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 skladani zkousky 01MANZ je ziskání 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, Josef Schmidt, Ji í Hrivnák, Goce Chadzitaskos, Jan Vysoký Jan Vysoký Josef Schmidt (Gar.)	Z,ZK	6	4+2	L	Р
01LAL	Linear Algebra 1 Petr Ambrož, Lubomíra Dvo áková Lubomíra Dvo áková Lubomíra Dvo áková (Gar.)	Z	2	2P+2C		Р
01LALZ	Linear Algebra 1, exam Petr Ambrož, Lubomíra Dvo áková Lubomíra Dvo áková Lubomíra Dvo áková (Gar.)	ZK	2	0P+0C		Р
01LAL2	Linear Algebra 2 Petr Ambrož, Lubomíra Dvo áková Lubomíra Dvo áková Lubomíra Dvo áková (Gar.)	Z,ZK	4	2P+2C		Р
01MAN	Calculus 1 Pavel Strachota, Miroslav Kolá, Edita Pelantová Pavel Strachota Pavel Strachota (Gar.)	Z	4	4+4		Р
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		Р
02MECH	Mechanics David B e Antonín Hoskovec David B e (Gar.)	Z	4	4+2	Z	Ρ
02MECHZ	Mechanics - Examination Iskender Yalcinkaya, Goce Chadzitaskos, Stanislav Skoupý, Petr Novotný, David B e , Filip Petrásek, Antonín Hoskovec 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 Ladislav Musílek (Gar.)	Z,ZK	4	2P+2C	L	Р

16ZOZ	Sources of Irradiation and Environment Ladislav Musilek, Ond ej Ko istka, Tomáš Urban, Tomáš echák, Václav	КZ	4	2P+2C	L	Р
	St pán, Lenka Thinová Václav St pán Václav St pán (Gar.)					
Characteristic	s of the courses of this group of Study Plan: Code=BSPVJZP1 Name	=BS P VJZF	PB 1st ve	ar		
02DEF1	History of Physics 1				7	2
	ce in the system of sciences. The relationship of man and nature. Natural sciences in ancient C	rientand Greece	, Greek nat	ural philosoph	ers, Aristo	otle. Physics in
	Archimed. Arabic science, European science in Middle Ages. Renaissance - da Vinci, Giordano					
as experimental sc	ience. 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	rics. Electric curi	ent and cire	1	,	s of the relativity
theory. Electrodyna	amic forces, magnetic field. Magnetic dipole, magnetics. Electromagnetic induction, RLC circuits	s. Electromagnet	ic waves, M	axwell equatio	ns.	
01LAL	Linear Algebra 1				Z	2
-	Linear dependence and independence. 3. Basis and dimension. 4. Subspaces of vector spaces	s. 5. Linear mapp	ings. 6. Mat	rices of linear	_	1
theorem.			-			
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. Herm		,	s. 5. Scalar
	jonality. 6. Metric geometry. 7. Riesz theorem and adjoint operator. Outline of the exercises: 1. N	-				
of determinants. 3.	Calculation of eigenvalues and eigenvectors. 4. Hermitian and quadratic forms. Canonical form	. 5. Scalar produ	ct and orthe	ogonality. Calc	ulation of	orthogonal
complements. 6. G	eometry exercises and examples. 7. Adjoint operators.					
01MAN	Calculus 1				Z	4
Basic calculus (rea	al analysis, functions of one real variable, differential calculus).			I I		I
01MANZ	Calculus 1, exam				ZK	4
01MAN2	Calculus 2			Z	,ZK	8
1. Continuation of o	differential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of converge	nce, operations of	on series, al		•	convergence 3.
Real and complex	power series, the Cauchy-Hadamard theorem, expansion of function into power series, summat	ion of infinite ser	ies. 4. Theo	ry of integrals:	primitives	, definite integral
(Riemann definitior	n), techniques of integration and application of integrals, Generalized Riemann integral					
02MECH	Mechanics				Z	4
Introduction to physical	sics, physical quantities and units. Kinematics of a particle, basic types of motion and their supe	erposition. Dynai	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 system	stem of particles	two-body p	problems, parti	cle collisi	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.			I I		I
15OCH	General Chemistry			Z	,ZK	6
	classification of substances, concentrations, chemical reactions and equations, stoichiometric	calculations, ato	ms and mo			-
• •	ermodynamics, first law of thermodynamics, thermochemistry, second law of thermodynamics, e					
pH, reaction kinetic	cs, kinetic equation, Arrhenius' equation.	-				
00PT	Preparatory Week				Z	2
16UJRF1	Introductory Nuclear and Radiation Physics 1			7	,ZK	4
The sim of the sou	in the provide students with basis knowledge shout stemis pusieus and rediction physics, wh	ich is falloursd hu	otherenee	iolized leatured	,	ioot our monime

