Study plan

Name of study plan: Vy azování jaderných za ízení z provozu

Faculty/Institute/Others: Department: Branch of study guaranteed by the department: Welcome page Garantor of the study branch: Program of study: Decommissioning of Nuclear Facilities 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: Compulsory courses in the program Minimal number of credits of the block: 0 The role of the block: P

Code of the group: BSPVJZP1 Name of the group: BS P_VJZPB 1st year Requirement credits in the group: Requirement courses in the group: In this group you have to complete at least 14 courses Credits in the group: 0 Note on the group: Podmínkou skládání zkoušky 01MANZ je získání zápočtu z 01MAN. Podmínkou skládání

Podminkou skládání zkoušky U1MANZ je získání zápočtu z 01MAN. Podmínkou skládání zkoušky 01LALZ je získání zápočtu z 01LAL

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
02DEF1	History of Physics 1 Igor Jex Igor Jex (Gar.)	Z	2	2+0	Z	Р
02ELMA	Electricity and Magnetism Iskender Yalcinkaya, Ji í Hrivnák, Goce Chadzitaskos, Josef Schmidt, Jan Vysoký Jan Vysoký Ji í Hrivnák (Gar.)	Z,ZK	6	4+2	L	Ρ
01LAL	Linear Algebra 1 Petr Ambrož, Lubomíra Dvo áková Lubomíra Dvo áková Lubomíra Dvo áková (Gar.)	z	2	2P+2C		Ρ
01LALZ	Linear Algebra 1, exam Petr Ambrož, Lubomíra Dvo áková Lubomíra Dvo áková Lubomíra Dvo áková (Gar.)	ZK	2	0P+0C		Ρ
01LAL2	Linear Algebra 2 Petr Ambrož, Lubomíra Dvo áková Lubomíra Dvo áková Lubomíra Dvo áková (Gar.)	Z,ZK	4	2P+2C		Ρ
01MAN	Calculus 1 Pavel Strachota, Miroslav Kolá, Edita Pelantová Pavel Strachota Pavel Strachota (Gar.)	z	4	4+4		Ρ
01MANZ	Calculus 1, exam Pavel Strachota, Miroslav Kolá, Edita Pelantová Pavel Strachota Pavel Strachota (Gar.)	ZK	4	0P+0C		Ρ
01MAN2	Calculus 2 Miroslav Kolá, Edita Pelantová, Maksym Dreval Edita Pelantová Maksym Dreval (Gar.)	Z,ZK	8	4P+4C		Ρ
02MECH	Mechanics David B e Antonín Hoskovec David B e (Gar.)	Z	4	4+2	Z	Р
02MECHZ	Mechanics - Examination Iskender Yalcinkaya, Goce Chadzitaskos, Stanislav Skoupý, David B e , Filip Petrásek, Antonín Hoskovec, Petr Novotný Antonín Hoskovec David B e (Gar.)	ZK	2	-	Z	Ρ
15OCH	General Chemistry Petr Distler, Ond ej Holas Petr Distler Petr Distler (Gar.)	Z,ZK	6	5+2	Z	Р
00PT	Preparatory Week Petr Ambrož, Milan Krbálek Petr Ambrož Petr Ambrož (Gar.)	Z	2	týden	Z	Р
16UJRF1	Introductory Nuclear and Radiation Physics 1 Ladislav Musílek Ladislav Musílek (Gar.)	Z,ZK	4	2P+2C	L	Р

16ZOZ	Sources of Irradiation and Environment	кz	4	2P+2C	L	Р
	Št pán, Lenka Thinová Václav Št pán Václav Št pán (Gar.)					
Characteristic	s of the courses of this group of Study Plan: Code=BSPVJZP1 Name	=BS P_VJZF	PB 1st ye	ar		
02DEF1	History of Physics 1				Z	2
Physics and its pla	ice in the system of sciences. The relationship of man and nature. Natural sciences in ancient C	Prientand Greece	, Greek nat	ural philosoph	ers, Aristo	otle. Physics in
Helenistic period,	Archimed. Arabic science, European science in Middle Ages. Renaissance - da Vinci, Giordano	Bruno. Copernic	us, Kepler,	Galileo, Huyg	ens. The b	irth of physics
as experimental so	sience. Newton and his work.					
02ELMA	Electricity and Magnetism			Z	,ZK	6
Electric charge, Co	pulomb's law, electrostatic field, Gauss' law. Electric dipole, polarization. Conductors and dielect	trics. Electric curi	ent and circ	cuits, conducti	vity. Basics	s of the relativity
theory. Electrodyna	amic forces, magnetic field. Magnetic dipole, magnetics. Electromagnetic induction, RLC circuits	s. Electromagnet	ic waves, M	axwell equation	ons.	
01LAL	Linear Algebra 1				Ζ	2
1. Vector space. 2.	Linear dependence and independence. 3. Basis and dimension. 4. Subspaces of vector spaces	s. 5. Linear mapp	ings. 6. Mat	rices of linear	mappings	. 7. Frobenius
theorem.			0			
01LALZ	Linear Algebra 1, exam				ZK	2
01LAL2	Linear Algebra 2			Z	.ZK	4
Outline: 1. Inverse	matrix and operator. 2. Permutation and determinant. 3. Spectral theory (eigenvalue, eigenvector	or, diagonalizatio	n). 4. Hermi	tian and quad	ratic forms	s. 5. Scalar
product and orthog	gonality. 6. Metric geometry. 7. Riesz theorem and adjoint operator. Outline of the exercises: 1. N	lethods for calcu	lation of inv	erse matrices	. 2. Method	ds of calculation
of determinants. 3.	Calculation of eigenvalues and eigenvectors. 4. Hermitian and quadratic forms. Canonical form	. 5. Scalar produ	ct and ortho	ogonality. Calc	ulation of	orthogonal
complements. 6. G	eometry exercises and examples. 7. Adjoint operators.					
01MAN	Calculus 1				Ζ	4
Basic calculus (rea	al analysis, functions of one real variable, differential calculus).			I	1	
01MANZ	Calculus 1, exam				ZK	4
01MAN2	Calculus 2			Z	.ZK	8
1. Continuation of	differential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of converge	nce, operations of	on series, at	osolute and co	nditional o	convergence 3.
Real and complex	power series, the Cauchy-Hadamard theorem, expansion of function into power series, summat	ion of infinite ser	ies. 4. Theoi	ry of integrals:	primitives	, definite integral
(Riemann definitio	n), techniques of integration and application of integrals, Generalized Riemann integral					
02MECH	Mechanics				Z	4
Introduction to phy	sics, physical quantities and units. Kinematics of a particle, basic types of motion and their sup	erposition. Dynar	nics of a pa	rticle, solving	equations	of motion for
one-dimensional m	notion, motion in a central force field, forces in non-inertial reference frames. Mechanics of a systematic	stem of particles,	two-body p	oroblems, part	icle collisio	ons. Mechanics
of a rigid body, rota	ation.					
02MECHZ	Mechanics - Examination				ZK	2
The content of the	subject is the examination according to the plan of studies.			1	I	
15OCH	General Chemistry			Z	.ZK	6
General chemistry	, classification of substances, concentrations, chemical reactions and equations, stoichiometric	calculations, ato	ms and mol	ecules, chemi	cal bond,	the states of
matter, chemical th	ermodynamics, first law of thermodynamics, thermochemistry, second law of thermodynamics, e	ntropy, Gibbs ene	ergy, phase a	and chemical e	equilibria, e	electrochemistry
pH, reaction kineti	cs, kinetic equation, Arrhenius' equation.					
00PT	Preparatory Week				Z	2
16UJRF1	Introductory Nuclear and Radiation Physics 1			Z	,ZK	4
				!.	·	5

thematic areas: development of opinions on micro-wave and radiation physics, basic characteristics of the atom and nucleus, binding energy, measurement of mass and dimensions of the nuclei, the most important nuclear models. General characteristics of the interaction of ionizing radiation with the matter, interaction of alpha, beta, gamma and neutron radiation, passage of radiation beams through the matter, radiation effects in matter.

 16ZOZ
 Sources of Irradiation and Environment
 KZ
 4

The subject provides an overview of the usage of ionizing radiation from its discovery and first applications to modern methods. It allows the student to acquire the basic knowledge about ionizing radiation usage. The subject deals with the fundamental issues related to ionizing radiation and the safety of dealing with the sources of IR. The course includes practical exercises with processing the data and subsequent presentation of the results.

Code of the group: BSPVJZP2 Name of the group: BS P_VJZPB 2nd year Requirement credits in the group: Requirement courses in the group: In this group you have to complete at least 13 courses Credits in the group: 0 Note on the group: Předmět 16ZDOZ1 navazuje na předmět 16UJRF1.Zápis předmětu 15POBCH je podmíněn absolvováním předmětu 15OCH.

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
16DETE	Detectors of Ionizing Radiation Petr Pr ša Petr Pr ša Petr Pr ša (Gar.)	ZK	4	4+0	6	Р
15FCHN1	Physical Chemistry 1 Viliam Mú ka, Jan Bárta Jan Bárta Viliam Mú ka (Gar.)	Z,ZK	5	3+2	Z	Ρ
17JARE	Nuclear Reactors Tomáš Bílý Tomáš Bílý Tomáš Bílý (Gar.)	ZK	2	2	L	Р
01ANB3	Calculus B 3 Miroslav Kolá , Milan Krbálek Milan Krbálek Miroslav Kolá (Gar.)	Z,ZK	8	4P+4C		Р
01ANB4	Calculus B 4 Ji í Mikyška, Miroslav Kolá Ji í Mikyška	Z,ZK	6	2P+4C		Р

12NME1	Numerical Methods 1 Pavel Váchal Pavel Váchal (Gar.)	Z,ZK	4	2+2	L	Р	
15POBCH	Laboratory Exercises in General Chemistry Kate ina ubová, Miroslava Semelová Miroslava Semelová Kate ina ubová (Gar.)	KZ	3	3L	L	Р	
17TEK	Technical Drawing Dušan Kobylka Dušan Kobylka (Gar.)	KZ	3	1+2	L	Р	
16UJRF2	Introductory Nuclear and Radiation Physics 2 Ladislav Musílek Ladislav Musílek Ladislav Musílek (Gar.)	Z,ZK	4	2P+2C	Z	Р	
16ZEX	Basic Experiments in the Field of Radiation Detection Petr Pr ša Petr Pr ša Ji í Martin ík (Gar.)	KZ	2	2L	L	Р	
16ZDOZ1	Fundamentals of Radiation Dosimetry 1 Tomáš Trojek Tomáš Trojek (Gar.)	Z,ZK	4	2+2		Р	
18ZPRO	Basics of Programming Maksym Dreval, Nichita Vatamaniuc, Jan Vondruška, Vladimír Jarý, Miroslav Virius, Jakub Klinkovský, Petr Pauš, František Vold ich, Jan Tomsa, Miroslav Virius Miroslav Virius (Gar.)	Z	4	4C	Z	Р	
16ZRIZ	Health risks of ionizing radiation Marie Davídková Marie Davídková (Gar.)	ZK	2	2P+0C	L	Р	
Characteristics of the	courses of this group of Study Plan: Code=BSPVJZP2 Name=	BS P_VJZPE	3 2nd yea	ar			
16DETE De	tectors of Ionizing Radiation				ZK	4	
Gas filled detectors (ionizatio	n chambers, proportional counters, Geiger-Müller counters, corona counters), organic a	and inorganic scir	tillation det	ectors, Cher	enkov counter	s, evaluation	
of light by photomultiplier, pa	rameters of PMT, semiconductor detectors, cryogenic detectors.				71/		
The introductive part is devot	VSICAL CINEMISTRY 1 ed to the recanitulation of the thermodynamic systems and thermodynamic properties of	fideal and real of	ses Next c	hanters are (.,ZK	5 first second	
and third law of thermodynan	nics and their applications. Last but not least, attention is devoted also to the thermodyn	amic, phase and	chemical e	quilibriums a	s well as to th	e elementals	
of nonequilibrium thermodyn	amics.						
17JARE Nu	clear Reactors				ZK	2	
Introduction. World power iss	ue. Previous evolution of power reactor. Nuclear fission reactors, fuel assemblies, activ	e core, control sy	stems, safe	ty systems, o	containment. (Classification	
Western-type PWR (Westing	house. KWU. Framatom). VVER-type reactors . Temelín nuclear power plant. Boiling w	ater reactors. He	avv water r	eactors, fast	breeder react	tors.	
high-temperature gas cooled	reactors. Second nuclear era. reactors of generation III (EPR, AP-1000, VVER 1200).	Reactors of gene	eration IV: C	IF and INPF	O initiatives.	Evaluation	
and selection of proposed sy	stems. Six selected concepts. ICRP scenarios of word evolution, hydrogen power, role	of nuclear power	in long-ter	m outlook			
01ANB3 Ca	Iculus B 3			Z	"ZK	8	
1. Functional sequences and	series - convergence range, criteria of uniform convergence, continuity, limit, different	iation and integra	tion of func	tional series,	power series	, Series	
equation and exact equation)	and equations of higher order (fundamental system, reduction of order, variation of para	ameters, equation	is with cons	tant coefficie	ents and speci	al right-hand	
side, Euler differential equati	on). 3. Metric spaces - metric, norm, scalar product, neighborhood, interior and exterio	r points, boundar	y point, isol	ated and no	n-isolated poi	nt, boundary	
of set, completeness of space	e, Hilbert spaces. Orthogonal polynomials. Complete orthogonal systems. 4. Fourier ser	ies - expansion of	functions ir	nto Fourier se	eries, trigonon	netric Fourier	
series and their convergence	e. 5. Differential calculus of functions of several variables - limit, continuity, partial and d	lirectional derivati	ve, gradien	t, total deriva	tives and tan	gent plane,	
	Ins of vector analysis, Jacobi matrix. 6. Functions defined implicitly by one of several e	quations.		7	7K	6	
[1] Diferenciální po et funkcí	více prom nných a funkcionálních vektor . [2] Funkce zadané implicitn . [3] Taylorovy	 ady funkce více 	prom nný	−	,∠r∖ ární zobrazer	uí, zám na	
prom nných, nekartézské so	ustavy sou adnic. [5] Lokální, vázané a globální extrémy funkce více prom nných. [6]	Základy teorie mi	ry a obrys l	konstrukce L	ebesgueovy i	míry. [7]	
Integrální po et funkce více	prom nných - Riemann v a Lebesgue v integrál, základní vlastnosti, Fubiniova v ta, v	/ ta o substituci. I	_eviho a Le	besgueova v	 ta. Limita, sj 	oojitost a	
derivace integrálu podle para	ametru. [8] Integrály po k ivkách a plochách. Integrální v ty.				714		
12NME1 NU	Merical Methods 1	ortant for physics	and tochno	Logy Mothod	,ZK	4 of tasks yory	
important for physicists (ordi	nary differential equations, random numbers) are included in addition to the basic num	erical methods. Ir	and techno tegrated co	mputational	environment	MATLAB is	
used as a principle program	ning language as a demonstration tool. The seminars are held in computer laboratory.						
15POBCH Lat	poratory Exercises in General Chemistry				KZ	3	
Students are introduced to b	asic laboratory techniques in chemical lab. At the beginning, the health and safety train	ning in chemical/r	adiochemic	al labs as we	ell as the hand	lling of basic	
filtration preparing the buffer	cal scales, automatic pipettes, etc.) are required. During individual work students get the s and pH measurement and basic physical chamical properties of the solutions determ	knowledge of ba	sic chemica	l methods (p	recipitation, ci	ystallization,	
spectrophotometry, chromato	bgraphy or electrochemistry) are also tested.	induon). The tast	to using but	sic analytical	procedures (uuuuon,	
17TEK Tec	chnical Drawing				KZ	3	
This subject represents short	introduction into display methods, technical drawing in different fields and geography. T	he goal is to famil	iarize stude	nts with mult	idisciplinary f	undamentals	
so they were able to read an	d understand whatever drawing which describe nuclear facility (machine and its subsy-	stems, control sys	stem, etc.),	its building a	ind its equipm	ent (air	
with standardized formats an	indution, etc.) including site. Part of the course is also familiarization with digital systems indiconversions between systems.	IOI SIDIAGE OI UIAV	nings and a			i mornation,	
16UJRF2 Intr	oductory Nuclear and Radiation Physics 2			Z	.ZK	4	
The aim of the course is to p	rovide students with basic knowledge about atomic nucleus and radiation physics, which	h is followed by o	ther specia	lized lecture:	s. The subject	summarizes	
thematic areas: general properties of radioactive decay, alpha decay, proton radioactivity, beta decay, gamma emission, natural radioactivity, properties and types of nuclear reactions,							
167EX	reiements, thermonuclear reaction.				K7		
The aim of the course is to a	cquaint students with applications of ionizing radiation detectors and also with the prin	ciples of detection	n and spect	 rometrv of ic	nizina radiati	∠ on. Ionizina	
radiation detectors in this course is considered as a device which produces an evaluable signal at the time of interaction (unlike dosimeters). The aim of the course is to understand to							
basic principles of detection and calibration of common instruments in the field of ionizing radiation measurement.							
16ZDOZ1 Fu	ndamentals of Radiation Dosimetry 1			Z	,ZK	4	
History, development, and ob absorption, Eurodemontale of	pjectives of dosimetry. Quantities and units used for description of sources, fields, inter- the effects of ionizing radiation	actions of ionizing	radiation,	ionizations, e	energy transfe	r and	
187PRO Ro	sics of Programming				7	Δ	
This course is intended main	ly for students with little or no experience in programming. It familiarizes the students v	with the basic con	cepts in pro	l ogramming a	nd with the P	ython	
programming language.							

