2
12POAL	Computer Algebra	I I	
12POAL Lisp, representation	Computer Algebra n of basic objects (integers, rational and algebraic numbers, polynomials, rational functions, radicals, algebraic functions), arithmetic		∠ reatest commo
Lisp, representation	, · · · · ·	cs, simplification, g	
Lisp, representation divisor, resultant, of	n of basic objects (integers, rational and algebraic numbers, polynomials, rational functions, radicals, algebraic functions), arithmetic	es, simplification, g	ern matching,

| Equations of Mathematical Physics

The subject of this course is solving integral equations, theory of generalized functions, classification of partial differential equations, theory of integral transformations, and solution of

partial differential equations (boundary value problem for eliptic PDE), mixed boundary problem for eliptic PDE). **Bachelor Seminar**

In the first part of the seminar, students familiarize themselves with the general principles of publishing and presenting scientific work and the formal requirements for bachelor's degree projects at the faculty. The second part is designed as a practical training for the defence of the bachelor's degree project. The students give oral presentations of the current state of the research results achieved during the work on their projects. Each presentation is followed by a discussion on scientific matters as well as on the possibilities of improving the student's performance.

01DYKO Introduction to Continuum Dynamics

The course provides a rigorous introduction to the mathematical description of continuum dynamics. In the first part, the necessary mathematical tools are summarized, focusing on vector and tensor calculus, differential forms, and integration on manifolds. Next, the fundamental concepts such as several deformation tensors and the substantial (material) derivative are defined. They are used subsequently in the derivation of the conservation laws of mass, momentum and energy in both integral and differential forms. The conservation laws are further adapted to the specific cases of viscous and inviscid fluid and linear/nonlinear elastic body.

12UPF1 Introduction to Computational Physics 1 Numerical simulation and its role in physics, methodology of writing computer codes. Computer languages for physics. Numerical libraries and program libraries for physics. Computer tools for scientific visualization. Computational fluid dynamics, hydrodynamic simulations, methods for discretization of Euler equations. High-performance computing, parallel computing,

12UPF2 Introduction to Computational Physics 2
Nonlinear models, complex systems, chaotic systems, fractals and their applications in physics. Artificial intelligence methods: neural networks, machine learning, genetic algorithms, expert systems and their applications in physics. Quantum computing. Virtual reality.

12PYTH Scientific Programming in Python

The aim of this course is to learn the fundamentals of the modern Python programming language with a focus on scientific computing. Emphasis is placed on effective solutions to real problems. The course is performed in an interactive form of practical exercises, whose topics can be tailored to the content of other subjects or student theses. Students are also involved in ongoing research. In the introductory part of the course, students learn the basic features of Python?from basic types to object oriented or functional programming. The greater part of the course focuses on specific features of Python for scientific programming. Presented are the main numerical libraries NumPy, SciPy and the Matplotlib graphics library. We show how to generate efficient code, how to combine Python with other languages, what tools are available.

12ZELD Fundamentals of Electrodynamics

Z,ZK

Subject starts by derivation of Maxwell-Lorentz microscopic equations followed by transition to Maxwell macroscopic theory. Using special theory of relativity formulae are found for transformation of field vectors between two inertial systems of coordinates with appropriate invariants. Wave and Helmholtz equations are derived. By expansion into plane monochromatic waves methods of solving these equations are studied in homogeneous media with gradually increasing complexity: isotropic without losses, with absoption, with dispersion, and

11ZFPL Basic to Solid State Physics

ΚZ

2

2

Description of fundamental properties of solids following the regular long distance ordering of atoms in a crystal lattice. Based on the introduced bonding interaction between atoms in solids, various types of crystals and their properties are defined. The model of crystalline lattice dynamics in harmonic approximation is described and basic thermal properties of crystals are derived. The periodic potential of the crystal lattice is introduced and its relation to the following model describing the energetic state of electrons in solids by means of electron energy bands explained. The special consequences of band approach to the physical properties of solids are elucidated. The aim of the course is to systematically introduce and interpret a broad phenomenological basis of physical properties of crystalline solids

non-isotropic. Finally, solution in weakly non-homogeneous madia is presented using the method of eiconal. Individual chapters are illustrated by appropriate examples.

12ZFP Principles of Plasma Physics

Z,ZK

4

Basic physics of high temperature plasmas is explained using particle, kinetic and fluid approaches. It includes drift motions and adiabatic invariants, linear theory of waves in plasmas and propagation of electromagnetic waves in inhomogeneous plasmas. Basic non-linear effects, such as ponderomotive force, self-focusing and parametric instabilities are explained. It comprises brief introduction into magnetohydrodynamics and nuclear fusion. Basics of atomic physics od multiply-ionized plasmas are introduced.

12ZAOP Fundamentals of Optics

Z,ZK

2

The lecture covers the very basics of optics - electromagnetic theory, linear optical physics and material effects, basics of nonlinear effects, and geometrical optics. The main goal of the lecture is to obtain, on the bachelor level, broad and general information on optics, giving an essential orientation in the field, especially with respect to character of the bachelor work. Particular topics are further elaborated during departmental masters program. The lecture stems from the electrodynamic notion of plane waves in vacuum (including polarization effects), and further from material medium. It explains basics of linear and nonlinear response in material medium and dispersion properties. It next informs on consequences in anisotropic media, it explains processes induced by boundary conditions at interfaces. It also discusses the consequences of statistics on interference processes, explains elements 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.

Name of the block: Compulsory elective courses

Minimal number of credits of the block: 0

The role of the block: PV

Code of the group: BSSPOLVEDY

Name of the group: BS - Social Sciences

Requirement credits in the group:

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

Credits in the group: 0

Note on the group:

Only one of these courses is obligatory.

J 1						
Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
00EKOT	Economy in Technology Jana Ková ová	Z	1	2+0		PV
00ETV	Ethics of Science and Technology Jakub Hají ek Jana Ková ová	Z	1	0+2	L	PV
00RET	Rhetoric Jana Ková ová Jana Ková ová	Z	1	0+2		PV
00UPRA	Introduction to Law Martin ech Jana Ková ová	Z	1	0+2		PV
00UPSY	Introduction to Psychology Jakub Hají ek Jana Ková ová	Z	1	0+2		PV

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

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

Code of the group: BSPJAZYKYZK Name of the group: BS P languages Requirement credits in the group:

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

Credits in the group: 0 Note on the group:

information is to be obtained from the teacher.

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 V ra Šlechtová	ZK	3		L	PV

04XSZZK		Spanish for Beginners Examination V ra Šlechtová	ZK	3		L	PV
Characteristics	of the	courses of this group of Study Plan: Code=BSPJAZYKYZK Na	ame=BS P la	nguages			
04XAMZK	Eng	glish for Intermediate Students Examination				ZK	4
The course content	is the exa	amination as given by the study plan. The examination covers the AM1, AM2, and AM	3 courses and co	nsists of two	parts - writ	ten (100 min) and oral
(20-30 min). The stu	ident is e	xpected to master the AM syllabus and demonstrate the ability to apply their knowled	ge gained in the tl	hree English	courses.		
04XAPZK	Eng	glish for Advanced Students Examination				ZK	4
The course content	is the exa	amination as given by the study plan. The student is supposed to demonstrate masterin	ng the AP3 syllabu	us and the al	ility to appl	y their knowl	edge obtained
in the three AP cour	ses. The	examination consists of 2 parts - written (110 min) and oral (30 min) and includes also	o oral presentatio	n of a topic f	rom the stu	dent's field o	of study.
04XCESZZK	Cze	ech for Foreigners – Beginners - Examination				ZK	4
The course content	is the exa	amination as given by the study plan. The examination consisting of a written and oral	part covers all the	e topics of th	e 04XCES	Z1,2,3 cours	es and can
only be taken after s	successfu	al completion of all three courses. Detailed information is to be obtained from the teach	ner.				
04XCESMZK	Cze	ech for Intermediate Students Examination				ZK	4
The course content	is the exa	amination as given by the study plan. The examination consisting of a written and oral	part covers all the	e topics of th	ie CESM1,2	2,3 courses a	and can only
be taken after succe	essful cor	npletion of the 3 courses. Detailed information is to be obtained from the teacher.					
04XCESPZK	Cze	ech for Foreign Students - Advanced Examination				ZK	4
The course content	is the exa	amination as given by the study plan. The examination consisting of a written and oral	part covers all the	e topics of th	ie CESP1,2	2,3 courses a	nd can only
be taken after succe	essful cor	npletion of the 3 courses. Detailed information is to be obtained from the teacher.					
04XFMZK	Fre	nch for Intermediate Students Examination				ZK	4
The content is the e	xaminatio	on as given by the study programme. The whole French programme is ended with an e	examination cove	ring the cont	ents of FM	1-FM3. The e	xamination
consists of a written	and oral	part and is organized according to Examination Instructions, a document available or	the web.				
04XFPZK	Fre	nch for Advanced Students Examination				ZK	4
The whole French p	rogram is	s ended with an examination covering the contents of FP1-FP3. The examination cons	ists of a written a	nd/or an ora	l part and is	s organized a	according to
Examination Instruc	tions, a d	locument available on the web. Assessment of the presentation is included into the ex	amination grading] .			
04XFZZK	Fre	nch for Beginners Examination				ZK	3
The content is the e	xaminatio	on as given by the study plan. The course is terminated with an examination consisting	g of oral and writte	en part. The	examinatio	n is ruled by	the document
Instruction for exam	ination. It	s content covers the levels FZ1 - FZ5.					
04XNMZK	Ge	rman for Intermediate Students Examination				ZK	4
The course content		amination as given by the study plan. The whole German for Intermediate Students Co	urse is completed	by an exam	nation cons	sisting of two	parts - written
and oral, which cove	er the cou	urses NM1 - NM3. The oral part follows after passing the written part successfully and	after obtaining th	e 04NM3 as	sessment. I	More detailed	information t
is to be obtained fro	m the tea	acher.					
04XNPZK	Ge	rman for Advanced Students Examination				ZK	4
The course content	is the exa	amination as given by the study plan. The whole German for Advanced Students Cour	se is completed b	y an examir	ation consi	sting of two	parts - written
and oral, which cove	er the cou	urses NP1 - NP3. The oral part follows after passing the written part successfully and	after obtaining the	e 04NP3 ung	raded asse	ssment. Mor	e detailed

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 known	vledge and skills a	cquired 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 instruc	tions by the teache	er.
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 known	vledge and skills a	cquired 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 instruct	ions by the teacher	r.
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 known	vledge and skills a	cquired 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 instructi	ons by the teacher	
04XSMZK	Spanish for Intermediate Students Examination	ZK	4
The course content	s the examination as given by the study plan. SMZK examination consists of two parts - written and oral; to be eligible for the writte	n part, students w	ill have obtained
non-graded assess	nent for course SM3.Oral examination follows the written part.		
04XSPZK	Spanish for Advanced Students Examination	ZK	4
The course content	s the examination as given by the study plan. Examination SPZK consists of two parts, namely oral and written. The prerequisite	for admission to or	al part is having
passed the written t	est. 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 the examination as given by the study plan. Examination consists of two parts - written and oral. Student can register for oral	examination only if	he/she has
passed the written			