	alth ricks of ionizing radiation				74	2
The aim of the course is to a	cquaint students with the radiobiological basics of radiation protection. The basis of the	course is an intro	duction to th	 e biological	effects of ionizi	∠ ing radiation
(IR) at the molecular, cellular	r and tissue levels, an overview of deterministic and stochastic effects of ionizing radia	tion, health harm	, risk and its	evaluation,	basics of epide	emiology.
Code of the group	p: BSPVJZP3					
Name of the grou	ip: BS P_VJZPB 3rd year					
Requirement crea	dits in the group:					
Requirement cou	rses in the group: In this group you have to comple	ete at leas	t 12 co	urses		
Credits in the gro	up: 0					
Note on the group	p: Zkoušku z předmětu 01RMAF lze skládat až po složení	všech zkouš	šek z Ma	tematick	é analýzy a	a Lineárn
	algebry. Zápis 15JCHDC podmíněn absolvováním pře	edmětu 16U	JRF2. Za	ápis pře	dmětu 15Z	RP je
	16RAON navazuje na předměty 167RIZ 16U IRE12	1670071	sem pre	ametu i	SJCHDC.F	reamet
	Name of the course / Name of the group of courses					
Code	(in case of groups of courses the list of codes of their	Completion	Credits	Scope	Semester	Role
	Tutors, authors and guarantors (gar.)	· · · · · ·				
16BPV1	Bachelor Thesis 1	7	5	0+5	*	P
	Lenka Frýbortová (Gar.)	_		0.0		
16BPV2	Lenka Frýbortová (Gar.)	Z	10	0+10	*	Р
16EXKV	Excursion	Z	2	1XT	L	Р
	Nuclear Chemistry for DC	7 7K	4	2P+2C	7	P
	Xenie Lytvynenko, Jan John, Václav uba Václav uba Jan John (Gar.)	2,21		21 +20	2	Г
01NME2	Numerical Methods 2 Michal Beneš Michal Beneš Michal Beneš (Gar.)	KZ	2	2+0	L	Р
01PRST	Probability and Statistics Tomáš Hobza Tomáš Hobza Tomáš Hobza (Gar.)	Z,ZK	4	3+1	Z	Ρ
16RAON	Radiation Protection Ji í Martin ík, Tomáš Trojek, Darina Trojková, Ji í H Ika, Ladislav Tomášek Ji í Martin ík Tomáš Trojek (Gar.)	ZK	4	4+0	Z	Ρ
01RMAF	Equations of Mathematical Physics Václav Klika Václav Klika Václav Klika (Gar.)	Z,ZK	7	4P+2C		Р
14TEM	Engineering Mechanics Ji í Kunz Ji í Kunz Ji í Kunz (Gar.)	Z,ZK	6	4	5	Р
17BPJZ	Introduction to Nuclear Safety Lenka Frýbortová, ubomír Sklenka Lenka Frýbortová (Gar.)	ZK	2	2+0	L	Р
16UVJZ	Introduction to Decommissioning of Nuclear Facilities Lenka Thinová, Tomáš Trojek Lenka Thinová Lenka Thinová (Gar.)	Z,ZK	4	3P+1C	L	Р
15ZRP	Basic Laboratory Exercises in Radiochemistry Kate ina ubová, Miroslava Semelová Miroslava Semelová Kate ina ubová (Gar.)	КZ	2	2L	Z	Р

Characteristics of the courses of this group of Study Plan: Code=BSPVJZP3 Name=BS P_VJZPB 3rd year

16BPV1	Bachelor Thesis 1	Z	5			
The bachelor project is	pased on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the	project supervisor	during common			
regular meetings and d	scussions.					
16BPV2	Bachelor Thesis 2	Z	10			
The bachelor project is	pased on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the	project supervisor	during common			
regular meetings and d	scussions.					
16EXKV	Excursion	Z	2			
Excursion is focused or	enhancing skills in the use of decontamination methods, work with legislation and waste management and it takes several of	lays. Part of the e	xcursion will be			
a visit to one of the repo	sitories in the Czech Republic (Richard). Decontamination techniques will be tested in a special hall in SÚJCHBO v.v.i., Kam	enná-Milín. The d	ecommissioning			
of workplaces after the	nining of radioactive minerals will be demonstrated in the TÚU, DIAMO s., Stráž pod Ralskem. There will also be demonstrate	d in situ measure	ment techniques			
used to assess the rem	edial work, and their calibration. In cooperation with the SONS will be possible insight into the work of the emergency centers,	verification of inte	ernal emergency			
plans, and the legislativ	e framework for emergencies.					
15JCHDC	Nuclear Chemistry for DC	Z,ZK	4			
The following topics are	discussed in detail in the course: Nuclear reactions yield, reaction cross section. Fission reaction, spontaneous fission. Chem	nistry of atoms for	med in a nuclear			
reaction, local temperat	ure, atomic recoil and recoil energy, recoil of atom bound in a molecule, hot atom chemistry, retention, Szilard Chalmers read	ction.				
01NME2	Numerical Methods 2	KZ	2			
The course is devoted to	numerical solution of boundary-value problems and intial-boundary-value problems for ordinary and partial differential equation	ons. It explains me	thods converting			
boundary-value problem	ns to initial-value problems and finite-difference methods for elliptic, parabolic and first-order hyperbolic partial differential equation of the second	uations.				
01PRST	Probability and Statistics	Z,ZK	4			
It is a basic course of p	obability theory and mathematical statistics. The probability theory is build gradually beginning with the classical definition ar	nd continuing till th	ne Kolmogorov			
definition. The notions as random variable, distribution function of random variable and characteristics of random variable are treated and basic limit theorems are stated and proved.						
On the basis of this theory the basic methods of mathematical statistics such as estimation of distribution parameters and hypothesis testing are explained.						
16RAON	Radiation Protection	ZK	4			
The course covers the basic principles of radiation protection. It describes not only the current approaches but also points to future developments. The course is accepted as training,						
which allows obtaining special competence in radiation protection and learner receives appropriate certificate.						

01RMAF	Equations of Mathematical Physics	Z,ZK	7			
The subject of this cours	se is solving integral equations, theory of generalized functions, classification of partial differential equations, theory of integr	al transformations	, and solution of			
partial differential equat	ions (boundary value problem for eliptic PDE, mixed boundary problem for eliptic PDE).					
14TEM	Engineering Mechanics	Z,ZK	6			
Abstract: The course rep	presents a link-up between the theoretical mechanics of rigid bodies and engineering disciplines dealing with stress and stra	in analysis of real	structure parts			
(elasticity, plasticity, frac	ture mechanics, etc.). Principles of statics, kinematics, and dynamics and their application.					
17BPJZ	Introduction to Nuclear Safety	ZK	2			
The aim of the subject is	s to familiarize students with basic principles of nuclear safety.					
16UVJZ	Introduction to Decommissioning of Nuclear Facilities	Z,ZK	4			
The course aims to famil	liarise students with the actual decommissioning process. The syllabus of the subject is built in the sense of the actual course	of the preparatio	n and realization			
of the decommissioning	project. It includes implementation of site decommissioning including legislative requirements to protect employees and the	environment agai	nst radiation and			
waste management in t	neir categorization, transport, release to the environment and disposal. It deals with documentation and centralization of mor	itoring systems.				
15ZRP	Basic Laboratory Exercises in Radiochemistry	KZ	2			
This practical exercises are oriented on training of students in laboratory practice focusing on the manipulation with open sources within the working behind the shielding and in glovebox.						
Students are introduced into fundamental radiochemical techniques (dilution of radioactive solutions, extraction techniques, working with radionuclide generator). Students will gain						
practical knowledge in t	he field of decontamination (characterization of contamination, control smears and the methods of chemical decontaminatior	າ).				

Name of the block: Compulsory elective courses Minimal number of credits of the block: 0 The role of the block: PV

Code of the group: BSSPOLVEDY

Name of the group: BS - Social Sciences

Requirement credits in the group:

Requirement courses in the group: In this group you have to complete at least 1 course Credits in the group: 0

Note on the group:

Only one of these courses is obligatory.

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	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 Jana Ková ová (Gar.)	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

00EKOT	Economy in Technology	Z	1
The course introduces t	he basics of micro- and macroeconomics.		
00ETV	Ethics of Science and Technology	Z	1
00RET	Rhetoric	Z	1
The course is focused of	n 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 nonvert	al aspects. Stylistics exercises, strategies for coping with stage-fright and a short excursion into the history of rhetoric are an	n integral part of th	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:

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 Jana Ková ová, Slav na Brownová Jana Ková ová	ZK	4		Z	PV
04XAPZK	English for Advanced Students Examination Slav na Brownová, Darren Copeland Jana Ková ová	ZK	4		Z	PV

04XCESZZK	Czech for Foreigners Beginners - Examination Slav na Brownová Jana Ková ová Jana Ková ová (Gar.)	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 Jana Ková ová (Gar.)	ZK	4	Z	PV
04XFMZK	French for Intermediate Students Examination V ra Šlechtová V ra Šlechtová (Gar.)	ZK	4	Z	PV
04XFPZK	French for Advanced Students Examination V ra Šlechtová V ra Šlechtová (Gar.)	ZK	4	Z	PV
04XFZZK	French for Beginners Examination V ra Šlechtová V ra Šlechtová (Gar.)	ZK	3	L	PV
04XNMZK	German for Intermediate Students Examination Miloslava echová Miloslava echová Miloslava echová (Gar.)	ZK	4	Z	PV
04XNPZK	German for Advanced Students Examination Miloslava echová Miloslava echová Miloslava echová (Gar.)	ZK	4	Z	PV
04XRMZK	Russian for Intermediate Students Examination Zhanna Isaeva Zhanna Isaeva Zhanna Isaeva (Gar.)	ZK	4	Z	PV
04XRPZK	Russian for Advanced Students Examination Zhanna Isaeva Zhanna Isaeva Zhanna Isaeva (Gar.)	ZK	4	Z	PV
04XRZZK	Russian for Beginners Examination Zhanna Isaeva Zhanna Isaeva Zhanna Isaeva (Gar.)	ZK	3	L	PV
04XSMZK	Spanish for Intermediate Students Examination Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)	ZK	4	z	PV
04XSPZK	Spanish for Advanced Students Examination Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)	ZK	4	z	PV
04XSZZK	Spanish for Beginners Examination Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)	ZK	3	L	PV

Characteristics of the courses of this group of Study Plan: Code=BSPJAZYKYZK Name=BS P languages

04XAMZK	English for Intermediate Students Examination	ZK	4					
The course content is the	e examination as given by the study plan. The examination covers the AM1, AM2, and AM3 courses and consists of two par	ts - written (100 m	nin) and oral					
(20-30 min). The student is expected to master the AM syllabus and demonstrate the ability to apply their knowledge gained in the three English courses.								
04XAPZK	English for Advanced Students Examination	ZK	4					
The course content is th	e examination as given by the study plan. The student is supposed to demonstrate mastering the AP3 syllabus and the ability	to apply their know	wledge obtained					
in the three AP courses	. The examination consists of 2 parts - written (100 min) and oral (30 min) and includes also oral presentation of a topic from	the student's field	d of study.					
04XCESZZK	Czech for Foreigners Beginners - Examination	ZK	4					
The course content is the	, he examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of the 0	4XCESZ1,2,3 cou	rses and can					
only be taken after succ	essful completion of all three courses. Detailed information is to be obtained from the teacher.							
04XCESMZK	Czech for Intermediate Students Examination	ZK	4					
The course content is the	e examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of the C	ESM1,2,3 courses	s and can only					
be taken after successf	ul completion of the 3 courses. Detailed information is to be obtained from the teacher.							
04XCESPZK	Czech for Foreign Students - Advanced Examination	ZK	4					
The course content is the	e examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of the C	ESP1,2,3 courses	and can only					
be taken after successf	ul completion of the 3 courses. Detailed information is to be obtained from the teacher.							
04XFMZK	French for Intermediate Students Examination	ZK	4					
The content is the exam	ination as given by the study programme. The whole French programme is ended with an examination covering the contents	of FM1-FM3. The	e examination					
consists of a written and	d oral part and is organized according to Examination Instructions, a document available on the web.							
04XFPZK	French for Advanced Students Examination	ZK	4					
The whole French prog	am is ended with an examination covering the contents of FP1-FP3. The examination consists of a written and/or an oral part	t and is organized	according to					
Examination Instruction	s, a document available on the web. Assessment of the presentation is included into the examination grading.							
04XFZZK	French for Beginners Examination	ZK	3					
The content is the exam	ination as given by the study plan. The course is terminated with an examination consisting of oral and written part. The examination consisting of oral and written part. The examination consisting of oral and written part.	mination is ruled b	by the document					
Instruction for examinat	ion. Its content covers the levels FZ1 - FZ5.							
04XNMZK	German for Intermediate Students Examination	ZK	4					
The course content is th	e examination as given by the study plan. The whole German for Intermediate Students Course is completed by an examinati	on consisting of tv	vo parts - written					
and oral, which cover th	e courses NM1 - NM3. The oral part follows after passing the written part successfully and after obtaining the 04NM3 assess	sment. More detai	led information					
is to be obtained from the	ne teacher.							
04XNPZK	German for Advanced Students Examination	ZK	4					
The course content is the	, ne examination as given by the study plan. The whole German for Advanced Students Course is completed by an examinatio	n consisting of tw	o parts - written					
and oral, which cover th	e courses NP1 - NP3. The oral part follows after passing the written part successfully and after obtaining the 04NP3 ungrade	ed assessment. M	ore detailed					
information is to be obta	ained from the teacher.							
04XRMZK	Russian for Intermediate Students Examination	ZK	4					
The course content is the	e examination as given by the study plan. The course is completed by taking a written and oral examination testing the know	ledge 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 instructions by the teacher.								
04XRPZK	Russian for Advanced Students Examination	ZK	4					
The course content is the	e examination as given by the study plan. The course is completed by taking a written and oral examination testing the know	ledge 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 instructions by the teacher.								
04XRZZK	Russian for Beginners Examination	ZK	3					
The course content is the	he examination as given by the study plan. The course is completed by taking a written and oral examination testing the know	/ledge 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 instructions by the teacher.								

04XSMZK Spatial Spatia	anish for Intermediate Students Examination amination as given by the study plan. SMZK examination consists of two parts - written a	and oral; to be elig	ible for the v	vritten part,	ZK students will ha	4 ave obtained
04XSPZK Space Spac	anish for Advanced Students Examination and a students and a student a students and a students a students and a	oral and written. T	he prerequi	site for adm	ZK lission to oral p	4 part is having
passed the written test. Exam 04XSZZK Spa	nination content is based on syllabi of courses SP1, SP2, and SP3 or on an individual anish for Beginners Examination	study plan of the	student.		ZK	3
The course content is the exa passed the written examination	amination as given by the study plan. Examination consists of two parts - written and on test.	oral. Student can	register for o	oral examina	ation only if he/	she has
Name of the block	k: Elective courses					
Minimal number of	of credits of the block: 0					
The role of the blo	ock: V					
Code of the group	D: BSPVJZPV					
Name of the grou	p: BS P_VJZPB Optional courses					
Requirement cred	dits in the group:					
Credite in the gro	rses in the group:					
Noto on the group	up. 0					
	Name of the course / Name of the group of courses					I
Code	(in case of groups of courses the list of codes of their members) Tutors authors and quarantors (gar)	Completion	Credits	Scope	Semester	Role
02DEF2	History of Physics 2	Z	2	2+0	L	V
14FKO	Igor Jex Igor Jex (Gar.) Metal Physics Miroslav, Karlík, Jaroslav, ech Miroslav, Karlík, Miroslav, Karlík (Gar.)	Z,ZK	6	4P+2C		V
15FCHN2	Physical Chemistry 2 Barbora Drtinová Barbora Drtinová Václav uba (Gar.)	Z,ZK	5	3+2	Z	V
04AKS	English Conversation Jana Ková ová Jana Ková ová (Gar.)	Z	1	0+2	L	V
00MAM1	Essentials of High School Course 1 David B e	Z	1	0+1		V
00MAM2	Essentials of High School Math Course 2 Lukáš Heriban Severin Pošta Lukáš Heriban (Gar.)	Z	1	0+1		V
16PSE	Topical Dosimetry Seminar Kate ina Pila ová Kate ina Pila ová (Gar.)	Z	2	0P+2C		V
18PMTL	Programming in MATLAB Mat j Pokorný, Quang Van Tran, Jaromír Kukal Quang Van Tran Jaromír Kukal (Gar.)	КZ	4	4C	Z	V
01PSL	LaTeX - Publication Instrument Petr Ambrož Petr Ambrož Petr Ambrož (Gar.)	Z	2	0+2	L	V
TV-1	Physical Education	Z	1		Z	V
TV-2	Physical Education	Z	1		L	V
TV-3	Physical education	Z	1	0+2	Z	V
TV-4	Physical education	Z	1	0+2	L	V
16ZIVB	Introduction to Ecology Hana Pr šová Hana Pr šová (Gar.)	KZ	2	2+0	Z	V
01UP1	Introduction to Probability 1 Jan Vybiral Jan Vybiral Jan Vybiral (Gar.)	Z,ZK	3	1P+1C		V
01UP2	Introduction to Probability 2 Milan Krbálek, Michaela Krbálková Michaela Krbálková Milan Krbálek (Gar.)	Z,ZK	3	1P+1C		V
12ZEL1	Basic Electronics 1 Jaroslav Pavel Jaroslav Pavel Jaroslav Pavel (Gar.)	Z,ZK	3	2+1	Z	V
12ZEL2	Basic Electronics 2 Jaroslav Pavel Jaroslav Pavel Jaroslav Pavel (Gar.)	Z,ZK	3	2+1	L	V
02ZM1	Foundations of Physical Measurements 1 Solangel Rojas Torres, Petr Chaloupka Petr Chaloupka (Gar.)	ZK	2	2P+0C	Z	V
02ZM2	Poundations of Physical Measurements 2 Petr Chaloupka Petr Chaloupka (Gar.)	KZ	4	0P+4L	L	V
11ZFP	Basic to Solid State Physics Ladislav Kalvoda, Eva Mihóková Ladislav Kalvoda (Gar.)	ZK	3		Z	V
11ZFPL	Basic to Solid State Physics Eva Mihóková	КZ	2	26P+0C	Z	V
16ZPSP	Basic Work with PC Kamil Augsten Kamil Augsten (Gar.)	Z	2	0+2	1	V
16ZRAO	Basics of Radiation Protection Aneta Smejkalová Aneta Smejkalová Aneta Smejkalová (Gar.)	Z	2	2+0		V

Characteristics of	the courses of this group of Study Plan: Code=BSPVJZPV Name=BS P_VJZPB Optional c	ourses	
02DEF2	History of Physics 2	Z	2
Development of classic	al mechanics after Newton, Bernoulli's, Euler, Lagrange. Historical development of optics, corpuscular and wave approach. E	lectricity and mag	netism -
electrostatics, galvanisr	n, electrodynamics and electromagnetism, Faraday and Maxwell. Thermodynamics and its laws, statistical physics, Boltzman	n. The birth of mo	odern quantum
standard model The co	Planck and Einstein. Discovery of radioaktivity, structure of atom, atomic nucleus, Ruthenord and Boni. The way to nuclear e	nergy, Elementary	y particles,
	Metal Physics	7 7K	6
Abstract: The physical b	ackground of processes encountered in production and thermo-mechanical treatment of metallic materials is described, inclu	ding solidification	. crvstal defects.
theory of solid solutions	s, theory of dislocations, diffusion, hardening and softening of metals and alloys.	0	
15FCHN2	Physical Chemistry 2	Z,ZK	5
Lecture of Physical Che	mistry 2 focuses on thermodynamics of solutions, particularly on electolytes. Basics of colloidal chemistry extend the theory of	f solvents in the e	nd of the lecture.
04AKS	English Conversation	Z	1
The course will develop	the student's communication skills acquired throughout their previous studies. It aims to improve all aspects of oral commun	ication. The stude	ent will develop
their vocabulary for vari	ous communication situations and will master their communication strategy. They will also practise their listening skills in orde	er to better follow	and participate
		7	1
Students are introduced	to mathematical concepts and methods used in the introductory physics course	Ζ.	1
00MAM2	Essentials of High School Math Course 2	7	1
Review of basics of high	h school mathematics.		
16PSE	Topical Dosimetry Seminar	Z	2
The seminary is suppos	ed to motivate the students interest in the field of dosimetry and provide basic information about different applications of ionizir	ng radiation in scie	ence, in research
and in human life. The l	ectures are given by students and absolvents of DDAIR, who are currently employed at the department or in various organization	ations (SÚRO, v.v.	.i., ÚJF AV R
v.v.i., UJV ež, MI, Ho	pspital Na Homolce, FN v Motole, PTC Czech s.r.o., CERN, Fermilab). The lectures will focus not only on describing research	and current topic	cs in the field of
dosimetry, but students	will also learn more about Bachelor degree thesis topics and thus will learn more about their possible specialization during ti	he studies and att	erwards.
18PINIL	Programming in MATLAB	KZ	4
and geometric represer	internation of results.	alysis, statistics, a	algonumization
01PSI	LaTeX - Publication Instrument	7	2
The course is devoted t	o the basics and facilities of computer typography, particularly to the system LaTeX		-
TV-1	Physical Education	Z	1
TV-2	Physical Education	Z	1
TV-3	Physical education	Z	1
TV-4	Physical education	Z	1
16ZIVB	Introduction to Ecology	KZ	2
The subject inform abou	It basic of the ecologic principles, terms and ideas. It covers overview information regarding to particular components of the er	vironment and ev	aluate economic
indicators and sustainal	ble development.		
01UP1	Introduction to Probability 1	Z,ZK	3
1.Random trial with finit	e set of possible results, classical probability, independent random events 2. Probability and combinatorics 3. Probability and g	geometry, Bertran	ids paradox
4.Conditional probability	y, Bayes theorem, medical diagnosis, Simpsons paradox 5. Random variable with discrete state space, its distribution and me	an value 6.Proble	ems involving the
	Introduction to Drobability 2	7.7K	2
1 One-dimensional con	introduction to Frobability 2 itinuous random variable and its statistical description 2. Distribution function and probability density 3. Axiomatic introduction	n of probability ar	d connection to
measure theory. 4. Num	erical characteristics of continuous random variables. 5. Selected variants of continuous distributions and their characteristics	s. 6. Elementary n	nethods for point
estimations. 7. Generati	ing pseudorandom numbers from the selected distribution.	-	
12ZEL1	Basic Electronics 1	Z,ZK	3
The subject provides pr	mary knowledge of circuit theory concerning principles of electronic circuits in both stationary and harmonic stable state. Cir	cuit analysis meth	nods for linear
circuits include symbolic	c and complex method are explained. Proper circuit analysis is also lectured. The subject's final part deals with transient effect	ts inside linear ci	rcuits.
12ZEL2	Basic Electronics 2	Z,ZK	3
	with the Basic Electronics 1. Semiconductor elements basic properties are explained. The course's final part deals with basic	inemes of logical	circuits field.
UZZINI'I	FOUNDATIONS OF Physical measurements 1 for students of physical specializations (Experimental particle physics, Physical engineering, Nuclear engineering), hewever	it can be attende	Z
other branches. The go	al of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired d	lata on a PC. Stuc	dents learn the
basic habits of work in a	a physics lab.		
02ZM2	Foundations of Physical Measurements 2	KZ	4
The lecture is designed	for students of physical specializations (Experimental particle physics, Physical engineering, Nuclear engineering), however,	, it can be attende	d by students of
other branches. The goa	al of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired d	lata on a PC. Stuc	dents learn the
basic habits of work in a	a physics lab.		-
11ZFP	Basic to Solid State Physics	ZK	3
solids various types of a	ntal properties or solids following the regular long distance ordering of atoms in a crystal lattice. Based on the introduced bon	aing interaction b	etween atoms in
are derived. The periodi	ic potential of the crystal lattice is introduced and its relation to the following model describing the energetic state of electrons	in solids by mea	ns of electron
energy bands explained	I. The special consequences of band approach to the physical properties of solids are elucidated. The aim of the course is to	systematically int	troduce and
interpret a broad pheno	menological basis of physical properties of crystalline solids		
11ZFPL	Basic to Solid State Physics	KZ	2
Description of fundame	ntal properties of solids following the regular long distance ordering of atoms in a crystal lattice. Based on the introduced bon	ding interaction b	etween atoms in
solids, various types of o	crystals and their properties are defined. The model of crystalline lattice dynamics in harmonic approximation is described and b	asic thermal prop	erties of crystals
energy bands explained	to potential of the crystal lattice is infroduced and its relation to the following model describing the energetic state of electrons The special consequences of hand approach to the physical properties of solids are elucidated. The aim of the course is to	systematically in	troduce and
interpret a broad pheno	menological basis of physical properties of crystalline solids	cyclomatioally III	

16ZPSP Basic Work with PC	Z	2			
The aim of the course is to acquaint students with the basic skills related to working on a personal computer. The introductory part of the course is devoted to information systems a					
resources available at the CTU in Prague and the FNSPE. Emphasis is placed on effective handling of work with office productivity software (text editr	or, spreadsheet a	and presentation			
software) with exercises in MS Office. The practical content focuses mainly on further use during studies (laboratory reports, research work, bachelor	's and diploma th	neses) and in			
specific practice (hospitals, state administration, companies). Other sections summarize basic information about computer hardware, software, and see	curity. Completio	n of independen			
home exercises and participation in exercises above 60% is a necessary condition for passing the course.					
16ZRAO Basics of Radiation Protection	Z	2			

The aim of the course is to familiarize students with the general principles of radiation protection. The main emphasis is put on basic mechanisms and concepts, in order to allow critical orientation in this field. The course provides answers to the cardinal questions: What is ionizing radiation (IR), where it comes from, whether and how it is dangerous for people, what is the meaning of protective units (Gray, Sievert), how to prevent malicious effect of IR and many others. The content of the lectures does not require any prior knowledge.