Name of the block: Elective courses Minimal number of credits of the block: 0

The role of the block: V

Code of the group: BSPFIPFV

Name of the group: BS P_FIB PF Optional courses

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)	Completion	Credits	Scope	Semester	Role
 12AUX	Tutors, authors and guarantors (gar.) Administration of UNIX System	KZ	2	2+0	L	V
02DEF2	Milan Ši or Milan Ši or Milan Ši or (Gar.) History of Physics 2 Igor Jex Miroslav Myška Igor Jex (Gar.)	Z	2	2+0	L	V
02PRA1	Experimental Laboratory I Libor Škoda, Katarína K ížková Gajdošová, Barbara Antonina Trzeciak, 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	٧
B0B36JUL	Julia for optimization and learning Lukáš Adam, Václav Mácha Lukáš Adam Lukáš Adam (Gar.)	KZ	4	1P+3C	Z	V
04AKS	English Conversation Jana Ková ová Jana Ková ová (Gar.)	Z	1	0+2	L	٧
02KM2	Quantum Mechanics 2 Martin Štefa ák Martin Štefa ák (Gar.)	Z,ZK	6	4P+2C	L	٧
00MAM1	Essentials of High School Course 1 David Be Martin Stefa ák	Z	1	0+1		٧
00MAM2	Essentials of High School Math Course 2 Lukáš Heriban Severin Pošta Lukáš Heriban (Gar.)	Z	1	0+1		٧
12MOF	Molecular Physics Jan Proška, Martin Michl Martin Michl Jan Proška (Gar.)	ZK	2	2+0	L	٧
12NT	Nanotechnology Jan Proška, Eduard Hulicius Jan Proška Eduard Hulicius (Gar.)	ZK	2	2+0	Z	٧
15CH1	General Chemistry 1 Ond ej Holas, Petr Distler, Václav uba Petr Distler Petr Distler (Gar.)	Z	3	2+1	Z	٧
15CH2	General Chemistry 2 Ond ej Holas, Petr Distler, Václav uba Petr Distler Petr Distler (Gar.)	Z,ZK	3	2+1	L	٧
01PGR1	Computer Graphics 1 Pavel Strachota Pavel Strachota (Gar.)	Z,ZK	2	1P+1C		٧
01PGR2	Computer Graphics 2 Pavel Strachota Pavel Strachota (Gar.)	Z,ZK	2	1P+1C		٧
01SITE1	Computer Networks 1 Miroslav Minárik Miroslav Minárik (Gar.)	Z	2	1+1	Z	٧
01SITE2	Computer Networks 2 Miroslav Minárik Miroslav Minárik (Gar.)	Z	2	1+1	L	٧
18PROP	Practical training in programming Jakub Klinkovský Jakub Klinkovský (Gar.)	KZ	3	2C	Z	V

18PJ	Programming in Java Miroslav Virius Miroslav Virius (Gar.)	Z,ZK	5	2P+2C	Z	V
01PSL	LaTeX - Publication Instrument Petr Ambrož Petr Ambrož Petr Ambrož (Gar.)	Z	2	0+2	L	V
11SFIPL	Seminar on Solid State Physics Ladislav Kalvoda Ladislav Kalvoda (Gar.)	KZ	2	1+1		V
02SMF	Seminar of Mathematical Physics Martin Štefa ák Ladislav Hlavatý (Gar.)	Z	2	0+2	Z	V
01SOS1	Software Seminar 1 Zden k ulík Zden k ulík Zden k ulík (Gar.)	Z	2	0+2	Z	V
01SOS2	Software Seminar 2 Zden k ulík Zden k ulík Zden k ulík (Gar.)	Z	2	0+2	L	V
TV-1	Physical Education	Z	1		Z	٧
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
14TED	Creating Electronic Documents Aleš Materna Aleš Materna (Gar.)	Z	2	26C		V
12UFN	Introduction to Photonics and Nanostructures Ivan Richter, Pavel Kwiecien, Jan Proška Ivan Richter Ivan Richter (Gar.)	KZ	3	2P+1C	L	V
12ULTB	Introduction to Laser Technique Helena Jelínková, Jan Šulc, Michal N mec Jan Šulc Helena Jelínková (Gar.)	KZ	3	2P+1C	L	V
01UP1	Introduction to Probability 1 Jan Vybíral 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
12VTV	Scientific and Technical Computing Ivan Procházka Ivan Procházka Ivan Procházka (Gar.)	Z	2	1+1	L	V
18ZALG	Basics of Algorithmization Vladimír Jarý, Miroslav Virius, Petr Pauš, František Vold ich, Zuzana Pet í ková, František Gašpar Vladimír Jarý Miroslav Virius (Gar.)	Z,ZK	4	2+2	L	V
12ZEL1	Basic Electronics 1 Jaroslav Pavel Jaroslav Pavel (Gar.)	Z,ZK	3	2+1	Z	V
12ZEL2	Basic Electronics 2 Jaroslav Pavel Jaroslav Pavel (Gar.)	Z,ZK	3	2+1	L	V
12ZFS	Fundamentals of Photonic Structures Ivan Richter, Ji í tyroký Ivan Richter Ivan Richter (Gar.)	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
02ZJFB	Nuclear Physics B Vladimír Wagner Martin Štefa ák Vladimír Wagner (Gar.)	KZ	3	3+0	Z	V
01ZPB1	Introduction to Computer Security 1 Petr Voká Petr Voká Petr Voká (Gar.)	Z	2	1+1		V
12ZFD	Physical Data Visualization Josef Blažej Josef Blažej (Gar.)	KZ	2	1P+1C	Z	V
Characteristics of	the courses of this group of Study Plan: Code=BSPFIPFV Name=I	BS P FIB PF	Option	al courses	3	
12AUX	Administration of UNIX System	<u>_</u> <u>_</u>	3 3 3 1		KZ	2
Socia and mara advance	and administration of Universating avetem				•	

12/10/1	Transmittation of Ortize Cyclom	1 1	_
Basic and more advance	ed administration of Unix operating system		
02DEF2	History of Physics 2	Z	2
Development of classical	al mechanics after Newton, Bernoulli's, Euler, Lagrange. Historical development of optics, corpuscular and wave approach. E	lectricity and mag	netism -
electrostatics, galvanisn	n, electrodynamics and electromagnetism, Faraday and Maxwell. Thermodynamics and its laws, statistical physics, Boltzmar	n. The birth of mo	dern quantum
and relativistic physics,	Planck and Einstein. Discovery of radioaktivity, structure of atom, atomic nucleus, Rutherford and Bohr. The way to nuclear e	nergy, Elementary	y particles,
standard model. The co	ncept of Nature and Universe of today.		
02PRA1	Experimental Laboratory 1	KZ	6
Lecture is intended espe	ecially for students who intend to study some of the physical specializations of FNSPE(branch Physical Engineering, Nuclea	r Engineering). Bu	it it can be also
attended by students into	erested in the otherspecializations. In Experimental laboratory students learn how to prepare for experiments (including work wit	h theliterature), the	e implementation
of the measurement (ac	equire of different experimental procedures and routines), willteach writing the records of measurement, processing and evalu	uation of results. A	at the same time
practically extendthe kn	owledge gained in lectures on physics.		
02PRA2	Experimental Laboratory 2	KZ	6
Lecture is intended espe	ecially for students who intend to study some of the physical specializations of FNSPE(branch Physical Engineering, Nuclea	r Engineering). Bu	it it can be also
attended by students into	erested in the otherspecializations. In Experimental laboratory students learn how to prepare for experiments (including work wit	h theliterature), the	e implementation
of the measurement (ac	equire of different experimental procedures and routines), willteach writing the records of measurement, processing and evalu	uation of results. A	at the same time
practically extendthe kn	owledge gained in lectures on physics.		

Julia programming language is increasingly known by the community for its suitability in the field of numerical calculations. The course consists of two parts. The first part presents the basics of Julia. The second part introduces mathematical optimization and its application in machine learning, statistics and optimal control of differential equations. While the first part shows the individual concepts of Julia, the second part combines them into longer logical sections of code. We explain each application theoretically. Students are encouraged both to write simple functions by themselves and compare them with already existing packages. The course ends with a final project. Students can either choose a topic connected to their theses or join a Kaggle competition with real data. This course is also part of the inter-university programme prg.ai Minor. It pools the best of Al education in Prague to provide students with a deeper and broader insight into the field of artificial intelligence. More information is available at https://prg.ai/minor.

Julia for optimization and learning

04AKS	English Conversation	Z	1
	the student's communication skills acquired throughout their previous studies. It aims to improve all aspects of oral commun		nt will develop
<u>-</u>	bus communication situations and will master their communication strategy. They will also practise their listening skills in order		
-	ent will be trained to express their ideas clearly and according to current English usage, and become a more confident speal		
02KM2	Quantum Mechanics 2	Z,ZK	6
Abstract: The lecture ex	pands the introduction to quantum mechanics with more general formalism of quantum theory, approximate methods and par	th integral. It sumn	narizes the
•,	Is used in various applications of quantum mechanics and prepares the students for an effective scientific research and further	study, in particula	r, of the modern
formulations of quantum	·		
00MAM1	Essentials of High School Course 1	Z	1
00MAM2	Essentials of High School Math Course 2	Z	1
Review of basics of high			
12MOF	Molecular Physics	ZK	2
	mic molecules and molecular matter, and on structure-to-physical properties relations. Methods of molecular structure determined to the control of the contr	1	
12NT	Nanotechnology	ZK	2
	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 technok on. Particular emphasis will be focused on detail characterization of "in situ" and "ex situ" techniques, their applications for he	•	
	as well. Some supportive technical methods - lithography, diffusion, evaporation, ion implantation, contact and dielectric la		
as well as soldering and			
15CH1	General Chemistry 1	Z	3
The most important con	cepts, quantities and units used in chemistry are introduced in the course General Chemistry I. Their significance and practic	al use are illustrat	ed by examples
solved in exercises.			
15CH2	General Chemistry 2	Z,ZK	3
The subject is the contin	nuation of the course General chemistry I. The main attention is paid to general principles governing chemical processes. Usi	ng various exampl	es, the fact that
	ciples is not restricted only to chemical processes is documented. The significance and practical use of explained principles	are illustrated by e	xamples solved
in exercises.			
01PGR1	Computer Graphics 1	Z,ZK	2
•	semester "Computer Graphics" course is devoted to the specifics of digital display devices spanning from history up to the sta		-
•	problems in 2D computer graphics is given together with their solutions. Focus is put on mathematical description of problems an Edge previously obtained in a variety of subjects available at FNSPE. The final part of the course covers the applications of co	•	
= =	scientific documents and presentations.	inputer grapinos a	approacties in
01PGR2	Computer Graphics 2	Z,ZK	2
-	wo-semester "Computer Graphics" course begins with a brief introduction to signal theory in the context of aliasing - a pheno		l l
•	structured survey of fundamental problems in 3D computer graphics is given together with their solutions, from the description		
rendering. Focus is put	on mathematical description of problems and explanation of the corresponding algorithms using knowledge previously obtained	d in a variety of su	bjects available
•	n implementation aspect such as data structures design etc. is also a matter of concern. In the last lecture, a number of theor	etical concepts ar	e demonstrated
	source 3D modeling and rendering software instrument.		
01SITE1	Computer Networks 1	Z	2
-	ry and present network (LAN, WAN, use the principles and technologies). Architecture of reference model ISO/OSI. Network	•	
	. Internet services - mail, remote access, www. Secure communication, tunneling. Directory services, certificates, certification a etwork security - firewalls (packet filters, proxies, gateways, NAT, DMZ), practical exercises. (According to the interest - the se		•
01SITE2	Computer Networks 2	Z	2
	ry and present network (LAN, WAN, use the principles and technologies). Architecture of reference model ISO/OSI. Network		
-	. Internet services - mail, remote access, www. Secure communication, tunneling. Directory services, certificates, certification a	•	
(PKI). Use in practice. N	etwork security - firewalls (packet filters, proxies, gateways, NAT, DMZ), practical exercises. (According to the interest - the se	erial control lines,	modems)
18PROP	Practical training in programming	KZ	3
The goal of this course	s to understand advanced topics related to programming, code design and software project development. Students will pract	ice pragmatic tech	nniques and
	eal-world examples. Emphasis is put on the review of freely available software tools that can improve the programmer's work	efficiency and ens	ure high quality
of the final source code.			
18PJ	Programming in Java	Z,ZK	5
	o the Java platform and to the development of the basic types of applications for this platform.		_
01PSL	LaTeX - Publication Instrument	Z	2
	to the basics and facilities of computer typography, particularly to the system LaTeX		
11SFIPL	Seminar on Solid State Physics	KZ	2
	minar and ?SSS? software features. 2.Module "bravais" - crystal structure and X-ray diffraction in 2D ? theory 3.Simulations of stal lattice versus crystal structure, primitive cell, elementary cell, lattice plane, reciprocal grid, Laue and Bragg condition, ato	•	
	al structural analysis 4.Module "laue" - Diffraction on perfect and imperfect crystals 5.Simulations: influence of structural disorder	_	
· · · · · · · · · · · · · · · · · · ·	, quasi crystals 6."born" module - dynamics of crystalline grid in 1D ? theory 7.Simulations: planar waves, traveling and stand	=	
	momentum transport, infinite chain, chain of finite lenght, boundary conditions, wave packets, group and phase velocity, disper-	-	
localized modes, anhari	nonicity 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 e	xternal electric fiel	ld, Haynes and
· ·	ectron mobility, electron motion in magnetic field, cyclotron frequency, Hall experiment, magnetorezistence 12.Assignment, e	aboration and pre	sentation of the
seminar work.	Consider of Mathematical Dhydia		
02SMF	Seminar of Mathematical Physics	Z	2
			simple tasks
	inar is to iluminate mathematical physics by virtue of solved examples. It is supposed that the teachers of the physics depart ic activities that could become the topics of the student's bachelor theses in the next year.	ment will present :	.
concerning their scientif	ic activities that could become the topics of the student?s bachelor theses in the next year		
concerning their scientif	ic activities that could become the topics of the student?s bachelor theses in the next year Software Seminar 1	Z	2
concerning their scientif 01SOS1 Java, Java Beans, Asse	ic activities that could become the topics of the student?s bachelor theses in the next year Software Seminar 1 mbly language programming for microprocessors Intel 80x86	Z	2
concerning their scientif 01SOS1 Java, Java Beans, Asse 01SOS2	ic activities that could become the topics of the student?s bachelor theses in the next year Software Seminar 1 mbly language programming for microprocessors Intel 80x86 Software Seminar 2	Z	2
concerning their scientife 01SOS1 Java, Java Beans, Asse 01SOS2 Graphical libraries GTK	ic activities that could become the topics of the student?s bachelor theses in the next year Software Seminar 1 mbly language programming for microprocessors Intel 80x86	Z	2
concerning their scientife 01SOS1 Java, Java Beans, Asse 01SOS2 Graphical libraries GTK	ic activities that could become the topics of the student?s bachelor theses in the next year Software Seminar 1 mbly language programming for microprocessors Intel 80x86 Software Seminar 2 + and Qt. Development of graphical user interface using C and C++ programming languages. Portable applications for Unix li	Z Z	2
concerning their scientife 01SOS1 Java, Java Beans, Asse 01SOS2 Graphical libraries GTK for Linux systems. Portal	ic activities that could become the topics of the student?s bachelor theses in the next year Software Seminar 1 mbly language programming for microprocessors Intel 80x86 Software Seminar 2 + and Qt. Development of graphical user interface using C and C++ programming languages. Portable applications for Unix libility to Microsoft Windows.	Z	2 ems, especially