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

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors. authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
04XAM1	English for Intermediate Students M1 Jana Ková ová	Z	2	0+2	Z	V
04XAM2	English for Intermediate Students M2 Jana Ková ová	Z	2	0+2	L	V
04XAM3	English for Intermediate Students M3 Jana Ková ová	Z	2	0+2	Z	V
04XAP1	English for Advanced Students P1 Jana Ková ová	Z	2	0+2	Z	V
04XAP2	English for Advanced Students P2 Jana Ková ová	Z	2	0+2	L	V
04XAP3	English for Advanced Students P3 Jana Ková ová	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 Jana Ková ová (Gar.)	Z	2	2S	Z	V
04XCESM1	Czech for Foreigners - Intermediate 1 Jana Ková ová Jana Ková ová (Gar.)	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 Jana Ková ová 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 Jana Ková ová 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 V ra Šlechtová (Gar.)	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 V ra Šlechtová (Gar.)	Z	2	0+2	Z	V
04XFZ1	French for Beginners Z1 V ra Šlechtová V ra Šlechtová (Gar.)	Z	2	0+4	L	V
04XFZ2	French for Beginners Z2 V ra Šlechtová V ra Šlechtová (Gar.)	Z	2	0+4	Z	V
04XFZ3	French for Beginners Z3 V ra Šlechtová V ra Šlechtová (Gar.)	Z	2	0+4	L	V
04XFZ4	French for Beginners Z4 V ra Šlechtová V ra Šlechtová (Gar.)	Z	2	0+4	Z	V

04XFZ5	French for Beginners Z5 V ra Šlechtová V ra Šlechtová (Gar.)	Z	2	0+4	L	V
04XNM2	German for Intermediate Students M2 Miloslava echová Miloslava echová (Gar.)	Z	2	0+2	L	V
04XNM1	German for Intermediate Students M1 Miloslava echová Miloslava echová (Gar.)	Z	2	0+2	Z	V
04XNM3	German for Intermediate Students M3 Miloslava echová Miloslava echová (Gar.)	Z	2	0+2	Z	V
04XNP1	German for Advanced Students P1 Miloslava echová Miloslava echová (Gar.)	Z	2	0+2	Z	V
04XNP2	German for Advanced Students P2 Miloslava echová Miloslava echová (Gar.)	Z	2	0+2	L	V
04XNP3	German for Advanced Students P3 Miloslava echová Miloslava echová (Gar.)	Z	2	0+2	Z	V
04XRM1	Russian for Intermediate Students M1 Zhanna Isaeva 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 Zhanna Isaeva Zhanna Isaeva (Gar.)	Z	2	0+2	Z	V
04XRP1	Russian for Advanced Students P1 Zhanna Isaeva 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 Zhanna Isaeva Zhanna Isaeva (Gar.)	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 Zhanna Isaeva 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 Zhanna Isaeva Zhanna Isaeva (Gar.)	Z	2	0+4	Z	V
04XRZ5	Russian for Beginners Z5 Zhanna Isaeva Zhanna Isaeva (Gar.)	Z	2	0+4	L	V
04XSM1	Spanish for Intermediate Students M1 Beatriz Vadillo Gonzalo 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 Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)	Z	2	0+2	Z	V
04XSP1	Spanish for Advanced Students P1 Beatriz Vadillo Gonzalo 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 Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)	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 Beatriz Vadillo Gonzalo 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 Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)	Z	2	0+4	Z	V
04XSZ5	Spanish for Beginners Z5 Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)	Z	2	0+4	L	V
Characteristics of the	courses of this group of Study Plan: Code=BSPJAZYKYZAP	Name=BS P i	azyky za	p		
04XAM1 En	glish for Intermediate Students M1		,,,	•	Z	2
The course is designed for st	udents who have successfully completed the full secondary school English language	course at least at	the A2 level	of the Com	mon Europear	n 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 and written communication situations. Thus it covers topics related to the student's life and people as well as topics of subtechnical interact. Attestics is also peid to						
extending the knowledge of grammar issues used in EAP.						
04XAM2 En	glish for Intermediate Students M2				Z	2
The AM2 course expects the	student to have completed the AM1 course. It develops their skills for work with subte	echnical texts, focu	using also m	ore on spec	cific grammar,	functions,
and lexical items typical of ES	P and EAP (e.g., definition, existence and classification of phenomena, object descript	ions). Part of the c	ourse is also	o guided writ	ting. If necessa	ary, grammar
	alich for Intermediate Studente M2				7	2
U4AAIVI3 EN	yiisi i iui iiiieiiiieuiale Sludents IVI3 s that enable students to cope with features tynical of professional style. Increasing atte	ntion is naid to de	veloping suk	 htechnical ve	∠ cabulary and	∠ independent
understanding of professiona	al texts. Great emphasis is placed on distinguishing different levels of formal and inform	nal oral and writte	n communio	cation and th	neir appropriat	e Czech
equivalents. The course also	includes studying abstracts and rules for writing them as well as basic rules for prepa	ring and giving a	short preser	ntation on a	chosen topic r	elated to the
student's field.						

04XAP1 English for Advanced Students P1	Z	2
The course is designed for students who have successfully completed the full secondary school English language course (at least the B1 level	of the Common Europ	ean Framework
of Reference for Languages - CEFR). It provides an introduction into English for Specific and Academic Purposes (ESP, EAP), i.e., into the fun	damentals of vocabula	ry, functions,
grammar, and style typical of professional oral and written communication situations (fundamentals of terms in mathematics and physics, defin	itions, graph descriptio	ns, etc). It also
covers professional oral and written communication on topics related to the undergraduate's life and needs. It develops skills for free professional	writing (writing a CV, let	er of application,
polite request). If necessary, revision of selected grammar topics is included.		
04XAP2 English for Advanced Students P2	Z	2
The AP2 course is based on AP1, thus extending the student's skills for working with subtechnical texts, and even with professional texts of ch	osen branches of scier	ice. According to
the students' needs it concentrates on chosen grammar topics, but mainly intends to develop understanding of syntactic structures and typical	rhetorical functions (e.	g., various types
of descriptions, and, if possible, a case study). Increasing emphasis is placed on the undergraduate's independent work with and reading of lir	guistically more demar	nding materials.
The course extends the student's subtechnical vocabulary, and includes fundamental notions of chosen branches of science. It is focused on fo	rmal writing including t	he sentence and
paragraph structure, linking, cohesion and coherence in texts.		
04XAP3 English for Advanced Students P3	Z	2
The AP3 course is based on AP2 and expects the student to work without any guidance with authentic professional materials and to interpret the	text. It includes training	oral and written
communication skills and functions (e.g., expressing an opinion, agreement, and objections; taking part in discussion, note-taking; summarizin	g, writing an abstract) a	ind, if possible,
also preparing a project on a given or chosen topic and presenting it. The course places emphasis on distinguishing levels of formal and inform	al language both in ora	al and written
communication.		
04XCESZ1 Czech for Foreigners - Beginners 1	Z	2
The course is designed for students of the English programme. Students will become acquainted with the main characteristics of Czech (phone	tic and grammar featur	es) and they will
acquire basic language and speaking skills. The course focuses on pronunciation exercises, simple social phrases, and oral and written comm	unication in the most co	ommon everyday
situations. The course covers roughly lessons 1-3 of eština Express (Czech Express) by L. Holá and P. Bo ilová.		
04XCESZ2 Czech for Foreigners - Beginners 2	Z	2
The language and communication competences acquired in CESZ1 are further developed. Students deepen their knowledge of the declension	and conjugation syste	m and practise
basic communication topics. The course covers roughly lessons 3-5 in Czech Express by L. Holá and P. Bo ilová.	, , , , , , , , , , , , , , , , , , , ,	
04XCES73 Czech for Enreigners - Beginners 3	7	2
The course further develops the language and computing incompetences acquired in the XCES71 and XCES72 courses. The teaching for	ises on building un bas	ic vocabularv
The consect pronunciation and deepening grammar features through practice as well as introducing the Czech culture Students are asked to	produce simple texts :	and they practise
request types of dialogue. They also practice understanding texts in terms of main ideas or looking for specific details in texts. The course cover	's roughly lessons 5-7 i	n eština expres
04VCESN1 Czoch for Egraignara Intermediate 1	7	2
UACES with Correct propulsities - intermediate 1	ling the student's vesal	
The course is locused on conect pronunciation, important morphological phenomena, prepositional phrases, and vero forms as well as on extern	ling the student's vocat	bulary for various
	7	0
U4XCESM2 Czech for Foreigners - Intermediate 2		
The course develops the topics covered in CESM1 and is then focused on more difficult grammar phenomena. It practices writing, speaking, a	nd reading skills and tra	ains the student
In understanding common abbreviations, abbreviated words, and mathematical terms and formulas.		
04XCESM3 Czech for Foreigners - Intermediate 3		2
The last course revises morphological topics covered earlier and extends the student's knowledge of more difficult language phenomena. It is	especially focused on s	stylistics 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 Communicative competences at least at level B2 of the	ion European Framewo	ork of Reference.
It is focused partly on revision of standard language structures, but mainly on practising more complex grammatical structures typical of the sty	le of science. Students	are taught the
basics of functional style of engineering and professional communication, both in spoken and written form. The topics include University Studie	s and Student Life. Wri	tten 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 techn	ical and specialist text	s 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 press	entation, and, finally, pr	esentation 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 both written and ora	l form. Students
will be able to communicate in social interaction and in academic, scientific and professional environment. They will be able to use the language	e to transmit general ar	nd technical
information and to solve problems. FM1 The course builds on and further develops linguistic competence acquired at secondary school. It revis	es, systemizes and ex	bands language
skills gained in previous study. The following topics are covered: University studies in our country and in France, writing of transactional letters, C	V, personal statement,	request, answer
to an advert, French culture and geography, Paris. Topics of specialization: mathematics, physics. Reading technical and popular science texts,	work based on these t	exts.
04XEM2 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 sc	ience texts, features tvr	bical for technical
and scientific language (passives, nominalization, word formation). Topics: physics, power engineering, environment, Internet, success of Fren	ch science and technol	oav. French
scientists, artists and architects. Description of an object, device, shapes, dimensions, material.		- 3),
04XEM3 Erench for Intermediate Students M3	7	2
The course is focused on improvement and further development of linguistic compatence acquired during the follow-up courses. Syntactic struct	ures (subordinate and i	nfinitive clauses
participle structures compound tenses) Text summary -Students prenare a written paper which will be delivered in form of an oral presentation	n 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 creation of the students' future specialisation of the students' future specialisation or to their interest and generally covers a technical /applied science topic. It is not a translation but a creation of the students' future specialisation or to their interest and generally covers a technical /applied science topic. It is not a translation but a creation of the students' future specialisation of the students'	tive work compiled fror	n French articles
and one's own knowledge/experienceLonger monologues on topics /situations set for the examination are prepared Text structure cohesion	and coherence	
04XEP1 French for Advanced Students P1	7	2
EP advanced course The objective of this three-semester course is to improve and further develop communication in the French longuage in h	oth written and oral for	n Studente will
he able to communicate in social interaction and in academic, scientific and work environment. They will be able to use the longuage to transm	it general and technical	information and
to solve problems. FP1 The course builds on and further develops linguistic competence acquired at secondary school. Difficult grammar topics	are repeated and eves	nded: subionctif
passé composé-imparfait, pronouns. The following specific tonics are covered. University studies in our country and in France, writing of transport	ctional letters CV per	sonal statement
request answer to an advert environmental issues success of French science and technology chosen topics from French regional culture. Pari	s Topics of specialization	on mathematice
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 c	n given topics. Fe	atures typical of
technical and scientific communication are stressed (passive voice, nominalization, word formation).	0	,,
04XEP3 French for Advanded Students P3	7	2
The course is focused on systemization and improvement of acquired linguistic competence, skills and knowledge and their use for communication in	l engineering envir	ronment Special
we consist in concession of shorter texts (both from and into the language). Writing of a paper and making oral presentation in-class The paper appendix	vers a technical /s	applied science
trained in a stantistic test of the manufacture in the tangenergy when get a paper and maximal of a presentation in the paper generally of trained in a stantistic stantist		
	7	2
$ 04A\Gamma Z $ Flench to beginners ZI		
French to beginners the objective of this 5-level course is to be able to communicate in French orally and in whiting in structures or everyday life, in	socializing and in	professional life.
The course includes reflection specific / technical communication and reading of popular science and scientific texts. F21 The objective is to be add	e lo communicale	al elementary
level, actively using the knowledge of chosen elementary language. The contents is foughly outlined by lessons 1 - 7 of the textbook Fravia - Prava	ova, riencii loi be	eginners
(Prancouzstina pro za ate ky), it is extended with situations of communication and functions from the textbook Espaces 1, lessons 1-4. Introductions	, personal morma	alion, asking and
giving the directions, simple instructions and questions. Special attention is paid to pronunciation. Spelling is explained in connection with pronuncia		
04XFZ2 French for Beginners Z2		2
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: Prav	/da - Pravdová :
French for Beginners . Additional topics and skills are filled in from the textbook Espaces I, lesson 1 - 5 (introductions, invitation, welcoming, agreem	ent - disagreemer	nt, apology,
thanking, travelling, map of France, food, expression of will, wish, order, prohibition, pleasure). Correct pronunciation is practiced. Stress on oral comm	iunication. Specific	c topics covered:
How does the machine work? A few expressions concerning the study. Name of University and Faculty.		
04XFZ3 French for Beginners Z3	Z	2
The course builts upon FZ2. Basic linguistic knowledge and skills are developed. The contents is given by lessons 14 - 18 of the textbook: Pravda - F	Pravdová: French	for Beginners.
Topics, functions and situations are complemented from other materials. Stress is put on oral communication in dialogues and on reading, both for in	nformation and lou	ud as part of
pronunciation practice. Reading covers short adapted texts of general interest first, and later popular science texts.		
04XFZ4 French for Beginners Z4	Z	2
The course builds up on FZ3. Basic linguistic knowledge and skills are further developed. Oral communication and reading skills are practiced. The of	contents is roughly	y covered with
lessons 19 - 23 of the textbook French for Beginners, and is expanded with topics and functions from other materials. Reading is developed from the le	cture notes French	h for Engineering
Students of FJFI. The course covers generals and specific topics: health- illness, sport, free time, environment, study, travelling in France, Paris, sho	pping, weather, u	niversity in our
country and in France, how to write CV, application, topics in mathematics, reading physics - mechanics, informatics, internet.		,
04XEZ5 French for Beginners Z5	7	2
All four skills acquired to a specific to a specific to the standard specific to the specific	v present it orally	in the class. The
ran dou sing acquire an 24 of a function of the taxthook. Pravdova Franch for Beginners and is complemented from other materials	Topics: on physics	from lecture
general contents is orceased by technology information, should have a frame is by semiral, and so complemented with syntax (subordinate of notes success of Franch science and technology information, should France Grammar is systemized and complemented with syntax (subordinate of	auses typical cor	nunctions
subinctive clauses and technology, mornation about rance. Cramma is systemized and complemented with syntax (subinduce of subinctive clauses)	auses, typical col	ijunotionis,
OdVNM2 Companies biological students M2	7	2
U4ANMZ German for intermediate Students MZ		
The course introduces other more complex grammatical structures and their application in communication based on technical texts, such as the relation	n between techno	nogy and society,
the world at the beginning of the 21st century, linguistically more demanding texts on the environment, the language of mathematics, computers and	I car technology e	etc. Students
practise reading for information and reading aloud, and appropriate language for various purposes in oral and written communication. The course system	natically revises of	ther grammatical
pnenomena important tor professional discourse (participies, relative clauses).		
04XNM1 German for Intermediate Students M1		2
The objective of the course is to level off the students' skills in the German language. The course focuses on revision of more difficult phenomena and	d structures (e.g.	the passive) and
word formation processes (e.g. importance of verb prefixes). In the lexical part, it covers topics referring to higher education in both the Czech Reput	blic and Germany	, current
environmental issues together with all necessary expressions and phrases, expressions and phrases needed to chemists, mathematicians, physicis	ts, and the fundar	mentals of IT
terminology. It develops communication on related topics and is aimed at correct pronunciation, grammatical correctness and understandability.		
04XNM3 German for Intermediate Students M3	Z	2
The course introduces other more complex grammatical structures and their application in communication based on technical texts, such as the relatio	n between techno	logy and society,
the world at the beginning of the 21st century, linguistically more demanding texts on the environment, the language of mathematics, computers and	1 car technology e	etc. Students
practise reading for information and reading aloud, and appropriate language for various purposes in oral and written communication. The course system	natically revises of	ther grammatical
phenomena important for professional discourse (participles, relative clauses).		
04XNP1 German for Advanced Students P1	Z	2
This course requires good grammar knowledge, extended general vocabulary, and good communication skills acquired at secondary school to be le	velled off at the b	eginning 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.		ŕ
04XNP2 German for Advanced Students P2	7	2
The course develops the students' skills in working with professional scientific texts (understanding, summarising, note-taking, interpreting) while extend	ding their general:	and subtechnical
vocabulary range It introduces mathematical expressions and texts of nuclear power engineering. Increasing emphasis is placed on understanding and	d practising formal	communication
both written and oral (CV, letter of application, interview, scholarship), and more complex grammatical structures (i.e., subjunctive, indirect speech).	- p - e - e - e - e - e - e - e - e - e	,
04YNP3 German for Advanced Students P3	7	2
U-ANY 5 German for Advanced Students of starting and the structure and technical tenical Students will develop their versionary in a version of a minimum structure structure attraction of the structure structure structure attraction of the structure struct		
The course consists of shall parts (general communicative structures, grammar and technical optics). Students will develop their vocadulary in a vicinity of the structure of th	anely of less comi	n fields such as
(traine protects and call accident report, ming in a form, complaints), based on presentations and technical and subtectimical texts, the v	d By means of a	n neius such as
nuclear power engineering, the environment, computer science, and car echnology, will also be extended. Only authentic professional texts are use		
stations are warred to process mornhauon gamed nom their reading of complex and dimodit texts and present it to the class in a simplified oral form. If practice to and from German	ne course also inc	กันนี้ยอ เปล่าเอเล่แบไไ
04VDM4 Duppion for Intermediate Chudente M4	7	
		<u>2</u>
I ne course is designed for students with previous knowledge of Russian from secondary schools. Students are supposed to know the Russian alphal	bet (both printed a	and handwritten),
pasic vocabulary for communication in everyday situations (introductions, socializing, greetings, shopping for food and objects of everyday need, ask	ing the way and g	iving airections),
they can use basic grammar structures (verbal and nominal forms, irregular verbs, pronouns). The initial knowledge corresponds to the achievement	ievel of the RZ2 (course. The
contents and scope or the course correspond approximately to the RZ3 course, but for half of the time allotted in the timetable.		
04XRM2 Russian for Intermediate Students M2	Z	2
The course is based on the RM1 course, its contents and scope correspond roughly to RZ4, however, for half of the time allotted in the timetable.		
04XRM3 Russian for Intermediate Students M3	Z	2
The course develops the knowledge and skills acquired in RM1 and RM2 and its contents and scope are roughly at the same level as those of RZ5, h	owever, for half of	the time allotted
in the timetable.		

04VDD4 Duration for Advance of Ourlands D4	7	0
04XRP1 Russian for Advanced Students P1	Z	2
The entrance requirement for the course is to achieve the B1 CEFR level. The objective of the course is revision of standard language structures, pi	acticing more diffi	icult grammar
structures, understanding the fundamentals of technical language and training writing skills.		
04XRP2 Russian for Advanced Students P2	Z	2
The course is based on RP1. It expands grammatical structures important for understanding technical texts (verbal adjectives, participles, passives,	verb aspects, spe	ecific syntactic
structures). Stress is put on independent oral and written communication.		
04YPD3 Puesian for Advanced Students D3	7	2
V4ARTS RUSSian IVI Auvaliced Students rS		
The course is based on RP2 and is mainly locused on working with technical and scientific texts freading comprehension, oral and written paraphra	sing, translation).	
courses require good previous knowledge of general language at secondary level (listening, reading, correct communication in everyday situations)	. The courses deve	elop and expand
these skills. Further study is aimed at professional and technical skills (reading technical literature according to the students' specialization, oral and	d written interpreta	ation). Students
develop their subtechnical vocabulary and practice quick and correct communication in professional situations. They will be able to both speak write	accurately and wi	th confidence on
technical topics.		
04XRZ1 Russian for Beginners Z1	Z	2
The course represents the first stage of the five-semester programme, its final aim being reading and understanding professional texts written in Rus	sian. Thus it begin	s with mastering
the Russian alphabet (for both reading and writing skills) and fundamentals of grammar necessary for everyday communication (listening and speal	kina). Students wil	be able to read
a short text with marked stress understand its contents and summarize it		
	7	2
V4ARZZ Russian ior beginners zz		
The second semester of the programme is designed to teach skills for basic communication in everyday situations and for reading easy and soft a	ubtechnical 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	r 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
The course is based on RZ2 and includes further everyday topics, develops understanding of short compact texts on new subtechnical topics (for trai	ning various forms	s of reading skills
and listening) and introduces new grammar. Students will be trained to distinguish intonation patterns while listening to spoken language. They will be	be able to respond	so as to be
understood, and to express their opinion. Writing skills will be trained on guided writing tasks and note-taking.		
0/VP7/ Durstian for Boginnore 7/	7	2
	_	∠
The course is based on R23. It improves and expands the knowledge of general language in all four skills (reading and understanding longer texts with	a certain percent	tage of unfamiliar
words, oral communication in everyday situations, writing longer texts). Students are trained to use grammar structures effectively (e.g., irregular ve	rbs, differences in	verb patterns
from Czech, modality, imperatives, conditionals). They practice and develop communication skills for everyday situations (food, travelling, free time),	and practice oral	and written
communication on more specific topics (environment, addictions, the green movement). They become acquainted with various geographical data (e	.g., Siberia), learn	how to fill in
forms, look up the information from the timetable, learn about Russian holidays and typical meals.		
04XR75 Russian for Beginners 75	7	2
The course expects the student to have completed R74. It concentrates predominantly on reading skills (working with professional texts, i.e. understa	nding extracting a	and summarizing
information from a specialized text) and speaking and to a certain extent, writing should be professional information obtained by reading the texts.	'ommunication ski	lls are trained on
momandor more a specialized reaction of speciality, and or design and reaching thread the procession and more and the procession of the special sp	on workel ediectiv	
every day topics, studying grammar is based on protessional and technical texts and only includes items typically used in protessional communication		es, participies,
passive voice). Students develop their technical and economic vocabulary, and are also trained in some professional skills (writing a CV, polite redu	est, etc.)	
04XSM1 Spanish for Intermediate Students M1	Z	2
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-sem	ester course deve	lops standard
vocabulary and pays attention to further grammar topics (e.g., perifrasis verbales, futuro imperfecto, direct object and indirect object pronouns, nega	ative form of the in	nperative, and
subjunctive), to written and oral communication on a given everyday or easy subtechnical topic, for which the students are trained by reading texts of	or listening to them	n.
04XSM2 Spanish for Intermediate Students M3	7	2
The course develops the students' knowledge from the previous course (SM1) Students are gradually acquainted with fundamentals of Spanish for		s in order to be
The course subscience is address in the period source (own). Clausing all gradually addressing and manufactures of operation of the period source (own).	specific purposed	
	7	-
04XSM3 Spanish for intermediate Students M3		L Z
The course books are supplemented with additional subtechnical materials, so the students will be gradually acquainted with the peculiarities of acad	lemic style. They v	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	Z	2
Course concentrates on more difficult grammar topics, revision of vocabulary, basics of Spanish for specific purposes as well as written communication	tion. Course prere	quisites: level B2
of CEER		1
AVOD		0
04XSP2 Spanish for Advanced Students P2		_ ∠
Course SP2 is the second part of the advanced Spanish course, extending Spanish for specific purposes topics. It comprises more grammar and sy	ntax and focuses	on independent
written communication.		
04XSP3 Spanish for Advanced Students P3	Z	2
Course SP3 is the final part of the advanced Spanish course. It is based on texts chosen by the students according to their future specialization. It is	focused on writter	n communication
based on what students will need in their career.		
04VS71 Spanish for Paginpare 71	7	2
04ASZI Spanisi ioi beginners zi	<u> </u>	∠
Course 52 its the list stage of the live-semester programme of Spanish studies, during the list stage the students will master prohetics and fundar	nentai grammar st	tructures 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 a	and will develop it.	1
04XSZ2 Spanish for Beginners Students Z2	Z	2
Course SZ2 is based on course SZ1, and expects students to develop and extend the knowledge and skills acquired so far. Grammar structures and	exis will be chosen	n 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 o	thers such as the	Czech Republic.
Realia of Spanish-speaking countries are also included.		
04XSZ3 Spanish for Beginners Z3	7	2
The course is based on course S72 and develops the student's vocabulary and grammar structure. The course covers realia (history and culture) of	I <u>~</u>	aking countries
mainly of Spain. It have attention to further grammar topics (protorite portacts, protorite indefinide, protorite importants, the correct and the importants.	(a) It includes we	ten and oral
manny or opam in pays alternion to runner grammar topics (pretenito penecito, pretenito intrelimito, pretenito impenecito, the gerund and the imperative communication on a given general topic, for which the student is trained by reading toyte or listening to them.	e, it includes writ	uen anu uidi
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
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 Span	ish speaking coun	ntries, mainly of
Spain. It pays attention to further grammar topics (perifrasis verbales, futuro imperfecto, direct object and indirect object pronouns, negative form of	the imperative, an	nd 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 hooks are supplemented with additional subtechnical materials, so the students will be gradually acquainted with populiarities of Spanic	h for specific pure	l <u>-</u>
nart the general Spanish course based on the course book will and with presentations and finally a written and oral evamination		
part, are general oparion oburou based on the oburou book will the with presentations and, illially, a written and that that illially is		

List of courses of this pass:

Code	Name of the course	Completion	Credits
00EKOT	Economy in Technology The course introduces the basics of micro- and macroeconomics.	Z	1
00ETV	Ethics of Science and Technology	Z	1
00MAM1	Essentials of High School Course 1 Students are introduced to mathematical concepts and methods used in the introductory physics course.	Z	1
00MAM2	Essentials of High School Math Course 2 Review of basics of high school mathematics.	Z	1
00PT	Preparatory Week	Z	2
00RET	Rhetoric	Z	1
The course is focu	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	nonverbal aspects. Stylistics exercises, strategies for coping with stage-fright and a short excursion into the history of rhetoric are an	integral part of the	e course.
00UPRA	Introduction to Law	Z	1
00UPSY	Introduction to Psychology	Z	1
01ANB3	Calculus B 3	Z,ZK	8
1. Functional seq	uences and series - convergence range, criteria of uniform convergence, continuity, limit, differentiation and integration of functional	series, power serie	es, Series
Expansion, Taylo	's theorem. 2. Ordinary differential equations - equations of first order (method of integration factor, equation of Bernoulli, separation	of variables, hom	ogeneous
equation and exact	equation) and equations of higher order (rundamental system, reduction of order, variation of parameters, equations with constant coe	fricients and specia	t boundary
of set, completenes	s of space. Hilbert spaces - Orthogonal polynomials. Complete orthogonal systems. 4. Fourier series - expansion of functions into Fouri	er series, trigonom	etric Fourier
series and their co	nvergence. 5. Differential calculus of functions of several variables - limit, continuity, partial and directional derivative, gradient, total of	lerivatives and tan	gent plane,
	Taylor series, elementary terms of vector analysis, Jacobi matrix. 6. Functions defined implicitly by one or several equations	6.	
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] F	Regulární zobrazer	ní, zám na
prom nných, neł	artézské soustavy sou adnic. [5] Lokální, vázané a globální extrémy funkce více prom nných. [6] Základy teorie míry a obrys konstr	ukce Lebesgueov	/ míry. [7]
Integrální po et fu	inkce více prom nných - Riemann v a Lebesgue v integrál, základní vlastnosti, Fubiniova v ta, v ta o substituci. Leviho a Lebesgu	eova v ta. Limita, :	spojitost a
041.41	derivace integralu podle parametru. [8] Integraly po k ivkach a piochach. Integralni v ty.	-	0
UTLAL	Linear dependence and independence 2. Basis and dimension 4. Subspace of visitor appage 5. Linear mappings 6. Matrices of L		Z
1. Vector space. 2	theorem	inear mappings. 7.	FIODEIIIUS
01LAL2	Linear Algebra 2	7 7K	4
Outline: 1. Invers	e matrix and operator. 2. Permutation and determinant. 3. Spectral theory (eigenvalue, eigenvector, diagonalization). 4. Hermitian an	d quadratic forms.	5. Scalar
product and orthog	onality. 6. Metric geometry. 7. Riesz theorem and adjoint operator. Outline of the exercises: 1. Methods for calculation of inverse matr	ices. 2. Methods of	calculation
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
Real and complex r	sinterential calculus: laylor s Polynomials, laylor s formula 2. Infinite series: criteria of convergence, operations on series, absolute an	a conditional conv	ergence 3.
	(Riemann definition). techniques of integration and application of integrals. Generalized Riemann integral	als. primitives, der	inte integrai
01MANZ	Calculus 1, exam	ZK	4
01NME2	Numerical Methods 2	KZ	2
The course is devot	ed to numerical solution of boundary-value problems and intial-boundary-value problems for ordinary and partial differential equations.	It explains method	s converting
bound	ary-value problems to initial-value problems and finite-difference methods for elliptic, parabolic and first-order hyperbolic partial difference methods for elliptic, parabolic and first-order hyperbolic partial difference methods for elliptic, parabolic and first-order hyperbolic partial difference methods for elliptic, parabolic and first-order hyperbolic partial difference methods for elliptic, parabolic and first-order hyperbolic partial difference methods for elliptic, parabolic and first-order hyperbolic partial difference methods for elliptic, parabolic and first-order hyperbolic partial difference methods for elliptic, parabolic and first-order hyperbolic partial difference methods for elliptic, parabolic and first-order hyperbolic partial difference methods for elliptic, parabolic and first-order hyperbolic partial difference methods for elliptic, parabolic and first-order hyperbolic partial difference methods for elliptic, parabolic and first-order hyperbolic partial difference methods for elliptic, parabolic and first-order hyperbolic partial difference methods for elliptic, parabolic and first-order hyperbolic partial difference methods for elliptic, parabolic and first-order hyperbolic partial difference methods for elliptic, parabolic and first-order hyperbolic partial difference methods for elliptic, parabolic and first-order hyperbolic and first-order hyperbol	rential equations.	
01PRST	Probability and Statistics	Z,ZK	4
It is a basic course	of probability theory and mathematical statistics. The probability theory is build gradually beginning with the classical definition and	continuing till the k	Colmogorov
definition. The notio	ons as random variable, distribution function of random variable and characteristics of random variable are treated and basic limit the	orems are stated a	and proved.
	a basis of this theory the basic methods of mathematical statistics such as estimation of distribution parameters and hypothesis testing		2
UIF3L	La IEA - FUDIICaLIOIT ITISTI UTIETIL The course is devoted to the basics and facilities of computer typography, particularly to the system LaTeX		2
	Fountions of Mathematical Drugics	7 7K	7
The subject of this	course is solving integral equations, theory of generalized functions, classification of partial differential equations, theory of integral tr	ansformations, and	d solution of
	partial differential equations (boundary value problem for eliptic PDE, mixed boundary problem for eliptic PDE).	,,	
01UP1	Introduction to Probability 1	Z,ZK	3
1.Random trial w	ith finite set of possible results, classical probability, independent random events 2. Probability and combinatorics 3. Probability and g	eometry, Bertrands	s paradox
4.Conditional proba	bility, Bayes theorem, medical diagnosis, Simpsons paradox 5. Random variable with discrete state space, its distribution and mean	value 6.Problems i	nvolving the
	calculation of mean value 7. Probabilistic method in graph theory 8. Random algorithms, Morris algorithm and its variants		
01UP2	Introduction to Probability 2	Z,ZK	3
1. One-dimensiona	continuous random variable and its statistical description. 2. Distribution function and probability density. 3. Axiomatic introduction of	r probability and co	onnection to
measure theory. 4. I	vumencal characteristics of continuous random variables. 5. Selected variants of continuous distributions and their characteristics. 6. estimations 7 Generating pseudorandom numbers from the selected distribution	Elementary metho	ous ior point
	כאוווימנוסאס. ד. סטובומנווש אסבעעטומוועטווו וועוווטבוס ווטווו נווב סבובטבע עוטנווטענוטוו.		