TV-3	Physical education	Z	1
TV-4	Physical education	Z	1
14TED	Creating Electronic Documents	Z	2
	ing and presenting student theses. Individual exercises focus on creating and formatting texts, equations, charts, tables, prese		
office suite.			
12UFN	Introduction to Photonics and Nanostructures	KZ	3
_	uctures and nanotechnologies; quantum technologies; quantum nanostructures; photonic structures; nanophotonics and nano	1 1	aveguides and
	otonics; computer simulations; technological realization; student presentations	, , ,	Ü
12ULTB	Introduction to Laser Technique	KZ	3
	nagnetic radiation sources; laser principle; classification of lasers; characterization and rough application of various types of la	1	-
	vitching, mode-locking.		
)1UP1	Introduction to Probability 1	Z,ZK	3
	finite set of possible results, classical probability, independent random events 2. Probability and combinatorics 3. Probability and	1	
1.Conditional proba	bility, Bayes' theorem, medical diagnosis, Simpson's paradox 5.Random variable with discrete state space, its distribution and	mean value 6.Proble	ms involving
he calculation of m	ean value 7.Probabilistic method in graph theory 8.Random algorithms, Morris algorithm and its variants		
01UP2	Introduction to Probability 2	Z,ZK	3
. One-dimensional	continuous random variable and its statistical description. 2. Distribution function and probability density. 3. Axiomatic introduct	tion of probability and	connection to
neasure theory. 4. I	lumerical characteristics of continuous random variables. 5. Selected variants of continuous distributions and their characterist	tics. 6. Elementary me	thods for poin
estimations. 7. Gen	rating pseudorandom numbers from the selected distribution.		
2VTV	Scientific and Technical Computing	Z	2
The students get fa	niliar with methods of solving of computational problems in the scientific and technical practice, and with methods of their prog	ramming. The course	is oriented
nainly to programm	ing in the Fortran language.		
18ZALG	Basics of Algorithmization	Z,ZK	4
This course is devo	ed to selected algorithms and methods for algorithm design. This course intruduces selected methods for the determination of	the algorithm comple	exity.
12ZEL1	Basic Electronics 1	Z,ZK	3
The subject provide	s primary knowledge of circuit theory concerning principles of electronic circuits in both stationary and harmonic stable state. C	Circuit analysis metho	ds for linear
circuits include sym	polic and complex method are explained. Proper circuit analysis is also lectured. The subject's final part deals with transient eff	fects inside linear circ	uits.
12ZEL2	D : El + : 0		
	Basic Electronics 2	Z,ZK	3
The subject follows	Basic Electronics 2 Up with the Basic Electronics 1. Semiconductor elements basic properties are explained. Thecourse's final part deals with basi	1 / 1	_
-		1 / 1	-
12ZFS	up with the Basic Electronics 1. Semiconductor elements basic properties are explained. Thecourse's final part deals with basi	ic themes of logical ci	rcuits field.
12ZFS The lecture covers Specifically, the lect	with the Basic Electronics 1. Semiconductor elements basic properties are explained. Thecourse's final part deals with basing Fundamentals of Photonic Structures The basics of photonic structures, it classifies photonic structures compares them with the electronic structures, summarizes the summarizes the basic physics and technology of optical waveguides; it introduces basic linear, nonlinear, and active structures	ic themes of logical ci Z,ZK eir preparation and ches of integrated photo	rcuits field. 2 naracterization nics for
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Teleptore is designated by the lecture is des	Fundamentals of Photonic Structures ne basics of photonic structures, it classifies photonic structures compares them with the electronic structures, summarizes the ure discusses the basic physics and technology of optical waveguides; it introduces basic linear, nonlinear, and active structures all communications and sensors. Next, the attention is given to introduction of plasmonic structures and plasmonics, periodic structures, and finally to photonic structures for quantum technologies. Finally, the lecture is closed with student presentations of electronic laboratories. Foundations of Physical Measurements 1 need for students of physical specializations (Experimental particle physics, Physical engineering, Nuclear engineering), however goal of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired in a physics lab. Foundations of Physical Measurements 2 need for students of physical specializations (Experimental particle physics, Physical engineering, Nuclear engineering), however goal of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired in a physics lab.	ic themes of logical cic Z,ZK eir preparation and ches of integrated phototructures and photonion selected relevant to ZK er, it can be attended didata on a PC. Stude KZ er, it can be attended	rcuits field. 2 paracterization nics for c crystals, opics and 2 by students onts learn the 4 by students o
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T2ZFS The lecture covers of Specifically, the lecture period of the lecture in the lecture in the lecture is designated of the lectu	Fundamentals of Photonic Structures ne basics of photonic Structures, it classifies photonic structures compares them with the electronic structures, summarizes the true discusses the basic physics and technology of optical waveguides; it introduces basic linear, nonlinear, and active structure all communications and sensors. Next, the attention is given to introduction of plasmonic structures and plasmonics, periodic structures, and finally to photonic structures for quantum technologies. Finally, the lecture is closed with student presentations of ed photonic laboratories. Foundations of Physical Measurements 1 need for students of physical specializations (Experimental particle physics, Physical engineering, Nuclear engineering), however goal of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired in a physics lab. Foundations of Physical Measurements 2 need for students of physical specializations (Experimental particle physics, Physical engineering, Nuclear engineering), however goal of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired in a physics lab. Nuclear Physics B resents formidable challenges both experimentally and theoretically, simply because we are dealing with the submicroscopic of the behaviour of objects fails us. The lecture is a basic introduction to very interesting regions of subatomic physics.	ic themes of logical cic Z,ZK eir preparation and ches of integrated photostructures and photonion selected relevant the ZK er, it can be attended did data on a PC. Stude KZ er, it can be attended did data on a PC. Stude	rcuits field. 2 paracterization nics for c crystals, opics and 2 by students onts learn the 4 by students onts learn the 3 of our classical
12ZFS The lecture covers Specifically, the lect applications in optic metamaterials, met excursions to select 02ZM1 The lecture is design other branches. The basic habits of work 02ZM2 The lecture is design other branches. The basic habits of work 02ZJFB This scientific field	Fundamentals of Photonic Structures The basics of photonic Structures are explained. The course's final part deals with basic purpose by the basics of photonic Structures, it classifies photonic structures compares them with the electronic structures, summarizes the surfaces and sensors. Next, the attention is given to introduces basic linear, nonlinear, and active structures are communications and sensors. Next, the attention is given to introduction of plasmonic structures and plasmonics, periodic structures, and finally to photonic structures for quantum technologies. Finally, the lecture is closed with student presentations of photonic laboratories. Foundations of Physical Measurements 1 The deformation of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired in a physics lab. Foundations of Physical Measurements 2 The deformation of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired in a physics lab. Foundations of Physical Measurements 2 The deformation of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired in a physics lab. Nuclear Physics B The deformation of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired in a physics lab. Nuclear Physics B The deformation of the experimental particle physics, physical engineering, processing and evaluation of acquired in a physics lab.	ic themes of logical cic Z,ZK eir preparation and ches of integrated photos tructures and photonion selected relevant the consecuency of the cons	rcuits field. 2 paracterization nics for c crystals, opics and 2 by students o nts learn the 4 by students o nts learn the 3 of our classica
12ZFS The lecture covers of Specifically, the lect applications in option metamaterials, met execursions to select 22ZM1 The lecture is designated about the branches. The basic habits of work 22ZM2 The lecture is designated by the branches. The basic habits of work 22ZJFB This scientific field intuition regarding the second and the second accordance to the second accor	Fundamentals of Photonic Structures ne basics of photonic Structures, it classifies photonic structures compares them with the electronic structures, summarizes the true discusses the basic physics and technology of optical waveguides; it introduces basic linear, nonlinear, and active structure all communications and sensors. Next, the attention is given to introduction of plasmonic structures and plasmonics, periodic structures, and finally to photonic structures for quantum technologies. Finally, the lecture is closed with student presentations of ed photonic laboratories. Foundations of Physical Measurements 1 need for students of physical specializations (Experimental particle physics, Physical engineering, Nuclear engineering), however goal of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired in a physics lab. Foundations of Physical Measurements 2 need for students of physical specializations (Experimental particle physics, Physical engineering, Nuclear engineering), however goal of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired in a physics lab. Nuclear Physics B resents formidable challenges both experimentally and theoretically, simply because we are dealing with the submicroscopic of the behaviour of objects fails us. The lecture is a basic introduction to very interesting regions of subatomic physics.	ic themes of logical cic Z,ZK eir preparation and ches of integrated photostructures and photonion selected relevant the ZK er, it can be attended did data on a PC. Stude KZ er, it can be attended did data on a PC. Stude	rcuits field. 2 paracterization nics for c crystals, opics and 2 by students c nts learn the 4 by students c nts learn the 3 of our classical

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:

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Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
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
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 V ra Šlechtová V ra Šlechtová (Gar.)	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 V ra Šlechtová	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 V ra Šlechtová	Z	2	0+2	Z	V
04XFZ1	French for Beginners Z1	Z	2	0+4	L	V
04XFZ2	V ra Šlechtová V ra Šlechtová (Gar.) 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	Z	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		-	_		-
	Miloslava echová Miloslava echová (Gar.) German for Advanced Students P3	Z	2	0+2	L	V
04XNP3	V ra Šlechtová Russian for Intermediate Students M1	Z	2	0+2	Z	V
04XRM1	V ra Šlechtová Zhanna Isaeva (Gar.)	Z	2	0+2	Z	V
04XRM2	Russian for Intermediate Students M2 Zhanna Isaeva Zhanna Isaeva (Gar.)	Z	2	0+2	L	V
04XRM3	Russian for Intermediate Students M3 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 V ra Šlechtová	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 Beatriz Vadillo Gonzalo (Gar.)	Z	2	0+2	L	V
04XSP3	Spanish for Advanced Students P3 V ra Šlechtová	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 th	ne courses of this group of Study Plan: Code=BSPJAZYKYZAP	Name=BS P i	iazvky za	ın		
extending the knowledge of O4XAM2 E The AM2 course expects that and lexical items typical of revision is included. O4XAM3 E The course develops the structure of profession equivalents. The course also student's field.	en communication situations. Thus it covers topics related to the student's life and needs of grammar issues used in EAP. Inglish for Intermediate Students M2 the student to have completed the AM1 course. It develops their skills for work with subte ESP and EAP (e.g., definition, existence and classification of phenomena, object descriptinglish for Intermediate Students M3 kills that enable students to cope with features typical of professional style. Increasing attentional texts. Great emphasis is placed on distinguishing different levels of formal and information includes studying abstracts and rules for writing them as well as basic rules for preparatinglish for Advanced Students P1 students who have successfully completed the full secondary school English language	echnical texts, foc tions). Part of the o ention is paid to de mal oral and writte tring and giving a	using also no course is also eveloping sulten communions short preser	o guided wri	Z right of the control of the cont	2 functions, ary, gramma 2 independer te Czech related to th
grammar, and style typical covers professional oral an polite request). If necessar 04XAP2 ETHE AP2 course is based of the students' needs it cond of descriptions, and, if pos	es - CEFR). It provides an introduction into English for Specific and Academic Purposes of professional oral and written communication situations (fundamentals of terms in mad written communication on topics related to the undergraduate's life and needs. It develoy, revision of selected grammar topics is included. Inglish for Advanced Students P2 In AP1, thus extending the student's skills for working with subtechnical texts, and even centrates on chosen grammar topics, but mainly intends to develop understanding of sy sible, a case study). Increasing emphasis is placed on the undergraduate's independent undent's subtechnical vocabulary, and includes fundamental notions of chosen branches	thematics and ph ps skills for free pr with professional ntactic structures it work with and re	ysics, definition of texts of chorand typical incoming of ling	tions, graph vriting (writing) osen branche rhetorical fur guistically m	g a CV, letter of Z es of science. nctions (e.g., ore demanding)	etc). It also of application 2 According to various type no materials.
paragraph structure, linking	g, cohesion and coherence in texts.					
The AP3 course is based of communication skills and f	nglish for Advanced Students P3 on AP2 and expects the student to work without any guidance with authentic professional unctions (e.g., expressing an opinion, agreement, and objections; taking part in discuss a given or chosen topic and presenting it. The course places emphasis on distinguishir	ion, note-taking; s	summarizing	ı, writing an	abstract) and,	if possible,
The course is designed for acquire basic language an communicative situations. A1 (CEFR) approximately.	Ezech for Foreigners - Beginners 1 students on the English programme. Students will become acquainted with the main ch d speaking skills. The course focuses on pronounciation exercises, simple social phrase The course covers roughly lessons 1-5 in "Chcete mluvit esky" by H. Remediosová and	es, and oral and w	ritten comm	unication in	the most com students will I	nmon nave reache
The language and commun	Ezech for Foreigners - Beginners 2 nication competences acquired in CESZ1 are further developed. Students extend their k t topics. The course covers roughly lessons 6-10 in "Chcete mluvit esky" by H. Remedic approximately.	-				· ·
The course further develop correct pronunciation, deep	Ezech for Foreigners - Beginners 3 so the language and communication competences acquired in the XCESZ1 and XCESZ pening grammar, including grammar practice, and introducing Czech culture. Students a stise understanding texts in terms of main ideas or looking for specific details in texts. The	are asked to produ	ice simple te	exts and the	y practise free	quent types
	zech for Foreigners - Intermediate 1 orrect pronunciation, important morphological phenomena, prepositional phrases, and ve	erb forms as well a	s on extend	ing the stude	Z ent's vocabula	2 ary for variou
04XCESM2 C	Exech for Foreigners - Intermediate 2 ppics covered in CESM1 and is then focused on more difficult grammar phenomena. It p abbreviations, abbreviated words, and mathematical terms and formulas.	oractices writing, s	speaking, an	d reading sk	Z kills and trains	2 the student

in understanding common abbreviations, abbreviated words, and mathematical terms and formulas.

04XCESM3 Czech for Foreigners - Intermediate 3	Z	2
The last course revises morphological topics covered earlier and extends the student's knowledge of more difficult language phenomena. It is especially	cially focused on st	ylistics and
lexicology and on developing the student's writing skills.		
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 Ei		
It is focused partly on revision of standard language structures, but mainly on practising more complex grammatical structures typical of the style of	science. Students a	are taught the
basics of functional style of engineering and professional communication, both in spoken and written form. The topics include University Studies and	Student Life. Writt	en practice
includes communication with teachers and faculty administrators.		
04XCESP2 Czech for Foreigners - Advanced 2	Z	2
This course extends the student's knowledge acquired in CESP1 and focuses on difficult language phenomena. It practises working with technical a	and specialist texts	placing greater
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		
04XFM2 French for Intermediate Students M2	7	2
Course FM2 builds on FM1. Linguistic structures and competence acquired in previous study are systemized and expanded. Reading popular science	texts features typic	_
and scientific language (passives, nominalization, word formation). Topics: physics, power engineering, environment, Internet, success of French scientific		
scientists, artists and architects. Description of an object, device, shapes, dimensions, material.	onoc and technolog	97, 1 1011011
04XFM3 French for Intermediate Students M3	Z	2
I I		
The course is focused on improvement and further development of linguistic competence acquired during the follow-up courses. Syntactic structures (
participle structures, compound tenses). Text summaryStudents prepare a written paper which will be delivered in form of an oral presentation in-cl		
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	-	French articles
and one's own knowledge/experienceLonger monologues on topics /situations set for the examination are prepared. Text structure, cohesion and one's own knowledge/experienceLonger monologues on topics /situations set for the examination are prepared. Text structure, cohesion and one's own knowledge/experience.	conerence.	_
04XFP1 French for Advanced Students P1		2
FP advanced course The objective of this three-semester course is to improve and further develop communication in the French language in both wi		
be able to communicate in social interaction and in academic, scientific and work environment. They will be able to use the language to transmit general sections and in a cademic section and the section and		
to solve problems. FP1 The course builds on and further develops linguistic competence acquired at secondary school. Difficult grammar topics are re-	•	-
passé composé-imparfait, pronouns. The following specific topics are covered: University studies in our country and in France, writing of transactiona	· ·	
request, answer to an advert, environmental issues, success of French science and technology, chosen topics from French regional culture, Paris. Top	ics of specialization	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	tures typical of
With the link to P1 contents, the course further develops language skills. Focus is put on reading popular science texts and on oral communication of technical and scientific communication are stressed (passive voice, nominalization, word formation).	n given topics. Fea	tures typical of
	n given topics. Fea	atures typical of
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04XNM1	German for Intermediate Students M1	Z	2
-	rse is to level off the students´ skills in the German language. The course focuses on revision of more difficult phenomena an es (e.g. importance of verb prefixes). In the lexical part, it covers topics referring to higher education in both the Czech Repu		
· ·	gether with all necessary expressions and phrases, expressions and phrases needed to chemists, mathematicians, physicis	-	
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
	ther more complex grammatical structures and their application in communication based on technical texts, such as the relation ng of the 21st century, linguistically more demanding texts on the environment, the language of mathematics, computers and		
_	mation and reading aloud, and appropriate language for various purposes in oral and written communication. The course system		
·	or professional discourse (participles, relative clauses).		
04XNP1	German for Advanced Students P1	Z	2
	od grammar knowledge, extended general vocabulary, and good communication skills acquired at secondary school to be le		
	ien focused on working with technical and scientific texts and practising reading techniques (skimming, scanning, reading for tructures necessary for understanding a subtechnical text (passive voice, participles, participle structures) and it also focuses on	•	•
i.e., telephoning.	4	,,	,
04XNP2	German for Advanced Students P2	Z	2
· ·	estudents' skills in working with professional scientific texts (understanding, summarising, note-taking, interpreting) while exten-		
	oduces mathematical expressions and texts of nuclear power engineering. Increasing emphasis is placed on understanding and V, letter of application, interview, scholarship), and more complex grammatical structures (i.e., subjunctive, indirect speech).	a practising forma	communication,
04XNP3	German for Advanced Students P3	Z	2
	3 main parts (general communicative situations, grammar and technical topics). Students will develop their vocabulary in a vi	ariety of less com	mon situations
	r accidents, accident report, filling in a form, complaints). Based on presentations and technical and subtechnical texts, the viscout and subtechnical texts are a substantial and subtechnical texts.		
	ing, the environment, computer science, and car technology, will also be extended. Only authentic professional texts are use process information gained from their reading of complex and difficult texts and present it to the class in a simplified oral form. T	=	•
practice to and from Ge			
04XRM1	Russian for Intermediate Students M1	Z	2
_	for students with previous knowledge of Russian from secondary schools. Students are supposed to know the Russian alphal		-
	nmunication in everyday situations (introductions, socializing, greetings, shopping for food and objects of everyday need, ask nmar structures (verbal and nominal forms, irregular verbs, pronouns). The initial knowledge corresponds to the achievemen		-
	the course correspond approximately to the RZ3 course, but for half of the time allotted in the timetable.	riever of the IVEE	course. The
04XRM2	Russian for Intermediate Students M2	Z	2
	the RM1 course, its contents and scope correspond roughly to RZ4, however, for half of the time allotted in the timetable.		
04XRM3	Russian for Intermediate Students M3	Z	2
in the timetable.	e knowledge and skills acquired in RM1 and RM2 and its contents and scope are roughly at the same level as those of RZ5, h	nowever, for half of	the time allotted
04XRP1	Russian for Advanced Students P1	Z	2
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04XRP1 The entrance requirement structures, understanding	be the for the course is to achieve the B1 CEFR level. The objective of the course is revision of standard language structures, prong the fundamentals of technical language and training writing skills.	acticing more diffi	cult grammar
04XRP1 The entrance requirement structures, understandin 04XRP2	ent for the course is to achieve the B1 CEFR level. The objective of the course is revision of standard language structures, pring the fundamentals of technical language and training writing skills. Russian for Advanced Students P2	racticing more diffi	cult grammar
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04XRP1 The entrance requirement structures, understanding 04XRP2 The course is based on	ent for the course is to achieve the B1 CEFR level. The objective of the course is revision of standard language structures, pring the fundamentals of technical language and training writing skills. Russian for Advanced Students P2 RP1. It expands grammatical structures important for understanding technical texts (verbal adjectives, participles, passives,	racticing more diffi	cult grammar
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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. The 3-semester course develops standard vocabulary and pays attention to further grammar topics (e.g., perifrasis verbales, futuro imperfecto, direct object and indirect object pronouns, negative form of the imperative, and subjunctive), to written and oral communication on a given everyday or easy subtechnical topic, for which the students are trained by reading texts or listening to them Spanish for Intermediate Students M3 The course develops the students' knowledge from the previous course (SM1). Students are gradually acquainted with fundamentals of Spanish for 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 peculiarities of academic style. They will be competent enough to use the Internet in Spanish and search for information of their specialization or field of interest. Students will use the information to write short articles and summaries. The final part of the programme, general Spanish course based on course books, covers presentations and, finally, a written and oral examination. 04XSP1 Spanish for Advanced Students P1 Course concentrates on more difficult grammar topics, revision of vocabulary, basics of Spanish for specific purposes as well as written communication. Course prerequisites: level B2 of CEFR. 2 04XSP2 Spanish for Advanced Students P2 Ζ Course SP2 is the second part of the advanced Spanish course, extending Spanish for specific purposes topics. It comprises more grammar and syntax and focuses on independent written communication. 04XSP3 Spanish for Advanced Students P3 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 written communication based on what students will need in their career. 04XSZ1 Spanish for Beginners Z1 2 Course SZ1 is the first stage of the five-semester programme of Spanish studies; during the first stage the students will master phonetics and fundamental grammar structures and will be able to communicate at an elementary level on topics of everyday life. They will acquire and extend fundamental vocabulary of general Spanish and will develop it. Spanish for Beginners Students Z2 Course SZ2 is based 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 as to enable them to understand short adapted written texts and speech. Attention is also paid to cultural differences between Spanish-speaking countries and others such as the Czech Republic. Realia of Spanish-speaking countries are also included. 04XSZ3 | Spanish for Beginners Z3 The course is based on course SZ2, and develops the student's vocabulary and grammar structure. The course covers realia (history and culture) of the Spanish-speaking 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 and oral communication on a given general topic, for which the student is trained by reading texts or listening to them. 2 04XS74 Spanish for Beginners Z4 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 Spanish speaking countries, mainly of Spain. It pays attention to further grammar topics (perífrasis verbales, futuro imperfecto, direct object and indirect object pronouns, negative form of the imperative, and subjunctive), to written and oral communication 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 7 2 The course books are supplemented with additional subtechnical materials, so the students will be gradually acquainted with peculiarities of Spanish for specific purposes. In its final part, the general Spanish 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.	'	'
00PT	Preparatory Week	Z	2
00RET	Rhetoric	Z	1
The course is focus	sed 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	olic speech
as well as to its n	nonverbal aspects. Stylistics exercises, strategies for coping with stage-fright and a short excursion into the history of rhetoric are ar	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 sedu	uences and series - convergence range, criteria of uniform convergence, continuity, limit, differentiation and integration of functional	series, power serie	s. Series