02DEF1	History of Physics 1	Z	2
Physics and its pl	ace in the system of sciences. The relationship of man and nature. Natural sciences in ancient Orientand Greece, Greek natural philo Archimed Arabia science, European science in Middle Aces, Banaissance, da Vinci, Cierdane Prune, Constrainty, Kapler, Celika, K	sophers, Aristotle.	Physics in
Helenistic period,	as experimental science. Newton and his work.	huygens. The birth	or physics
02DEF2	History of Physics 2	Z	2
Development of	f classical mechanics after Newton, Bernoulli's, Euler, Lagrange. Historical development of optics, corpuscular and wave approach. E	lectricity and magr	netism -
electrostatics, gal	vanism, electrodynamics and electromagnetism, Faraday and Maxwell. Thermodynamics and its laws, statistical physics, Boltzmann.	The birth of moder	n quantum
and relativistic p	hysics, Planck and Einstein. Discovery of radioaktivity, structure of atom, atomic nucleus, Rutherford and Bohr. The way to nuclear er	iergy, Elementary p	particles,
	Standard model. The concept of Nature and Oniverse of today.	774	6
UZELIVIA	LIECTION AND MAGNETSTIC STREET, AND LIECTION AND MAGNETISTI AND MAGNETISTIC AND A CONTRACT AND CONTRACT	Luctivity Basics of t	0 he relativity
theory.	Electrodynamic forces, magnetic field. Magnetic dipole, magnetics. Electromagnetic induction, RLC circuits. Electromagnetic waves, I	Maxwell equations.	ine relativity
02MECH	Mechanics	Z	4
Introduction to ph	ysics, physical quantities and units. Kinematics of a particle, basic types of motion and their superposition. Dynamics of a particle, so	lving equations of	motion for
one-dimensional r	notion, motion in a central force field, forces in non-inertial reference frames. Mechanics of a system of particles, two-body problems,	particle collisions.	Mechanics
	of a rigid body, rotation.		
02MECHZ	Mechanics - Examination	ZK	2
007144	I ne content of the subject is the examination according to the plan of studies.	71/	
UZZIVI1 The lecture is desi	FOUNDATIONS OF Physical Measurements 1 and for students of physical specializations (Experimental particle physics, Physical operanding, Nuclear operanding, however, it of		Z students of
other branches. T	he goal of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired data	a on a PC. Student	s learn the
	basic habits of work in a physics lab.		
02ZM2	Foundations of Physical Measurements 2	KZ	4
The lecture is desi	gned for students of physical specializations (Experimental particle physics, Physical engineering, Nuclear engineering), however, it c	an be attended by	students of
other branches. T	he goal of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired data	a on a PC. Students	s learn the
	basic habits of work in a physics lab.		
04AKS	English Conversation		1
their vocabulary fo	weiop the student's communication skills acquired throughout their previous studies. It aims to improve all aspects of oral communication strategy They will also practise their listening skills in order to	ation. The student w	narticipate
in d	iscussions. The student will be trained to express their ideas clearly and according to current English usage, and become a more con	ifident speaker.	participate
04XAM1	English for Intermediate Students M1	Z	2
The course is desig	gned for students who have successfully completed the full secondary school English language course at least at the A2 level of the C	ommon European	Framework
of Reference for La	anguages (CEFR). It provides an introduction into English for Specific and Academic Purposes (ESP, EAP), i.e., into fundamentals of	vocabulary and sty	le typical of
professional oral a	and written communication situations. Thus it covers topics related to the student's life and needs as well as topics of subtechnical int	erest. Attention is a	llso paid to
0.43/4.140	extending the knowledge of grammar issues used in EAP.		
04XAM2	English for intermediate Students M2		2 functions
and lexical items tv	pical of ESP and EAP (e.g., definition, existence and classification of phenomena, object descriptions). Part of the course is also guided	writing. If necessar	rv. arammar
,	revision is included.	5	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
04XAM3	English for Intermediate Students M3	Z	2
The course develop	os the skills that enable students to cope with features typical of professional style. Increasing attention is paid to developing subtechnic	al vocabulary and ir	ndependent
understanding of	professional texts. Great emphasis is placed on distinguishing different levels of formal and informal oral and written communication	and their appropria	ate Czech
equivalents. The co	ourse also includes studying abstracts and rules for writing them as well as basic rules for preparing and giving a short presentation o	n a cnosen topic re	lated to the
ΟΛΧΑΜΖΚ	English for Intermediate Students Examination	7K	Λ
The course cont	ent is the examination as given by the study plan. The examination covers the AM1, AM2, and AM3 courses and consists of two parts	ا ۲۰۰ - ۲۰۰ s - written (100 min)) and oral
(20-	30 min). The student is expected to master the AM syllabus and demonstrate the ability to apply their knowledge gained in the three E	English courses.	
04XAP1	English for Advanced Students P1	Z	2
The course is desi	gned for students who have successfully completed the full secondary school English language course (at least the B1 level of the C	ommon European	Framework
of Reference for	Languages - CEFR). It provides an introduction into English for Specific and Academic Purposes (ESP, EAP), i.e., into the fundament	tals of vocabulary, f	functions,
grammar, and sty	e typical of professional oral and written communication situations (fundamentals of terms in mathematics and physics, definitions, gi Loral and written communication on topics related to the undergraduate's life and needs. It develops skills for free professional writing (w	raph descriptions, e	etc). It also
covers professiona	polite request). If necessary, revision of selected arammar topics is included.		application,
04XAP2	English for Advanced Students P2	Z	2
The AP2 course is	based on AP1, thus extending the student's skills for working with subtechnical texts, and even with professional texts of chosen brai	nches of science. A	ccording to
the students' need	s it concentrates on chosen grammar topics, but mainly intends to develop understanding of syntactic structures and typical rhetorica	I functions (e.g., va	arious types
of descriptions, an	d, if possible, a case study). Increasing emphasis is placed on the undergraduate's independent work with and reading of linguistical	ly more demanding	materials.
The course extend	s the student's subtechnical vocabulary, and includes fundamental notions of chosen branches of science. It is focused on formal writi	ing including the se	entence and
04ΧΔΡ3	English for Advanced Students P3	7	2
The AP3 course is	based on AP2 and expects the student to work without any guidance with authentic professional materials and to interpret the text. It in	cludes training oral	and written
communication sk	ills and functions (e.g., expressing an opinion, agreement, and objections; taking part in discussion, note-taking; summarizing, writing	an abstract) and,	if possible,
also preparing a	project on a given or chosen topic and presenting it. The course places emphasis on distinguishing levels of formal and informal lang	uage both in oral a	nd written
	communication.	·	
04XAPZK	English for Advanced Students Examination	ZK	4
The course conten	t is the examination as given by the study plan. The student is supposed to demonstrate mastering the AP3 syllabus and the ability to a	pply their knowledge	ge obtained
	Croch for Economero Intermedicto 4		oi siddy.
The course is focus	ed on correct pronunciation, important morphological phenomena, prepositional phrases, and verb forms as well as on extending the standard the stand	tudent´s vocabuları	∠ for various
	social situations.		

04XCESM2	Czech for Foreigners - Intermediate 2	Z	2
The course develo	ps the topics covered in CESM1 and is then focused on more difficult grammar phenomena. It practices writing, speaking, and readir	ng skills and trains	the student
	in understanding common abbreviations, abbreviated words, and mathematical terms and formulas.		1
04XCESM3	Czech for Foreigners - Intermediate 3	Z	2
The last course r	evises morphological topics covered earlier and extends the student's knowledge of more difficult language phenomena. It is especial	ally focused on sty	listics and
	lexicology and on developing the student's writing skills.	71/	4
04XCESMZK	UZECN for Intermediate Students Examination		4
The course conter	to be taken after successful completion of the 3 courses. Detailed information is to be obtained from the teacher	Sivi 1,2,3 Courses a	IU Call Only
04XCESP1	Czech for Foreign Students - Advanced 1	7	2
The prerequisite of	the course is very good knowledge of the Czech language, i.e., communicative competences at least at level B2 of the Common Europ	pean Framework o	f Reference.
It is focused partly	on revision of standard language structures, but mainly on practising more complex grammatical structures typical of the style of sci	ence. Students are	e taught the
basics of function	nal style of engineering and professional communication, both in spoken and written form. The topics include University Studies and S	Student Life. Writte	n practice
	includes communication with teachers and faculty administrators.	_	1
04XCESP2	Czech for Foreigners - Advanced 2	Z	2
This course extend	is the student's knowledge acquired in CESP1 and tocuses on difficult language phenomena. It practises working with technical and	specialist texts pla	cing greater
	Czech for Foreigners - Advanced 3	7	2
The course develor	b the student's knowledge from CESP2. It includes working with authentic specialist materials, their interpretation and presentation a	and finally presen	tation of the
	student's project. Writing skills necessary for professional communication are trained.	,	
04XCESPZK	Czech for Foreign Students - Advanced Examination	ZK	4
The course conte	nt is the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of the CES	P1,2,3 courses ar	nd can only
	be taken after successful completion of the 3 courses. Detailed information is to be obtained from the teacher.		
04XCESZ1	Czech for Foreigners - Beginners 1	Z	2
The course is desig	gned for students of the English programme. Students will become acquainted with the main characteristics of Czech (phonetic and g	rammar features) a	and they will
acquire basic langu	Jage and speaking skills. The course focuses on pronunciation exercises, simple social phrases, and oral and written communication	in the most comm	on everyday
04205070	situations. The course covers roughly lessons 1-3 of estina Express (Czech Express) by L. Hola and P. Bo llova.	7	<u> </u>
	UZECN IOF FOREIGNERS - BEGINNERS 2	L Z	
The language and	basic communication topics. The course covers roughly lessons 3-5 in Czech Express by L. Holá and P. Bo ilová.	ijugation system a	inu practise
04XCESZ3	Czech for Foreigners - Beginners 3	7	2
The course furthe	er develops the language and communication competences acquired in the XCESZ1 and XCESZ2 courses. The teaching focuses on	ا ۔ building up basic ۱	/ocabulary,
fixing correct pronu	inciation and deepening grammar, features through practice, as well as introducing the Czech culture. Students are asked to produce	simple texts and t	hey practise
frequent types of di	alogue. They also practise understanding texts in terms of main ideas or looking for specific details in texts. The course covers roughly	lessons 5-7 in e	ština expres
	1		
04XCESZZK	Czech for Foreigners Beginners - Examination	ZK	4
04XCESZZK The course conte	Czech for Foreigners Beginners - Examination ent is the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of the 04X only be taken after successful completion of all three courses. Detailed information is to be obtained from the teacher	ZK CESZ1,2,3 course	4 es and can
04XCESZZK The course conte	Czech for Foreigners Beginners - Examination Int is the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of the 04X only be taken after successful completion of all three courses. Detailed information is to be obtained from the teacher. French for Intermediate Students M1	ZK CESZ1,2,3 course 7	4 es and can
04XCESZZK The course conte 04XFM1 French - intermedia	Czech for Foreigners Beginners - Examination Int is the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of the 04X only be taken after successful completion of all three courses. Detailed information is to be obtained from the teacher. French for Intermediate Students M1 ate FM The objective of this three-semester course is to improve and further develop communication in the French language in both v	ZK CESZ1,2,3 course Z written and oral for	4 es and can 2 m. Students
04XCESZZK The course conte 04XFM1 French - intermedia will be able to co	Czech for Foreigners Beginners - Examination ent is the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of the 04X only be taken after successful completion of all three courses. Detailed information is to be obtained from the teacher. French for Intermediate Students M1 ate FM The objective of this three-semester course is to improve and further develop communication in the French language in both v mmunicate in social interaction and in academic, scientific and professional environment. They will be able to use the language to tra	ZK CESZ1,2,3 course Z written and oral for unsmit general and	4 es and can 2 m. Students technical
04XCESZZK The course conte 04XFM1 French - intermedia will be able to co information and to	Czech for Foreigners Beginners - Examination ant is the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of the 04X only be taken after successful completion of all three courses. Detailed information is to be obtained from the teacher. French for Intermediate Students M1 ate FM The objective of this three-semester course is to improve and further develop communication in the French language in both o mmunicate in social interaction and in academic, scientific and professional environment. They will be able to use the language to tra solve problems. FM1 The course builds on and further develops linguistic competence acquired at secondary school. It revises, syste	ZK CESZ1,2,3 course Z written and oral for unsmit general and emizes and expand	4 es and can 2 m. Students technical ds language
04XCESZZK The course conte 04XFM1 French - intermedia will be able to co information and to skills gained in prev	Czech for Foreigners Beginners - Examination int is the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of the 04X only be taken after successful completion of all three courses. Detailed information is to be obtained from the teacher. French for Intermediate Students M1 ate FM The objective of this three-semester course is to improve and further develop communication in the French language in both v mmunicate in social interaction and in academic, scientific and professional environment. They will be able to use the language to tra solve problems. FM1 The course builds on and further develops linguistic competence acquired at secondary school. It revises, syste vious study. The following topics are covered: University studies in our country and in France, writing of transactional letters, CV, persor	ZK CESZ1,2,3 course Z written and oral for unsmit general and emizes and expand nal statement, requ	4 es and can 2 m. Students technical ds language uest, answer
04XCESZZK The course conte 04XFM1 French - intermedia will be able to co information and to skills gained in prev to an advert,	Czech for Foreigners Beginners - Examination int is the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of the 04X only be taken after successful completion of all three courses. Detailed information is to be obtained from the teacher. French for Intermediate Students M1 ate FM The objective of this three-semester course is to improve and further develop communication in the French language in both v ommunicate in social interaction and in academic, scientific and professional environment. They will be able to use the language to tra solve problems. FM1 The course builds on and further develops linguistic competence acquired at secondary school. It revises, syste vious study. The following topics are covered: University studies in our country and in France, writing of transactional letters, CV, person French culture and geography, Paris. Topics of specialization: mathematics, physics. Reading technical and popular science texts, wo	ZK CESZ1,2,3 course Z written and oral for unsmit general and emizes and expand nal statement, requ ork based on these	4 es and can 2 m. Students technical ds language uest, answer e texts.
04XCESZZK The course conte 04XFM1 French - intermedia will be able to co information and to skills gained in prev to an advert, 04XFM2	Czech for Foreigners Beginners - Examination Int is the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of the 04X Only be taken after successful completion of all three courses. Detailed information is to be obtained from the teacher. French for Intermediate Students M1 ate FM The objective of this three-semester course is to improve and further develop communication in the French language in both v mmunicate in social interaction and in academic, scientific and professional environment. They will be able to use the language to tra solve problems. FM1 The course builds on and further develops linguistic competence acquired at secondary school. It revises, syste vious study. The following topics are covered: University studies in our country and in France, writing of transactional letters, CV, person French culture and geography, Paris. Topics of specialization: mathematics, physics. Reading technical and popular science texts, we French for Intermediate Students M2	ZK CESZ1,2,3 course Z written and oral for ansmit general and emizes and expand mal statement, requ prk based on these Z	4 es and can 2 m. Students technical ds language uest, answer e texts. 2
04XCESZZK The course conter 04XFM1 French - intermedia will be able to co information and to skills gained in prev to an advert, 04XFM2 Course FM2 builds and scientific lar	Czech for Foreigners Beginners - Examination Int is the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of the 04X Only be taken after successful completion of all three courses. Detailed information is to be obtained from the teacher. French for Intermediate Students M1 ate FM The objective of this three-semester course is to improve and further develop communication in the French language in both v mmunicate in social interaction and in academic, scientific and professional environment. They will be able to use the language to tra solve problems. FM1 The course builds on and further develops linguistic competence acquired at secondary school. It revises, syste vious study. The following topics are covered: University studies in our country and in France, writing of transactional letters, CV, persor French culture and geography, Paris. Topics of specialization: mathematics, physics. Reading technical and popular science texts, we funct for Intermediate Students M2 on FM1. Linguistic structures and competence acquired in previous study are systemized and expanded. Reading popular science text on usage (passives, pominalization, word formation). Topics: physics, power engineering, environment. Internet	ZK CESZ1,2,3 course Z written and oral for ansmit general and emizes and expand nal statement, requ ork based on these Z ts, features typical nce and technologic	4 es and can 2 m. Students technical ds language uest, answer texts. 2 for technical or French
04XCESZZK The course conter 04XFM1 French - intermedia will be able to co information and to skills gained in prev to an advert, 04XFM2 Course FM2 builds and scientific lar	Czech for Foreigners Beginners - Examination ant is the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of the 04X only be taken after successful completion of all three courses. Detailed information is to be obtained from the teacher. French for Intermediate Students M1 ate FM The objective of this three-semester course is to improve and further develop communication in the French language in both v mmunicate in social interaction and in academic, scientific and professional environment. They will be able to use the language to tra solve problems. FM1 The course builds on and further develops linguistic competence acquired at secondary school. It revises, syste vious study. The following topics are covered: University studies in our country and in France, writing of transactional letters, CV, person French for Intermediate Students M2 on FM1. Linguistic structures and competence acquired in previous study are systemized and expanded. Reading popular science texts guage (passives, nominalization, word formation). Topics: physics, power engineering, environment, Internet, success of French scie scientists, artists and architects. Description of an object, device, shapes, dimensions, material.	ZK CESZ1,2,3 course Z written and oral for ansmit general and emizes and expand nal statement, requ ork based on these Z ts, features typical nce and technolog	4 es and can 2 m. Students technical ds language uest, answer e texts. 2 for technical y, French
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04XCESZZK The course contect 04XFM1 French - intermedia will be able to co- information and to skills gained in prev- to an advert, 04XFM2 Course FM2 builds and scientific lar 04XFM3 The course is focus participle structur field of students' fu- and one 04XFMZK The content is the 04XFP1 FP advanced cour be able to commun to solve problems. I passé composé-im request, answer to 04XFP2 With the link to P1	Czech for Foreigners Beginners - Examination Int is the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of the 04X only be taken after successful completion of all three courses. Detailed information is to be obtained from the teacher. French for Intermediate Students M1 ate FM The objective of this three-semester course is to improve and further develop communication in the French language in both v mmunicate in social interaction and in academic, scientific and professional environment. They will be able to use the language to tra solve problems. FM1 The course builds on and further develops linguistic competence acquired at secondary school. It revises, syst ious study. The following topics are covered: University studies in our country and in France, writing of transactional letters, CV, persor French for Intermediate Students M2 on FM1. Linguistic structures and competence acquired in previous study are systemized and expanded. Reading popular science text, guage (passives, nominalization, word formation). Topics: physics, power engineering, environment, Internet, success of French scie scientists, artists and architects. Description of an object, device, shapes, dimensions, material. French for Intermediate Students M3 sed on improvement and further development appare which will be delivered in form of an oral presentation in-cla ture specialisation or to their interest and generally covers a technical /applied science topic. It is not a translation but a creative work a's own knowledge/experienceLonger monologues on topics /situations set for the examination are prepared. Text structure, cohesi French for Intermediate Students P1 se The objective of this three-semester course is to improve and further develop communication in the French language in obt writt itate in social interaction and in academic, scientific and work environment. They will be able to use the language in obt writt itate in social interaction and in academic s	ZK CESZ1,2,3 course written and oral for unsmit general and emizes and expand- nal statement, requ ork based on these Z ts, features typical nce and technolog Z ordinate and infini ss. The paper is lir compiled from Fre on and coherence ZK f FM1-FM3. The ex- control form. S and technical info ated and expanded etters, CV, persona of specialization: m n. Z iven topics. Featur	4 es and can 2 m. Students technical ds language uest, answer e texts. 2 for technical gy, French 2 tive clauses, aked to the ench articles 4 xamination 2 tudents will rmation and d: subjonctif, l statement, nathematics, 2 es typical of
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04XFPZK	French for Advanced Students Examination	ZK	4
The whole French	h 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 ad	ccording to
	Examination Instructions, a document available on the web. Assessment of the presentation is included into the examination gr	ading.	
04XFZ1	French for Beginners Z1	Z	2
French for beginne	rs The objective of this 5-level course is to be able to communicate in French orally and in writing in situations of everyday life, in soc	ializing and in profe	essional life.
The course includ	les French for specific / technical communication and reading of popular science and scientific texts. FZ1 The objective is to be able to using the knowledge of changes alementary lenguage. The contexts is roughly sufficient by lenguage 1. Z of the toythool: Drouds.	o communicate at e	elementary
(Francouzčtina pro	using the knowledge of chosen elementary language. The contents is roughly outlined by lessons 1 - 7 of the textbook Pravda - Pravd	Jova, French for be	ginners
diving the	ize ky). It is extended with studentions of communication and functions from the textbook Espaces 1, tessons 1-4. Introductions, per directions, simple instructions and questions. Special attention is paid to pronunciation. Spelling is explained in connection with pronu	inciation and dram	, asking anu mar
	French for Beginners 72		2
The course is linki	ng up with F71. Elementary linguistic knowledge and communication skills are expanded. The scope is given by lessons 8 - 13 of the	<u> </u>	Pravdová ·
French for Begin	ners. Additional topics and skills are filled in from the textbook Espaces I. lesson 1 - 5 (introductions, invitation, welcoming, agreeme	ent - disagreement.	apology.
thanking, travelling	, map of France, food, expression of will, wish, order, prohibition, pleasure). Correct pronunciation is practiced. Stress on oral communi	cation. Specific top	ics covered:
	How does the machine work? A few expressions concerning the study. Name of University and Faculty.		
04XFZ3	French for Beginners Z3	Z	2
The course builts	upon FZ2. Basic linguistic knowledge and skills are developed. The contents is given by lessons 14 - 18 of the textbook: Pravda - Pravda	avdová: French for	Beginners.
Topics, functions	and situations are complemented from other materials. Stress is put on oral communication in dialogues and on reading, both for inf	ormation and loud	as part of
	pronunciation practice. Reading covers short adapted texts of general interest first, and later popular science texts.		
04XFZ4	French for Beginners Z4	Z	2
The course builds	up on FZ3. Basic linguistic knowledge and skills are further developed. Oral communication and reading skills are practiced. The con	ntents is roughly co	overed with
lessons 19 - 23 of t	he textbook French for Beginners, and is expanded with topics and functions from other materials. Reading is developed from the lectur	e notes French for I	Engineering
Students of FJFI.	The course covers generals and specific topics: health- illness, sport, free time, environment, study, travelling in France, Paris, shopp	ing, weather, unive	ersity in our
	country and in France, how to write CV, application, topics in mathematics, reading physics - mechanics, informatics, intern	et.	
04XFZ5	French for Beginners Z5	Z	2
All four skills acqui	red in FZ4 are further developed, as well as technical language. Students prepare a paper on a chosen popular science topic. They p	resent it orally in the	e class. The
general contents	is covered by lessons 24 - 26 of the textbook: Pravda-Pravdova, French for Beginners, and is complemented from other materials. Ic	pics: on physics fro	om lecture
notes, success	or French science and technology, information about France. Grammar is systemized and complemented with syntax (subordinate ci-	auses, typical conju	unctions,
	French for Beginnero Everningtion	71/	2
U4AFZZK	FIGUEN IOF DEGITION DEGITION EXAMINATION examination as given by the study plan. The course is terminated with an examination consisting of eral and written part. The examin	<u>∠</u> N	o documont
	Instruction for examination Its content covers the levels E71 - E75	alloff is fulled by the	
	Cormon for Intermediate Students M1	7	2
The objective of the	e course is to level off the students' skills in the German language. The course focuses on revision of more difficult phenomena and st	<u> </u>	assive) and
word formation	processes (e.g. importance of verb prefixes). In the lexical part, it covers topics referring to higher education in both the Czech Repu	ublic and Germany	current
environmental is	sues together with all necessary expressions and phrases, expressions and phrases needed to chemists, mathematicians, physicists	and the fundame	ntals of IT
	terminology. It develops communication on related topics and is aimed at correct pronunciation, grammatical correctness and unders	standability.	
04XNM2	German for Intermediate Students M2	Z	2
The course introdu	ces other more complex grammatical structures and their application in communication based on technical texts, such as the relation be	etween 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 systemati	cally revises other	grammatical
	phenomena important for professional discourse (participles, relative clauses).		
04XNM3	German for Intermediate Students M3	Z	2
The course introdu	ces other more complex grammatical structures and their application in communication based on technical texts, such as the relation be	etween 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 systematic	cally revises other (grammatical
	Cormon for Intermediate Studente Evamination	71/	4
	t is the evamination as given by the study plan. The whole German for Intermediate Students Course is completed by an evamination of	∠∩	4
and oral which co	the courses NM1 - NM3. The oral part follows after passing the written part successfully and after obtaining the 04NM3 assessm	ent More detailed	information
	is to be obtained from the teacher.		inioniation
04XNP1	German for Advanced Students P1	7	2
This course requi	res good grammar knowledge, extended general vocabulary, and good communication skills acquired at secondary school to be level	lled off at the begin	ning of the
course. The cours	se is then focused on working with technical and scientific texts and practising reading techniques (skimming, scanning, reading for d	etail). It revises and	d develops
more difficult gram	nar structures necessary for understanding a subtechnical text (passive voice, participles, participle structures) and it also focuses on pra	ctical everyday corr	munication,
_	i.e., telephoning.		
04XNP2	German for Advanced Students P2	Z	2
The course develop	bs the students' skills in working with professional scientific texts (understanding, summarising, note-taking, interpreting) while extending	their general and s	subtechnical
vocabulary range. I	t introduces mathematical expressions and texts of nuclear power engineering. Increasing emphasis is placed on understanding and pre-	actising formal com	munication,
b	oth written and oral (CV, letter of application, interview, scholarship), and more complex grammatical structures (i.e., subjunctive, indi	rect speech).	
04XNP3	German for Advanced Students P3	Z	2
The course consis	sts of 3 main parts (general communicative situations, grammar and technical topics). Students will develop their vocabulary in a variation	ety of less commor	n situations
(traffic problems a	nd car accidents, accident report, filling in a form, complaints). Based on presentations and technical and subtechnical texts, the voca	abulary range in fie	lds such as
nuclear power er	regineering, the environment, computer science, and car technology, will also be extended. Only authentic professional texts are used.	By means of a pre	esentation,
students are traine	d to process information gained from their reading of complex and difficult texts and present it to the class in a simplified oral form. The or	ourse also include:	s translation
		71/	
	German for Advanced Students Examination		4
and oral which	it is the examination as given by the study plan. The whole German for Advanced Students Course is completed by an examination of power the courses NP1 - NP3. The oral part follows after passing the written part successfully and after obtaining the O4NP2 upgrades	unsisting of two pa	e detailed
	information is to be obtained from the teacher	2 000000000000000000000000000000000000	
	Russian for Intermediate Studente M1	7	2
The course is desir	aned for students with previous knowledge of Russian from secondary schools. Students are supposed to know the Russian alphabet	<u>←</u> (both printed and b	andwritten)
basic vocabulary fo	procession of a supposed to know the Russian approach and a supposed to know the Russian approach of contraction in everyday situations (introductions, socializing, greetings, shopping for food and objects of everyday need, asking	the way and giving	directions)