1. Functional sequences and series - convergence range, criteria of uniform convergence, continuity, limit, differentiation and integration of functional series, power series, Series Expansion, Taylor's theorem. 2. Ordinary differential equations - equations of first order (method of integration factor, equation of Bernoulli, separation of variables, homogeneous equation and exact equation) and equations of higher order (fundamental system, reduction of order, variation of parameters, equations with constant coefficients and special right-hand side, Euler differential equation). 3. Metric spaces - metric, norm, scalar product, neighborhood, interior and exterior points, boundary point, isolated and non-isolated point, boundary of set, completeness of space, Hilbert spaces. Orthogonal polynomials. Complete orthogonal systems. 4. Fourier series - expansion of functions into Fourier series, trigonometric Fourier series and their convergence. 5. Differential calculus of functions of several variables - limit, continuity, partial and directional derivative, gradient, total derivatives and tangent 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

[1] Diferenciální po et funkcí více prom nných a funkcionálních vektor . [2] Funkce zadané implicitn . [3] Taylorovy ady funkce více prom nných. [4] Regulární zobrazení, zám na prom nných, nekartézské soustavy sou adnic. [5] Lokální, vázané a globální extrémy funkce více prom nných. [6] Základy teorie míry a obrys konstrukce Lebesgueovy míry. [7]

Integrální po et f	unkce více prom nných - Riemann v a Lebesgue v integrál, základní vlastnosti, Fubiniova v ta, v ta o substituci. Leviho a Lebesguderivace integrálu podle parametru. [8] Integrály po k ivkách a plochách. Integrální v ty.	eova v ta. Liitiita, s	spojitost a
01DYKO	Introduction to Continuum Dynamics	Z,ZK	3
	es a rigorous introduction to the mathematical description of continuum dynamics. In the first part, the necessary mathematical tools		l
=	alculus, differential forms, and integration on manifolds. Next, the fundamental concepts such as several deformation tensors and the s		_
are defined. They	are used subsequently in the derivation of the conservation laws of mass, momentum and energy in both integral and differential form	ns. The conservation	on laws are
	further adapted to the specific cases of viscous and inviscid fluid and linear/nonlinear elastic body.		T
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 lithear	inear mappings. 7.	Frobenius
01LAL2	theorem. Linear Algebra 2	Z,ZK	4
	se matrix and operator. 2. Permutation and determinant. 3. Spectral theory (eigenvalue, eigenvector, diagonalization). 4. Hermitian an		l
	jonality. 6. Metric geometry. 7. Riesz theorem and adjoint operator. Outline of the exercises: 1. Methods for calculation of inverse matri	-	
of determinants.	3. Calculation of eigenvalues and eigenvectors. 4. Hermitian and quadratic forms. Canonical form. 5. Scalar product and orthogonalit	y. Calculation of or	thogonal
	complements. 6. Geometry – exercises and examples. 7. Adjoint operators.		
01LALZ	Linear Algebra 1, exam	ZK	2
01MAN	Calculus 1	Z	4
	Basic calculus (real analysis, functions of one real variable, differential calculus).		
01MAN2	Calculus 2	Z,ZK	8
1. Continuation of	differential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergence, operations on series, absolute ar	nd conditional conv	ergence 3.
Real and complex p	power series, the Cauchy-Hadamard theorem, expansion of function into power series, summation of infinite series. 4. Theory of integr	als: primitives, defi	inite integral
	(Riemann definition), techniques of integration and application of integrals, Generalized Riemann integral		
01MANZ	Calculus 1, exam	ZK	4
01PGR1	Computer Graphics 1	Z,ZK	2
•	two-semester "Computer Graphics" course is devoted to the specifics of digital display devices spanning from history up to the state of	•	
	ental problems in 2D computer graphics is given together with their solutions. Focus is put on mathematical description of problems and extractions in a variety of subjects available at FNSPE. The final part of the course covers the applications of com		
algorithms using r	the process of authoring scientific documents and presentations.	puter grapriles app	noaches in
01PGR2	Computer Graphics 2	Z,ZK	2
	of the two-semester "Computer Graphics" course begins with a brief introduction to signal theory in the context of aliasing - a phenom		l
-	a well structured survey of fundamental problems in 3D computer graphics is given together with their solutions, from the description	•	-
endering. Focus is	put on mathematical description of problems and explanation of the corresponding algorithms using knowledge previously obtained in	a variety of subject	cts available
at FNSPE. The algo	orithm implementation aspect such as data structures design etc. is also a matter of concern. In the last lecture, a number of theoretic	cal concepts are de	emonstrated
	using Blender, an open-source 3D modeling and rendering software instrument.		
01PSL	LaTeX - Publication Instrument	Z	2
0451445	The course is devoted to the basics and facilities of computer typography, particularly to the system LaTeX	7.71	· -
01RMAF	Equations of Mathematical Physics	Z,ZK	7
	Equations of Mathematical Physics course is solving integral equations, theory of generalized functions, classification of partial differential equations, theory of integral tr		7 d solution of
The subject of this	Equations of Mathematical Physics course is solving integral equations, theory of generalized functions, classification of partial differential equations, theory of integral trespands partial differential equations (boundary value problem for eliptic PDE, mixed boundary problem for eliptic PDE).	ansformations, and	1
The subject of this 01SITE1	Equations of Mathematical Physics 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). Computer Networks 1	ansformations, and	2
The subject of this 01SITE1 Understanding the	Equations of Mathematical Physics course is solving integral equations, theory of generalized functions, classification of partial differential equations, theory of integral trespands partial differential equations (boundary value problem for eliptic PDE, mixed boundary problem for eliptic PDE).	ansformations, and Z tocols, practical ex	2 rercises with
O1SITE1 Understanding the TCP/IP communications	Equations of Mathematical Physics 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). Computer Networks 1 history and present network (LAN, WAN, use the principles and technologies). Architecture of reference model ISO/OSI. Network pro	ansformations, and Z tocols, practical ex orities, public key in	2 ercises with
O1SITE1 Understanding the TCP/IP communications	Equations of Mathematical Physics 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). Computer Networks 1 history and present network (LAN, WAN, use the principles and technologies). Architecture of reference model ISO/OSI. Network pro tions. Internet services - mail, remote access, www. Secure communication, tunneling. Directory services, certificates, certification author	ansformations, and Z tocols, practical ex orities, public key in	2 ercises with
O1SITE1 Understanding the ICP/IP communica (PKI). Use in pre	Equations of Mathematical Physics 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). Computer Networks 1 history and present network (LAN, WAN, use the principles and technologies). Architecture of reference model ISO/OSI. Network pro tions. Internet services - mail, remote access, www. Secure communication, tunneling. Directory services, certificates, certification authoractice. Network security - firewalls (packet filters, proxies, gateways, NAT, DMZ), practical exercises. (According to the interest - the se	Z tocols, practical ex orities, public key ir erial control lines, r	2 ercises with nfrastructure modems)
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02ELMA **Electricity and Magnetism** Z,ZK 6 Electric charge, Coulomb's law, electrostatic field, Gauss' law. Electric dipole, polarization. Conductors anddielectrics. Electric current and circuits, conductivity. Basics of the relativity theory. Electrodynamic forces, magnetic field. Magnetic dipole, magnetics. Electromagnetic induction, ac currents. Electromagnetic waves, Maxwell equations Quantum Mechanics 1 6 Abstract: The lecture describes the birth of quantum mechanics and description of one particle and more particles by elements of the Hilbert space as well as its time evolution. Besides that it includes description of observable quantities by operators in the Hilbert space and calculation of their spectra. 02KM2 Z.ZK Quantum Mechanics 2 Abstract: The lecture expands the introduction to quantum mechanics with more general formalism of quantum theory, approximate methods and path integral. It summarizes the terminology and methods used in various applications of quantum mechanics and prepares the students for an effective scientific research and further study, in particular, of the modern formulations of quantum field theory. 02MECH ntroduction to physics, physical quantities and units. Particle kinematics, basic types of motion and theirsuperposition. Particle dynamics, one-dimensional equations of motion, motion in central force field, forces innoninertial reference frames. Mechanics of system of free particles, two-body problem, collisions. Mechanics ofrigid body, rotation. Fundamentals of continuum mechanics, elasticity, hydrodynamics. Sound. 02MECHZ Mechanics - Examination ZK 2 The content of the subject is the examination according to the plan of studies. 02PRA1 ΚZ Experimental Laboratory 1 6 Lecture is intended especially for students who intend to study some of the physical specializations of FNSPE(branch Physical Engineering, Nuclear Engineering). But it can be also attended by students interested in the otherspecializations. In Experimental laboratory students learn how to prepare for experiments (including work with theliterature), the implementation of the measurement (acquire of different experimental procedures and routines), willteach writing the records of measurement, processing and evaluation of results. At the same time practically extendthe knowledge gained in lectures on physics. 02PRA2 **Experimental Laboratory 2** ΚZ 6 Lecture is intended especially for students who intend to study some of the physical specializations of FNSPE(branch Physical Engineering, Nuclear Engineering). But it can be also attended by students interested in the otherspecializations. In Experimental laboratory students learn how to prepare for experiments (including work with theliterature), the implementation of the measurement (acquire of different experimental procedures and routines), willteach writing the records of measurement, processing and evaluation of results. At the same time practically extendthe knowledge gained in lectures on physics. 02SMF Seminar of Mathematical Physics The purpose of the seminar is to illuminate mathematical physics by virtue of solved examples. It is supposed that the teachers of the physics department will present simple tasks 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 The course is an introduction to analytical mechanics. The students acquire knowledge of the basic concepts of the Lagrange and Hamiltonian formalism as well as diferent approaches to description of dynamics (Newton's, Lagrange, Hamilton and Hamilton-Jacobi equations). The efficiency of these methods is illustrated on elementary examples like the two-body problem, the motion of a system of constrained mass points, and of a rigid body. Advanced parts of the course cover differential and integral principles of mechanics. The subject is the first part of the course of classical theoretical physics (02TEF1, 02TEF2). 02TFF2 7.7K Theoretical Physics 2 Tensors and transformations in physics. Mechanics of point mass, rigid body and continuum. The special theory of relativity: relativistic mechanics and classical field theory in the Minkowski space-time. Classical electrodynamics: Maxwell's equations in the Minkowski space-time, electromagnetic waves in dielectric media, electromagnetic radiation in the dipole approximation. 02TER Heat and Molecular Physics 7.7K 4 Thermal expansion of materials, heat transfer; stationary and non-stationary heat conduction, heat transfer and penetration; 1st and 2nd thermodynamic principle, ideal and real gas, entropy; non-chemical systems: dielectric and magnetic materials; Maxwell relations and thermodynamic potentials; kinetic theory: Maxwell's velocity distribution, equipartition theorem. Thermodynamics and Statistical Physics Foundation of thermodynamics and statistical physics. Thermodynamic potential, the Joule Thomson effect, conditions of equilibrium, the Braun-Le Chatelier principle. Statistical entropy. Basics of many body descriptionfrom a statistical point of view (classical and quasiclassical regime within the frame of a canonical and grand-canonical ensemble, Fermi gas, models of crystals and the black body radiation). The Boltzmann equation is used to discusses simple transport phenomena. 02VOAF Waves, Optics and Atomic Physics Wave phenomena in mechanics and electromagnetism: modes, standing and travelling waves, wave packets indispersive media. Wave optics: polarization, interference, diffraction, coherence. Geometrical optics. Introduction toquantum physics: black body radiation, quantum of energy, photoeffect, the Compton effect, the de Broglie waves, the Schrodinger equation, stationary states and spectra of finite systems. 02ZJFB ΚZ Nuclear Physics B 3 This scientific field presents formidable challenges both experimentally and theoretically, simply because we are dealing with the submicroscopic domain, where much of our classical intuition regarding the behaviour of objects fails us. The lecture is a basic introduction to very interesting regions of subatomic physics. Foundations of Physical Measurements 1 The lecture is designed for students of physical specializations (Experimental particle physics, Physical engineering, Nuclear engineering), however, it can be attended by students of other branches. The goal of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired data on a PC. Students learn the basic habits of work in a physics lab. Foundations of Physical Measurements 2 The lecture is designed for students of physical specializations (Experimental particle physics, Physical engineering, Nuclear engineering), however, it can be attended by students of other branches. The goal of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired data on a PC. Students learn the basic habits of work in a physics lab. **English Conversation** The course will develop the student's communication skills acquired throughout their previous studies. It aims to improve all aspects of oral communication. The student will develop their vocabulary for various communication situations and will master their communication strategy. They will also practise their listening skills in order to better follow and participate in discussions. The student will be trained to express their ideas clearly and according to current English usage, and become a more confident speaker. 04XAM1 English for Intermediate Students M1 The course is designed for students who have successfully completed the full secondary school English language course at least at the A2 level of the Common European Framework of Reference for Languages (CEFR). It provides an introduction into English for Specific and Academic Purposes (ESP, EAP), i.e., into fundamentals of vocabulary and style typical of professional oral and written communication situations. Thus it covers topics related to the student's life and needs as well as topics of subtechnical interest. Attention is also paid to extending the knowledge of grammar issues used in EAP.