they can use bas	sic grammar structures (verbal and nominal forms, irregular verbs, pronouns). The initial knowledge corresponds to the achievement	level of the RZ2 co	urse. The
	contents and scope of the course correspond approximately to the R23 course, but for half of the time allotted in the timetal		
04XRM2	Russian for intermediate Students MZ		2
	The course is based on the RMT course, its contents and scope conespond roughly to R24, however, for half of the time another in the		
	RUSSIAILIOLINEETITEOIALE SLUCETIS MS	∠ ∠	∠ time allotted
	in the timetable		
	Russian for Intermediate Students Examination	7K	1
The course conten	t is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowled	dae and skills acou	ired in RM1
- RM3. Stud	ents are eligible for the oral examination only after a prior pass in RM3 and a successful written examination. Students are given insi	ructions by the tea	cher.
04XRP1	Russian for Advanced Students P1	Z	2
The entrance req	uirement for the course is to achieve the B1 CEFR level. The objective of the course is revision of standard language structures, practice of the course is revision of standard language structures.	ticing more difficul	t grammar
	structures, understanding the fundamentals of technical language and training writing skills.		
04XRP2	Russian for Advanced Students P2	Z	2
The course is bas	ed on RP1. It expands grammatical structures important for understanding technical texts (verbal adjectives, participles, passives, ve	erb aspects, specifi	c syntactic
	structures). Stress is put on independent oral and written communication.		
04XRP3	Russian for Advanced Students P3	Z	2
The course is base	ed on RP2 and is mainly focused on working with technical and scientific texts (reading comprehension, oral and written paraphrasin	g, translation). The	RP1 - RP3
courses require go	od previous knowledge of general language at secondary level (listening, reading, correct communication in everyday situations). Th	e courses develop	and expand
these skills. Furthe	er study is aimed at professional and technical skills (reading technical literature according to the students specialization, oral and w	ritten interpretation). Students
develop their subte	conical vocabulary and practice quick and correct communication in professional situations. They will be able to both speak write acc	urately and with co	ntidence on
	Puesian for Advanced Students Examination	71	4
The course conten	t is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowled	∠n dae and skills acou	ired in RP1
- RP3. Stud	ents are eligible for the oral examination only after a prior pass in RP3 and a successful written examination. Students are given inst	ructions by the tead	cher.
04XR71	Russian for Beginners 71	7	2
The course represe	ents the first stage of the five-semester programme, its final aim being reading and understanding professional texts written in Russiar	n. Thus it begins wit	h mastering
the Russian alphab	bet (for both reading and writing skills) and fundamentals of grammar necessary for everyday communication (listening and speaking). Students will be	able to read
	a short text with marked stress, understand its contents and summarize it.		
04XRZ2	Russian for Beginners Z2	Z	2
The second semes	ter of the programme is designed to teach skills for basic communication in everyday situations and for reading easy and short subt	echnical texts. Stud	lents will be
able to communicat	te using short sentences and appropriate structures, and read aloud with confidence a short text without marked stress. They will als	o develop their voc	abulary and
	master further grammatical structures. They will have mastered with confidence the Russian alphabet and will be able to use it in	writing.	
04XRZ3	Russian for Beginners Z3	Z	2
The course is base	d on RZ2 and includes further everyday topics, develops understanding of short compact texts on new subtechnical topics (for training		a a disa ay a billa
	······································	y various forms of re	eading skills
and listening) and	d introduces new grammar. Students will be trained to distinguish intonation patterns while listening to spoken language. They will be	able to respond so	b as to be
and listening) and	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	b as to be
and listening) and 04XRZ4	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. Russian for Beginners Z4	able to respond so	a as to be
and listening) and 04XRZ4 The course is based words, oral comm	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. Russian for Beginners Z4 d on RZ3. It improves and expands the knowledge of general language in all four skills (reading and understanding longer texts with a cupication in everyday situations, writing longer texts). Students are trained to use grammar structures effectively (e.g., irregular verb	a ble to respond so Z certain percentage (ading skills b as to be 2 of unfamiliar
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047263	Spanish for Advanced Students P3	Z	2
Course SP3 is the	final part of the advanced Spanish course. It is based on texts chosen by the students according to their future specialization. It is focu	used on written con	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	admission to oral p	art is having
	passed the written test. Examination content is based on syllabi of courses SP1, SP2, and SP3 or on an individual study plan of th	e student.	
04XSZ1	Spanish for Beginners Z1	Z	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 fundamen	tal grammar structu	ures and will
be able to	communicate at an elementary level on topics of everyday life. They will acquire and extend fundamental vocabulary of general Spar	hish and will develo	p it.
04XSZ2	Spanish for Beginners Students Z2	Z	2
Course SZ2 is bas	ed 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 understan	d short adapted written texts and speech. Attention is also paid to cultural differences between Spanish-speaking countries and other	rs such as the Czeo	ch Republic.
	Realia of Spanish-speaking countries are also included.		
04XSZ3	Spanish for Beginners Z3	Z	2
The course is base	ed on course SZ2, and develops the student's vocabulary and grammar structure. The course covers realia (history and culture) of th	e Spanish-speakin	g countries,
mainly of Spain.	It pays attention to further grammar topics (pretérito perfecto, pretérito indefinido, pretérito imperfecto, the gerund and the imperative). It includes writter	n and oral
	communication on a given general topic, for which the student is trained by reading texts or listening to them.		
04XSZ4	Spanish for Beginners Z4	Z	2
The course is bas	sed on course SZ3. It develops the student's vocabulary and extends the knowledge of the culture and social customs of the Spanish	speaking countries	s, mainly of
Spain. It pays atte	ention to further grammar topics (perifrasis verbales, futuro imperfecto, direct object and indirect object pronouns, negative form of the	e imperative, and si	ubjunctive),
	to written and oral communication on a given general or subtechnical topic, for which the student is trained by reading texts or listeni	ing 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 for	or specific purpose	s. In its final
	part, the general Spanish course based on the course book will end with presentations and, finally, a written and oral examina	ation.	
04XSZZK	Spanish for Beginners Examination	ZK	3
The course cont	ent is the examination as given by the study plan. Examination consists of two parts - written and oral. Student can register for oral ex	amination only if h	ie/she has
	passed the written examination test.	-	
11ZFP	Basic to Solid State Physics	ZK	3
Description of fund	amental properties of solids following the regular long distance ordering of atoms in a crystal lattice. Based on the introduced bondin	g interaction betwe	en atoms in
solids, various type	es of crystals and their properties are defined. The model of crystalline lattice dynamics in harmonic approximation is described and basi	c ic thermal propertie	es 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 i	n solids by means	of electron
energy bands ex	xplained. The special consequences of band approach to the physical properties of solids are elucidated. The aim of the course is to	systematically intro	oduce and
	interpret a broad phenomenological basis of physical properties of crystalline solids		
11ZFPL	Basic to Solid State Physics	K7	2
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Description of fund	amental properties of solids following the regular long distance ordering of atoms in a crystal lattice. Based on the introduced bondin	g interaction betwe	en atoms in
solids, various type	amental properties of solids following the regular long distance ordering of atoms in a crystal lattice. Based on the introduced bondin as of crystals and their properties are defined. The model of crystalline lattice dynamics in harmonic approximation is described and basi	g interaction betwe	een atoms in es of crystals
solids, various type are derived. The	amental properties of solids following the regular long distance ordering of atoms in a crystal lattice. Based on the introduced bondin es 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 i	g interaction betwe ic thermal propertie n solids by means	een atoms in s of crystals of electron
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solids, various type are derived. The energy bands e: 12NME1	Adamental properties of solids following the regular long distance ordering of atoms in a crystal lattice. Based on the introduced bondin as of crystals and their properties are defined. The model of crystalline lattice dynamics in harmonic approximation is described and basis periodic potential of the crystal lattice is introduced and its relation to the following model describing the energetic state of electrons i xplained. The special consequences of band approach to the physical properties of solids are elucidated. The aim of the course is to interpret a broad phenomenological basis of physical properties of crystalline solids Numerical Methods 1	g interaction betwe ic thermal propertie n solids by means systematically intro	een atoms in es of crystals of electron oduce and
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tiltration, preparing the buffers and pH measurement and basic physico-chemical properties of the solutions determination). The tasks using basic ar spectrophotometry, chromatography or electrochemistry) are also tested.	alytical procedures	(titration,		
15ZRP Basic Laboratory Exercises in Radiochemistry	KZ	2		
This practical exercises are oriented on training of students in laboratory practice focusing on the manipulation with open sources within the working behin	d the shielding and i	n glovebox.		
Students are introduced into fundamental radiochemical techniques (dilution of radioactive solutions, extraction techniques, working with radionuclide generator). Students will gain practical knowledge in the field of decontamination (characterization of contamination, control smears and the methods of chemical decontamination).				
16BPV1 Bachelor Thesis 1	Z	5		
The bachelor project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the pro regular meetings and discussions.	ject supervisor durir	ng common		
16BPV2 Bachelor Thesis 2	Z	10		
The bachelor project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the pro	ject supervisor durir	ng common		
16DETE Detectors of Ionizing Radiation	ZK	4		
Gas filled detectors (ionization chambers, proportional counters, Geiger-Müller counters, corona counters), organic and inorganic scintillation detectors,	Cherenkov counters	, evaluation		
of light by photomultiplier, parameters of PMT, semiconductor detectors, cryogenic detectors.		-		
16EXKV Excursion	Z	2		
Excursion is focused on enhancing skills in the use of decontamination methods, work with legislation and waste management and it takes several day	s. Part of the excurs	sion will be		
a visit to one of the repositories in the Czech Republic (Richard). Decontamination techniques will be tested in a special hall in SUJCHBO v.v.i., Kamen of workplaces after the mining of radioactive minerals will be demonstrated in the TÚLL DIAMO s. Stráž pod Balskem There will also be demonstrated i	ná-Milín. The decom	missioning		
used to assess the remedial work, and their calibration. In cooperation with the SONS will be possible insight into the work of the emergency centers, ve	rification of internal	emergency		
plans, and the legislative framework for emergencies.		0,		
16PSE Topical Dosimetry Seminar	Z	2		
The seminary is supposed to motivate the students interest in the field of dosimetry and provide basic information about different applications of ionizing i	adiation in science,	in research		
and in human life. The lectures are given by students and absolvents of DDAIR, who are currently employed at the department or in various organization with the lectures will facus not only on describing research a second structure will facus not only on describing research as	ons (SURO, v.v.i., U	JF AV R		
dosimetry, but students will also learn more about Bachelor degree thesis topics and thus will learn more about their possible specialization during	the studies and afte	rwards.		
16RAON Radiation Protection	ZK	4		
The course covers the basic principles of radiation protection. It describes not only the current approaches but also points to future developments. The	course is accepted	as training,		
which allows obtaining special competence in radiation protection and learner receives appropriate certificate.				
16UJRF1 Introductory Nuclear and Radiation Physics 1	Z,ZK	4		
The aim of the course is to provide students with basic knowledge about atomic nucleus and radiation physics, which is followed by other specialized lease the atom and nucleus and radiation physics of the atom and nucleus hinding operative measures.	tures. The subject s	ummarizes		
of the nuclei, the most important nuclear models. General characteristics of the interaction of ionizing radiation with the matter, interaction of alpha, beta	gamma and neutro	n radiation.		
passage of radiation beams through the matter, radiation effects in matter.	gamma and noutro	in radiation,		
16UJRF2 Introductory Nuclear and Radiation Physics 2	Z,ZK	4		
The aim of the course is to provide students with basic knowledge about atomic nucleus and radiation physics, which is followed by other specialized lea	tures. The subject s	ummarizes		
thematic areas: general properties of radioactive decay, alpha decay, proton radioactivity, beta decay, gamma emission, natural radioactivity, properties	and types of nuclea	r reactions,		
16UV.IZ Introduction to Decommissioning of Nuclear Facilities	7.7K	4		
The course aims to familiarise students with the actual decommissioning process. The syllabus of the subject is built in the sense of the actual course of	the preparation and	realization		
of the decommissioning project. It includes implementation of site decommissioning including legislative requirements to protect employees and the environment of the decommission of the	ironment against ra	diation and		
waste management in their categorization, transport, release to the environment and disposal. It deals with documentation and centralization of	of monitoring system	ıs.		
16ZDOZ1 Fundamentals of Radiation Dosimetry 1	Z,ZK	4		
History, development, and objectives of dosimetry. Quantities and units used for description of sources, fields, interactions of ionizing radiation, ioniz absorption. Fundamentals of the effects of ionizing radiation.	ations, energy trans	ster and		
16ZEX Basic Experiments in the Field of Radiation Detection	KZ	2		
The aim of the course is to acquaint students with applications of ionizing radiation detectors and also with the principles of detection and spectrometr	y of ionizing radiatio	n. lonizing		
radiation detectors in this course is considered as a device which produces an evaluable signal at the time of interaction (unlike dosimeters). The aim o	the course is to un	derstand to		
basic principles of detection and calibration of common instruments in the field of ionizing radiation measurement.				
16ZIVB Introduction to Ecology	KZ	2		
indicators and sustainable development.		eeconomic		
16ZOZ Sources of Irradiation and Environment	KZ	4		
The subject provides an overview of the usage of ionizing radiation from its discovery and first applications to modern methods. It allows the student to	acquire the basic k	nowledge		
about ionizing radiation usage. The subject deals with the fundamental issues related to ionizing radiation and the safety of dealing with the sources of If	t. The course include	es practical		
exercises with processing the data and subsequent presentation of the results.				
16ZPSP Basic Work with the basic skills related to working on a personal computer. The introductory part of the course is devo	ted to information s	2 vetems and		
resources available at the CTU in Prague and the FNSPE. Emphasis is placed on effective handling of work with office productivity software (text editor	spreadsheet and p	resentation		
software) with exercises in MS Office. The practical content focuses mainly on further use during studies (laboratory reports, research work, bachelor	s and diploma these	es) and in		
specific practice (hospitals, state administration, companies). Other sections summarize basic information about computer hardware, software, and secu	rity. Completion of in	ndependent		
home exercises and participation in exercises above 60% is a necessary condition for passing the course.				
16ZKAU Basics of Radiation Protection	Z	2		
orientation in this field. The course provides answers to the cardinal questions: What is ionizing radiation (IR), where it comes from, whether and how it	is dangerous for ne	eople. what		
is the meaning of protective units (Gray, Sievert), how to prevent malicious effect of IR and many others. The content of the lectures does not require any prior knowledge.				
16ZRIZ Health risks of ionizing radiation	ZK	2		
The aim of the course is to acquaint students with the radiobiological basics of radiation protection. The basis of the course is an introduction to the biological basics of radiation protection.				
(ID) at the melegular collular and tissue levels, an everyion of deterministic and etcahastic offects of ionizing rediction, health harm, risk and its evaluation of the statement of the stateme	ical effects of ionizir	ig radiation		
	ical effects of ionizir ation, basics of epid	lemiology.		
17BPJZ Introduction to Nuclear Safety	ical effects of ionizir ation, basics of epid ZK	lemiology. 2		

17JARE	Nuclear Reactors	ZK	2			
Introduction. World power issue. Previous evolution of power reactor. Nuclear fission reactors, fuel assemblies, active core, control systems, safety systems, containment. Classification						
of reactors into IV generations. Standard types of nuclear power reactors: concept, description, layout, previous evolution, world share, perspectives. Pressurized water reactors (PWR).						
Western-type	Western-type PWR (Westinghouse, KWU, Framatom). VVER-type reactors, Temelín nuclear power plant. Boiling water reactors. Heavy water reactors, fast breeder reactors,					
high-temperature gas cooled reactors. Second nuclear era. reactors of generation III (EPR, AP-1000, VVER 1200). Reactors of generation IV: GIF and INPRO initiatives. Evaluation						
and	selection of proposed systems. Six selected concepts. ICRP scenarios of word evolution, hydrogen power, role of nuclear power in lo	ng-term outlook				
17TEK	Technical Drawing	KZ	3			
This subject represents short introduction into display methods, technical drawing in different fields and geography. The goal is to familiarize students with multidisciplinary fundamentals						
so they were ab	e to read and understand whatever drawing which describe nuclear facility (machine and its subsystems, control system, etc.), its bui	Iding and its equip	oment (air			
distribution system	cable distribution, etc.) including site. Part of the course is also familiarization with digital systems for storage of drawings and another as	sociated data and	information,			
with standardized formats and conversions between systems.						
18PMTL	Programming in MATLAB	KZ	4			
Introducing Matlab environment as efficient tool for computation in complex arrays and symbolic variables, namely for linear algebra, mathematic analysis, statistics, algorithmization						
and geometric representation of results.						
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.						
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 <u>http://bilakniha.cvut.cz/en/FF.html</u> Generated: day 2025-04-08, time 02:59.