04XAM2	English for Intermediate Students M2	Z	2
	spects the student to have completed the AM1 course. It develops their skills for work with subtechnical texts, focusing also more on		
and lexical items typic	cal of ESP and EAP (e.g., definition, existence and classification of phenomena, object descriptions). Part of the course is also guided revision is included.	writing. If necessa	ary, grammar
04XAM3	English for Intermediate Students M3	Z	2
l l	the skills that enable students to cope with features typical of professional style. Increasing attention is paid to developing subtechnic	al vocabulary and	independent
- ·	rofessional texts. Great emphasis is placed on distinguishing different levels of formal and informal oral and written communication		
equivalents. The cour	rse also includes studying abstracts and rules for writing them as well as basic rules for preparing and giving a short presentation o	n a chosen topic r	elated to the
04XAMZK	student's field. English for Intermediate Students Examination	ZK	4
	t is the examination as given by the study plan. The examination covers the AM1, AM2, and AM3 courses and consists of two parts		1
	min). The student is expected to master the AM syllabus and demonstrate the ability to apply their knowledge gained in the three E	· ·	i) and orai
04XAP1	English for Advanced Students P1	Z	2
The course is design	ned for students who have successfully completed the full secondary school English language course (at least the B1 level of the C	ommon European	Framework
	anguages - CEFR). It provides an introduction into English for Specific and Academic Purposes (ESP, EAP), i.e., into the fundament	•	
-	typical of professional oral and written communication situations (fundamentals of terms in mathematics and physics, definitions, grant and written communication situations (fundamentals of terms in mathematics and physics, definitions, grant and written as a training of the situation of the si		-
covers professional of	ral and written communication on topics related to the undergraduate's life and needs. It develops skills for free professional writing (w polite request). If necessary, revision of selected grammar topics is included.	riting a CV, letter of	application,
04XAP2	English for Advanced Students P2	7	2
	ased on AP1, thus extending the student's skills for working with subtechnical texts, and even with professional texts of chosen brai	_	_
	it concentrates on chosen grammar topics, but mainly intends to develop understanding of syntactic structures and typical rhetorica		_
of descriptions, and,	if possible, a case study). Increasing emphasis is placed on the undergraduate's independent work with and reading of linguistical	ly more demandin	g materials.
The course extends t	the student's subtechnical vocabulary, and includes fundamental notions of chosen branches of science. It is focused on formal writing	ng including the s	entence and
	paragraph structure, linking, cohesion and coherence in texts.		
04XAP3	English for Advanced Students P3	Z	2
	ased on AP2 and expects the student to work without any guidance with authentic professional materials and to interpret the text. It in	•	
	s and functions (e.g., expressing an opinion, agreement, and objections; taking part in discussion, note-taking; summarizing, writing oject on a given or chosen topic and presenting it. The course places emphasis on distinguishing levels of formal and informal lang		
also preparing a pro	communication.	dage botti ili olar a	and winten
04XAPZK	English for Advanced Students Examination	ZK	4
	s the examination as given by the study plan. The student is supposed to demonstrate mastering the AP3 syllabus and the ability to a	pply their knowled	ı Ige obtained
in the three AP co	ourses. The examination consists of 2 parts - written (110 min) and oral (30 min) and includes also oral presentation of a topic from	the student's field	of study.
04XCESM1	Czech for Foreigners - Intermediate 1	Z	2
The course is focused	d on correct pronunciation, important morphological phenomena, prepositional phrases, and verb forms as well as on extending the si	udent's vocabular	y for various
	social situations.		
04XCESM2	Czech for Foreigners - Intermediate 2	Z	2
The course develops	s the topics covered in CESM1 and is then focused on more difficult grammar phenomena. It practices writing, speaking, and readir in understanding common abbreviations, abbreviated words, and mathematical terms and formulas.	ig skilis and trains	the student
04XCESM3	Czech for Foreigners - Intermediate 3	7	2
	vises morphological topics covered earlier and extends the student's knowledge of more difficult language phenomena. It is especia	_	_
	lexicology and on developing the student's writing skills.		
04XCESMZK	Czech for Intermediate Students Examination	ZK	4
The course content	is the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of the CES	M1,2,3 courses a	nd can only
	be taken after successful completion of the 3 courses. Detailed information is to be obtained from the teacher.		
04XCESP1	Czech for Foreign Students - Advanced 1	_ Z	2
	ne course is very good knowledge of the Czech language, i.e., communicative competences at least at level B2 of the Common Europ		
	on revision of standard language structures, but mainly on practising more complex grammatical structures typical of the style of sci Il style of engineering and professional communication, both in spoken and written form. The topics include University Studies and S		_
basios of functional	includes communication with teachers and faculty administrators.	radorii Eilo. VVIIII	n practice
04XCESP2	Czech for Foreigners - Advanced 2	Z	2
	the student's knowledge acquired in CESP1 and focuses on difficult language phenomena. It practises working with technical and	specialist texts pla	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,	and, finally, preser	ntation of the
	student's project. Writing skills necessary for professional communication are trained.		
04XCESPZK	Czech for Foreign Students - Advanced Examination	ZK	4
The course content	is the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of the CES be taken after successful completion of the 3 courses. Detailed information is to be obtained from the teacher.	P1,2,3 courses ar	nd can only
04XCESZ1	Czech for Foreigners - Beginners 1	Z	2
I I	ed for students on the English programme. Students will become acquainted with the main characteristics of Czech (phonetic and g		1
=	nguage and speaking skills. The course focuses on pronounciation exercises, simple social phrases, and oral and written communic	•	-
communicative situat	tions. The course covers roughly lessons 1-5 in "Chcete mluvit esky" by H. Remediosová and E. echová. At the end of the course, A1 (CEFR) approximately.	the students will h	ave reached
04XCESZ2	Czech for Foreigners - Beginners 2	Z	2
	ommunication competences acquired in CESZ1 are further developed. Students extend their knowledge of Czech declension and co	njugation system	and practise
communication of fr	requent topics. The course covers roughly lessons 6-10 in "Chcete mluvit esky" by H. Remediosová and E. echová. At the end of	the course, the st	udents will
	have reached A2 (CEFR) approximately.		T
04XCESZ3	Czech for Foreigners - Beginners 3	Z	2
	develops the language and communication competences acquired in the XCESZ1 and XCESZ2 courses. The teaching focuses on the depending grammar practice, and introducing Czech culture. Students are asked to produce simple texts and		-
contect pronunciatio	n, deepening grammar, including grammar practice, and introducing Czech culture. Students are asked to produce simple texts and		
	y also practise understanding texts in terms of main ideas or looking for specific details in texts. The course covers roughly lessons	5-7 in . eština ev	pres 1"

The second state of the control of t	4
The course content is the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of the 04XCESZ1,2,3 courses and	can
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 Z	2
French - intermediate FM The objective of this three-semester course is to improve and further develop communication in the French language in both written and oral form. Stur	
will be able to communicate in social interaction and in academic, scientific and professional environment. They will be able to use the language to transmit general and techni	ical
information and to solve problems. FM1 The course builds on and further develops linguistic competence acquired at secondary school. It revises, systemizes and expands lang	guage
skills gained in previous study. The following topics are covered: University studies in our country and in France, writing of transactional letters, CV, personal statement, request, ar	nswer
to an advert, French culture and geography, Paris. Topics of specialization: mathematics, physics. Reading technical and popular science texts, work 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 texts, features typical for tect	hnical
and scientific language (passives, nominalization, word formation). Topics: physics, power engineering, environment, Internet, success of French science and technology, French	nch
scientists, artists and architects. Description of an object, device, shapes, dimensions, material.	
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 (subordinate and infinitive cla	auses,
participle structures, compound tenses). Text summaryStudents prepare a written paper which will be delivered in form of an oral presentation in-class. The paper is linked to	the
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 work compiled from French ar	rticles
and one's own knowledge/experienceLonger monologues on topics /situations set for the examination are prepared. Text structure, cohesion and coherence.	
04XFMZK French for Intermediate Students Examination ZK	4
The content is the examination as given by the study programme. The whole French programme is ended with an examination covering the contents of FM1-FM3. The examination	ation
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
FP advanced course The objective of this three-semester course is to improve and further develop communication in the French language in both written and oral form. Student	ts 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 general and technical information	n and
to solve problems. FP1 The course builds on and further develops linguistic competence acquired at secondary school. Difficult grammar topics are repeated and expanded: subje	onctif,
passé composé-imparfait, pronouns. The following specific topics are covered: University studies in our country and in France, writing of transactional letters, CV, personal stater	ment,
request, answer to an advert, environmental issues, success of French science and technology, chosen topics from French regional culture, Paris. Topics of specialization: mathem	natics,
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 on given topics. Features typic	ical 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 engineering environment. Sp	pecial
skill - translation of shorter texts (both from and into the language). Writing of a paper and making oral presentation in-class. The paper generally covers a technical /applied sci	ience
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 and is organized according	ng to
Examination Instructions, a document available on the web. Assessment of the presentation is included into the examination grading.	
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 socializing and in professional	al life.
The course includes French for specific / technical communication and reading of popular science and scientific texts. FZ1 The objective is to be able to communicate at element	ntary
level, actively using the knowledge of chosen elementary language. The contents is roughly outlined by lessons 1 - 7 of the textbook Pravda - Pravdová, French for beginner	rs
(Francouzština pro za áte ky). It is extended with situations of communication and functions from the textbook Espaces I, lessons 1-4: introductions, personal information, asking	
giving the directions, simple instructions and questions. Special attention is paid to pronunciation. Spelling is explained in connection with pronunciation and grammar.	ng and
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04XFZ2 French for Beginners Z2 Z The course is linking up with FZ1. Elementary linguistic knowledge and communication skills are expanded. The scope is given by lessons 8 - 13 of the textbook: Pravda - Pravda	2
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04XNM2 German for Intermediate Students M2 The course introduces other more complex grammatical structures and their application in communication based on technical texts, such as the relation between technology 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 etc. Students practise reading for information and reading aloud, and appropriate language for various purposes in oral and written communication. The course systematically revises other grammatical phenomena important for professional discourse (participles, relative clauses). 04XNM3 German for Intermediate Students M3 The course introduces other more complex grammatical structures and their application in communication based on technical texts, such as the relation between technology 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 etc. Students practise reading for information and reading aloud, and appropriate language for various purposes in oral and written communication. The course systematically revises other grammatical phenomena important for professional discourse (participles, relative clauses). 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 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. 04XNP1 German for Advanced Students P1 This course requires good grammar knowledge, extended general vocabulary, and good communication skills acquired at secondary school 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, reading for detail). It revises and develops more difficult grammar structures necessary for understanding a subtechnical text (passive voice, participles, participle structures) and it also focuses on practical everyday communication, i.e., telephoning. 04XNP2 German for Advanced Students P2 Ζ 2 The course develops the students' skills in working with professional scientific texts (understanding, summarising, note-taking, interpreting) while extending their general and subtechnical vocabulary range. It introduces mathematical expressions and texts of nuclear power engineering. Increasing emphasis is placed on understanding and practising formal communication, both written and oral (CV, letter of application, interview, scholarship), and more complex grammatical structures (i.e., subjunctive, indirect speech). 04XNP3 German for Advanced Students P3 The course consists of 3 main parts (general communicative situations, grammar and technical topics). Students will develop their vocabulary in a variety of less common situations (traffic problems and car accidents, accident report, filling in a form, complaints). Based on presentations and technical and subtechnical texts, the vocabulary range in fields such as nuclear power engineering, the environment, computer science, and car technology, will also be extended. Only authentic professional texts are used. By means of a presentation, students are trained to process information gained from their reading of complex and difficult texts and present it to the class in a simplified oral form. The course also includes translation practice to and from German. 04XNPZK German for Advanced Students Examination 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. Russian for Intermediate Students M1 04XRM1 The course is designed for students with previous knowledge of Russian from secondary schools. Students are supposed to know the Russian alphabet (both printed and handwritten), basic vocabulary for communication in everyday situations (introductions, socializing, greetings, shopping for food and objects of everyday need, asking the way and giving directions), they can use basic grammar structures (verbal and nominal forms, irregular verbs, pronouns). The initial knowledge corresponds to the achievement level of the RZ2 course. The contents and scope of the course correspond approximately to the RZ3 course, but for half of the time allotted in the timetable. 04XRM2 Russian for Intermediate Students M2 Ζ 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 timetable. 04XRM3 Russian for Intermediate Students M3 Ζ 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 those of RZ5, however, for half of the time allotted in the timetable. 04XRMZK Russian for Intermediate Students Examination ZK 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. 2 04XRP1 Russian for Advanced Students P1 The entrance requirement for the course is to achieve the B1 CEFR level. The objective of the course is revision of standard language structures, practicing more difficult grammar structures, understanding the fundamentals of technical language and training writing skills. 04XRP2 Russian for Advanced Students P2 Ζ 2 The course is based on RP1. It expands grammatical structures important for understanding technical texts (verbal adjectives, participles, passives, verb aspects, specific syntactic structures). Stress is put on independent oral and written communication. Russian for Advanced Students P3 The course is based on RP2 and is mainly focused on working with technical and scientific texts (reading comprehension, oral and written paraphrasing, translation). The RP1 - RP3 courses require good previous knowledge of general language at secondary level (listening, reading, correct communication in everyday situations). The courses develop and expand these skills. Further study is aimed at professional and technical skills (reading technical literature according to the students' specialization, oral and written interpretation). Students develop their subtechnical vocabulary and practice quick and correct communication in professional situations. They will be able to both speak write accurately and with confidence on technical topics. 04XRPZK Russian for Advanced Students Examination 7K 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. 04XRZ1 Russian for Beginners Z1 The course represents the first stage of the five-semester programme, its final aim being reading and understanding professional texts written 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 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 7 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 stress. 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.

04XRZ3			
	Russian for Beginners Z3	Z	2
	d on RZ2 and includes further everyday topics, develops understanding of short compact texts on new subtechnical topics (for training		•
and listerling) at	d introduces new grammar. Students will be trained to distinguish intonation patterns while listening to spoken language. They will be understood, and to express their opinion. Writing skills will be trained on guided writing tasks and note-taking.	able to respond	so as to be
04XRZ4	Russian for Beginners Z4	Z	2
	d on RZ3. It improves and expands the knowledge of general language in all four skills (reading and understanding longer texts with a c	-	1
	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		-
communication	on more specific topics (environment, addictions, the green movement). They become acquainted with various geographical data (e.g.	, Siberia), learn l	now 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
-	s the student to have completed RZ4. It concentrates predominantly on reading skills (working with professional texts, i.e. understanding		-
	specialized text) and speaking, and to a certain extent, writing about the professional information obtained by reading the texts. Comm		
	Studying grammar is based on professional and technical texts and only includes items typically used in professional communication (-
•	ve voice). Students develop their technical and economic vocabulary, and are also trained in some professional skills (writing a CV, po		3
04XRZZK	Russian for Beginners Examination It is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowled	ZK	1
	ents are eligible for the oral examination only after a prior pass in RZ5 and a successful written examination. Students are given instr	-	
04XSM1	Spanish for Intermediate Students M1	7	2
	signed for students whose competence is at level B1 of CEFR, i.e. those who studied Spanish in the secondary school. The 3-semest	er course develo	
	ays attention to further grammar topics (e.g., perifrasis verbales, futuro imperfecto, direct object and indirect object pronouns, negativ		
), to written and oral communication on a given everyday or easy subtechnical topic, for which the students are trained by reading tex	-	
04XSM2	Spanish for Intermediate Students M3	Z	2
The course devel	ops the students' knowledge from the previous course (SM1). Students are gradually acquainted with fundamentals of Spanish for sp	ecific purposes ir	order to be
	able to work with specialized texts on the Internet.		
04XSM3	Spanish for Intermediate Students M3	Z	2
	are supplemented with additional subtechnical materials, so the students will be gradually acquainted with the peculiarities of academic		
enough to use the	Internet in Spanish and search for information of their specialization or field of interest. Students will use the information to write short		mmaries. The
	final part of the programme, general Spanish course based on course books, covers presentations and, finally, a written and oral ex		
04XSMZK	Spanish for Intermediate Students Examination	ZK	4
The course conten	t is the examination as given by the study plan. SMZK examination consists of two parts - written and oral; to be eligible for the written parts are ded assessment for source SM2 Oral examination follows the written part	rt, students will r	nave obtained
0.41/0.004	non-graded assessment for course SM3.Oral examination follows the written part.		
04XSP1	Spanish for Advanced Students P1	Z Course presenti	2
Course concentrat	es on more difficult grammar topics, revision of vocabulary, basics of Spanish for specific purposes as well as written communication. of CEFR.	Jourse prerequis	sites: level bz
04XSP2	Spanish for Advanced Students P2	7	2
	second part of the advanced Spanish course, extending Spanish for specific purposes topics. It comprises more grammar and syntax	_	_
	written communication.		
04XSP3	Spanish for Advanced Students P3	Z	2
	final part of the advanced Spanish course. It is based on texts chosen by the students according to their future specialization. It is focu	sed on written co	mmunication
	based on what students will need in their career.		
04XSPZK	Spanish for Advanced Students Examination	ZK	4
The course conten	t is the examination as given by the study plan. Examination SPZK consists of two parts, namely oral and written. The prerequisite for a	dmission to oral	part 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	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	_	
	communicate at an elementary level on topics of everyday life. They will acquire and extend fundamental vocabulary of general Spani		i
04XSZ2	Spanish for Beginners Students Z2	Z	2
	ed on course SZ1, and expects students to develop and extend the knowledge and skills acquired so far. Grammar structures and lexis		
mem to understan	d short adapted written texts and speech. Attention is also paid to cultural differences between Spanish-speaking countries and others Realia of Spanish-speaking countries are also included.	, such as the CZ	ecii Kepublic
04XSZ3	Spanish for Beginners Z3	Z	2
	partistrible beginners 23 and develops the student's vocabulary and grammar structure. The course covers realia (history and culture) of the	-	1
	It pays attention to further grammar topics (pretérito perfecto, pretérito indefinido, pretérito imperfecto, the gerund and the imperative)		-
	communication on a given general topic, for which the student is trained by reading texts or listening to them.		
04XSZ4	Spanish for Beginners Z4	Z	2
	ed on course SZ3. It develops the student's vocabulary and extends the knowledge of the culture and social customs of the Spanish	-	I
Spain. It pays atte	ntion to further grammar topics (perifrasis verbales, futuro imperfecto, direct object and indirect object pronouns, negative form of the	imperative, and	subjunctive),
	to written and oral communication on a given general or subtechnical topic, for which the student is trained by reading texts or listening	ig to them.	
04XSZ5	Spanish for Beginners Z5	Z	2
The course books	are supplemented with additional subtechnical materials, so the students will be gradually acquainted with peculiarities of Spanish fo part, the general Spanish course based on the course book will end with presentations and, finally, a written and oral examina		es. In its final
04XSZZK	Spanish for Beginners Examination	ZK	3
	ent is the examination as given by the study plan. Examination consists of two parts - written and oral. Student can register for oral ex		
	passed the written examination test.		
11BSEM	Bachelor Seminar	Z	1
In the first part of the	ne seminar, students familiarize themselves with the general principles of publishing and presenting scientific work and the formal requ		_
projects at the fac	ulty. The second part is designed as a practical training for the defence of the bachelor's degree project. The students give oral preser		
projects at the fac	ulty. The second part is designed as a practical training for the defence of the bachelor's degree project. The students give oral preser 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.		

11SFIPL	Seminar on Solid State Physics	KZ	2	
1.Introduction of the	ne Seminar and ?SSS? software features. 2.Module "bravais" - crystal structure and X-ray diffraction in 2D? theory 3.Simulations of	diffractive phenome	ena related	
to following theme	to following themes: crystal lattice versus crystal structure, primitive cell, elementary cell, lattice plane, reciprocal grid, Laue and Bragg condition, atomic scattering factor, structural			
	actical structural analysis 4. Module "laue" - Diffraction on perfect and imperfect crystals 5. Simulations: influence of structural disorder on	=		
	cillations, quasi crystals 6."born" module - dynamics of crystalline grid in 1D ? theory 7.Simulations: planar waves, traveling and stand	-		
	y and momentum transport, infinite chain, chain of finite lenght, boundary conditions, wave packets, group and phase velocity, dispersion			
	nharmonicity 8."debye" module - lattice dynamics and thermal capacity ? theory 9.Simulations: Brillouine zone, dispersion relation, del	•		
	drude" module - dynamics of classical electron gas in 2D ? theory 11. Simulations: diffuse electron movement, electron drift in an exte		-	
Snockiey experime	nt, electron mobility, electron motion in magnetic field, cyclotron frequency, Hall experiment, magnetorezistence 12.Assignment, elabo seminar work.	oration and present	tation of the	
447EDI		V7	2	
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	•		
Chergy bands ex	interpret a broad phenomenological basis of physical properties of crystalline solids	rysternationity intro-	aucc ana	
12AUX	Administration of UNIX System	KZ	2	
IZAOA	Basic and more advanced administration of Unix operating system	1 1 1	2	
12BPFI1		Z	5	
	Bachelor Project 1 ct is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the proj	-	_	
The bachelol projec	regular meetings and discussions.	ect supervisor dun	ing common	
12BPFI2		Z	10	
	Bachelor Project 2 ct is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the proj	l	10	
The bachelol projec	regular meetings and discussions.	ect supervisor dun	ing common	
12MOF		ZK	2	
12MOF	Molecular Physics	l I	2	
	deas on multi-atomic molecules and molecular matter, and on structure-to-physical properties relations. Methods of molecular structu		4	
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 used as a principle programming language as a demonstration tool. The seminars are held in computer laboratory.	ional environment	IVIAI LAD IS	
12NT		ZK	2	
	Nanotechnology			
	duce students mainly to modern technological methods of preparation of semiconductor, metal and dielectric nanostructures. Physica gies (MBE, MOVPE, EBL, sol-gel and colloidal solution) will be explained. Substantive attention will be devoted to epitaxial technolog			
	paration. Particular emphasis will be focused on detail characterization of "in situ" and "ex situ" techniques, their applications for heter	="		
	cussed as well. Some supportive technical methods - lithography, diffusion, evaporation, ion implantation, contact and dielectric layer			
g	as well as soldering and encasement.	p p		
12PAS	Computer Algebra Systems	Z	2	
Practically oriented	d introduction to computer algebra systems (CAS): their main characteristics, ways and means of using them. Constituent part is real	ized in computer c		
	students acquire basic skills with CAS by solving relatively simple and basic tasks from mathematics and physics.	·		
12POAL	Computer Algebra	KZ	2	
Lisp, representation	n of basic objects (integers, rational and algebraic numbers, polynomials, rational functions, radicals, algebraic functions), arithmetics, s	implification, greate	est common	
divisor, resultant,	derivation, series summation, integration, ordinary differential equations, factorization, equations solving, quantifier elimination, subst	itution and pattern	matching,	
algebraic programn	ning, graphics, Maple - detailed introduction and solving of practical examples, applications, overview of other systems (Axiom, Macsyr	na, Mathematica),	miniproject.	
12PYTH	Scientific Programming in Python	Z	2	
The aim of this cou	rse is to learn the fundamentals of the modern Python programming language with a focus on scientific computing. Emphasis is place	ed on effective solu	tions to real	
problems. The co	ourse is performed in an interactive form of practical exercises, whose topics can be tailored to the content of other subjects or students.	nt theses. Students	are also	
involved in ongoir	ng research. In the introductory part of the course, students learn the basic features of Python?from basic types to object oriented or	functional program	ming. The	
greater part of th	e course focuses on specific features of Python for scientific programming. Presented are the main numerical libraries NumPy, SciPy	and the Matplotlib	graphics	
	library. We show how to generate efficient code, how to combine Python with other languages, what tools are available.			
12UFN	Introduction to Photonics and Nanostructures	KZ	3	
Overview of nanost	tructures and nanotechnologies; quantum technologies; quantum nanostructures; photonic structures; nanophotonics and nanoplasm	onics; optical wave	eguides and	
	fibers; integrated photonics; computer simulations; technological realization; student presentations			
12ULTB	Introduction to Laser Technique	KZ	3	
Overview of electr	omagnetic radiation sources; laser principle; classification of lasers; characterization and rough application of various types of lasers;	laser safety preca	utions. The	
	laser amplifier, Q-switching, mode-locking.			
12UNXAP	Introduction to UNIX	Z	2	
	perating systems. Personal computer, workstation and supercomputers. Processor, memory, bus, devices, hard disk, network interfact			
	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	· · · · · · · · · · · · · · · · · · ·		
A-willdows. Coll	nputer networks. Local computer networks. Global computer networks. Addresses and protocols TCP/IP. Network configutation of a configuration of a	Jiliputer. Network s	SEI VICES.	
1011051		7.71/	2	
12UPF1	Introduction to Computational Physics 1 on and its role in physics, methodology of writing computer codes. Computer languages for physics. Numerical libraries and program	Z,ZK	2 Computer	
	isualization. Computational fluid dynamics, hydrodynamic simulations, methods for discretization of Euler equations. High-performance		-	
software for parallel simulations. Databases of scientific information, scientist evaluation, citation analysis.				
12UPF2	Introduction to Computational Physics 2	Z,ZK	2	
	complex systems, chaotic systems, fractals and their applications in physics. Artificial intelligence methods: neural networks, machine			
. 401111116ai 1110ucis,	expert systems and their applications in physics. Artificial intelligence metrious, neural networks, machine	, loanning, genetic	aigonuillia,	
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			
asiloany onlone	and technical computing, data analysis, data visualisation and algorithm development.		. 55.5111110	
	,			

12VPMF	Selected Topics in Modern Physics	Z	3
	rse is to improve students' knowledge in modern parts of physics (such as measuring of gravitational waves, neutrinos, discovery of l		
	with a partial help of computer algebra systems (e.g. Maple). Apart from the other courses related to modern physics taught in this st		
not deal with detaile	ed mathematical formalism of studied phenomena. Therefore, the secondary aim is the increase of students' motivation for deeper und	derstanding of mo	dern physics
12VTV	and its laws in their following study	Z	2
ı	Scientific and Technical Computing familiar with methods of solving of computational problems in the scientific and technical practice, and with methods of their program	_	1 1
The students get	mainly to programming in the Fortran language.	ming. The course	is offerfied
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		1
	tain, on the bachelor level, broad and general information on optics, giving an essential orientation in the field, especially with respec	=	-
work. Particular topi	ics are further elaborated during departmental masters program. The lecture stems from the electrodynamic notion of plane waves in	vacuum (including	g polarization
*	her 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	•	
	ence and their applications in interferometers. Based on the Fresnel diffraction integral, diffraction processes are presented in a graphican. Based on this diffraction principle, basic functioning of holography is clarified. Finally, the lecture unravels the geometrical optics limit		
	reach imaging, substitutive schema of a paraxial imaging system, and optical aberrations. It shows fundamentals of imaging in optical optical aberrations. It shows fundamentals of imaging in optical streams are supplied to the contract of		i geometricai
12ZEL1	Basic Electronics 1	Z,ZK	3
	des primary knowledge of circuit theory concerning principles of electronic circuits in both stationary and harmonic stable state. Circu	'	1 1
	e symbolic and complex method are explained. Proper circuit analysis is also lectured. The subject's final part deals with transient eff		
12ZEL2	Basic Electronics 2	Z,ZK	3
The subject follow	vs up with the Basic Electronics 1. Semiconductor elements basic properties are explained. Thecourse's final part deals with basic th	emes of logical ci	rcuits field.
12ZELD	Fundamentals of Electrodynamics	Z,ZK	2
Subject starts by	derivation of Maxwell-Lorentz microscopic equations followed by transition to Maxwell macroscopic theory. Using special theory of re	lativity formulae a	re found for
	eld vectors between two inertial systems of coordinates with appropriate invariants. Wave and Helmholtz equations are derived. By expan	•	
	of solving these equations are studied in homogeneous media with gradually increasing complexity: isotropic without losses, with abs		
	c. Finally, solution in weakly non-homogeneous madia is presented using the method of eiconal. Individual chapters are illustrated by		
12ZFD	Physical Data Visualization Vector graphics basics, scientific plots, dala visualization basics, measurements results presentation	KZ	2
12ZFP	Principles of Plasma Physics	Z.ZK	4
l l	ph temperature plasmas is explained using particle, kinetic and fluid approaches. It includes drift motions and adiabatic invariants, line	,	
	electromagnetic waves in inhomogeneous plasmas. Basic non-linear effects, such as ponderomotive force, self-focusing and parame		· ·
	comprises brief introduction into magnetohydrodynamics and nuclear fusion. Basics of atomic physics od multiply-ionized plasmas ar		
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 char	racterization.
	lecture discusses the basic physics and technology of optical waveguides; it introduces basic linear, nonlinear, and active structures		
	otical communications and sensors. Next, the attention is given to introduction of plasmonic structures and plasmonics, periodic struc	-	-
metamatenais, n	netasurfaces, and finally to photonic structures for quantum technologies. Finally, the lecture is closed with student presentations on excursions to selected photonic laboratories.	selected relevant i	lopics and
12ZMDT	Measurement and Data Processing	Z,ZK	2
	or the measurements and data processing and result interpretation: errors, precision, accuracy, normal distribution and its propeties,	'	
· ·	signal from the noise.	<u> </u>	
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, presentatio	ns and entire doc	uments in an
	office suite.		
15CH1	General Chemistry 1	Z	3
The most important	t concepts, quantities and units used in chemistry are introduced in the course General Chemistry I. Their significance and practical units used in chemistry are introduced in the course General Chemistry I. Their significance and practical units used in chemistry are introduced in the course General Chemistry I. Their significance and practical units used in chemistry are introduced in the course General Chemistry I. Their significance and practical units used in chemistry are introduced in the course General Chemistry I. Their significance and practical units used in chemistry are introduced in the course General Chemistry I. Their significance and practical units used in chemistry are introduced in the course General Chemistry II.	ise are illustrated	by examples
450110	solved in exercises.	7 714	
15CH2	General Chemistry 2 continuation of the course General chemistry I. The main attention is paid to general principles governing chemical processes. Using	Z,ZK	the feet that
•	continuation of the course General chemistry it. The main attention is paid to general principles governing chemical processes. Osing the principles is not restricted only to chemical processes is documented. The significance and practical use of explained principles are	•	
the validity of these	in exercises.	iliustrated by exar	Impies solved
18PJ	Programming in Java	Z,ZK	5
	This course is devoted to the Java platform and to the development of the basic types of applications for this platform.	, —,—. :	' '
18PRC1	Programming in C++ 1	Z	4
'	This course covers mainly the C programming language and non-object oriented features of the C++ language.	•	'
18PRC2	Programming in C++ 2	KZ	4
This co	ourse covers the object oriented programming and othesr advanced constructs in the C+;+ programming language and the Standard	Template Library.	.'
18PROP	Practical training in programming	KZ	3
-	ourse is to understand advanced topics related to programming, code design and software project development. Students will practic	· -	
principles on concre	ete real-world examples. Emphasis is put on the review of freely available software tools that can improve the programmer's work effi-	ciency and ensure	e high quality
40741.0	of the final source code.	7.71/	
18ZALG	Basics of Algorithmization	Z,ZK	4
	devoted to selected algorithms and methods for algorithm design. This course intruduces selected methods for the determination of	_	
18ZPRO Basics of Programming Z 4 This course is intended mainly for students with little or no experience in programming. It familiarizes the students with the basic concepts in programming and with the Python			
programming language.			
B0B36JUL	Julia for optimization and learning	KZ	4
l l	language is increasingly known by the community for its suitability in the field of numerical calculations. The course consists of two pages is increasingly known by the community for its suitability in the field of numerical calculations. The course consists of two pages is increasingly known by the community for its suitability in the field of numerical calculations. The course consists of two pages is increasingly known by the community for its suitability in the field of numerical calculations.	1	1
	second part introduces mathematical optimization and its application in machine learning, statistics and optimal control of differentia	-	•
shows the individu	al concepts of Julia, the second part combines them into longer logical sections of code. We explain each application theoretically. S	tudents are encor	uraged both

to write simple functions by themselves and compare them with already existing packages. The course ends with a final project. Students can either choose a topic connected to their theses or join a Kaggle competition with real data. This course is also part of the inter-university programme prg.ai Minor. It pools the best of Al education in Prague to provide students with a deeper and broader insight into the field of artificial intelligence. More information is available at https://prg.ai/minor.

man a deeper and product more the new or an another more more more more an analysis at mapo, project more				
	TV-1	Physical Education	Z	1
	TV-2	Physical Education	Z	1
	TV-3	Physical education	Z	1
	TV-4	Physical education	Z	1

For updated information see http://bilakniha.cvut.cz/en/FF.html Generated: day 2024-05-20, time 03:36.