The aim of the course is to provide students with basic knowledge about atomic nucleus and radiation physics, which is followed by other specialized lectures. The subject summarizes 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

	absolvovanini predmetu 15001.					
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	Ρ
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	Ρ
01ANB3	Calculus B 3 Miroslav Kolá, Milan Krbálek Milan Krbálek Miroslav Kolá (Gar.)	Z,ZK	8	4P+4C		Ρ
01ANB4	Calculus B 4 Ji í Mikyška, Miroslav Kolá Ji í Mikyška Milan Krbálek (Gar.)	Z,ZK	6	2P+4C		Ρ

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 (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 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	Ρ
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 ye	ar		
16DETE Det	tectors of Ionizing Radiation		-		ZK	4
	n chambers, proportional counters, Geiger-Müller counters, corona counters), organic a	and inorganic scir	ntillation det	ectors, Cher	enkov counte	rs, evaluation
	rameters of PMT, semiconductor detectors, cryogenic detectors. ysical Chemistry 1			7	"ZK	5
1	ed to the recapitulation of the thermodynamic systems and thermodynamic properties o	f ideal and real o	ases. Next o		· .	-
	nics and their applications. Last but not least, attention is devoted also to the thermodyn	-		-		
of nonequilibrium thermodyna	amics.					
	clear Reactors			1	ZK	2
	ue. Previous evolution of power reactor. Nuclear fission reactors, fuel assemblies, active	-				
, v	s. Standard types of nuclear power reactors: concept, description, layout, previous evolution house, KWU, Framatom). VVER-type reactors, Temelín nuclear power plant. Boiling with the standard stand Standard standard st Standard standard st Standard standard st Standard standard standard standard standard standard standard st Standard standard standard standard standard st Standard standard standard standard standard st Standard standard standard st Standard standard st Standard standard st Standard st St Standard st St St St St St St St St St St St St St					. ,
	reactors. Second nuclear era. reactors of generation III (EPR, AP-1000, VVER 1200).					
	stems. Six selected concepts. ICRP scenarios of word evolution, hydrogen power, role	-				
01ANB3 Cal	Iculus B 3			Z	"ZK	8
	series - convergence range, criteria of uniform convergence, continuity, limit, differenti	-				
	. 2. Ordinary differential equations - equations of first order (method of integration factor		-			-
	and equations of higher order (fundamental system, reduction of order, variation of para on). 3. Metric spaces - metric, norm, scalar product, neighborhood, interior and exterio	-			-	-
	e, Hilbert spaces. Orthogonal polynomials. Complete orthogonal systems. 4. Fourier seri				•	
	. 5. Differential calculus of functions of several variables - limit, continuity, partial and d	-			-	
Taylor series, elementary terr	ms of vector analysis, Jacobi matrix. 6. Functions defined implicitly by one or several e	quations.				
	Iculus B 4			1	"ZK	6
	více prom nných a funkcionálních vektor . [2] Funkce zadané implicitn . [3] Taylorovy ustavy sou adnic. [5] Lokální, vázané a globální extrémy funkce více prom nných. [6] .					
	oustavy sou adnic. [5] Lokaini, vazane a giobalni extremy funkce vice promi nnych. [6]. promi nných - Riemanni v a Lebesgue iv integrál, základní vlastnosti, Fubiniova v ta, v	-				
	imetru. [8] Integrály po k ivkách a plochách. Integrální v ty.			booguooru	ta. Einita, o	sojnoor u
12NME1 Nu	merical Methods 1			Z	"ZK	4
	c principles of numerical mathematics important for numerical solving of problems impo			0,		
	nary differential equations, random numbers) are included in addition to the basic num	erical methods. Ir	ntegrated co	omputational	environment	MATLAB is
	ning language as a demonstration tool. The seminars are held in computer laboratory.				V 7	
1 1	poratory Exercises in General Chemistry asic laboratory techniques in chemical lab. At the beginning, the health and safety trair	ing in chemical/r	adiochemic		KZ	3 Iling of basic
	cal scales, automatic pipettes, etc.) are required. During individual work students get the	-				-
filtration, preparing the buffer	s and pH measurement and basic physico-chemical properties of the solutions determ	nination). The tasl	ks using ba	sic analytical	procedures (titration,
	ography or electrochemistry) are also tested.					
	chnical Drawing				KZ	3
	introduction into display methods, technical drawing in different fields and geography. T d understand whatever drawing which describe nuclear facility (machine and its subsy	-				
	ribution, etc.) including site. Part of the course is also familiarization with digital systems i	-		-		
with standardized formats an	d conversions between systems.	-	-			
16UJRF2 Intr	oductory Nuclear and Radiation Physics 2			Z	"ZK	4
	rovide students with basic knowledge about atomic nucleus and radiation physics, which	-	-		-	
	erties of radioactive decay, alpha decay, proton radioactivity, beta decay, gamma emiss elements, thermonuclear reaction.	son, natural radio	activity, pro	pernes and		ai reactions,
	sic Experiments in the Field of Radiation Detection				KZ	2
	cquaint students with applications of ionizing radiation detectors and also with the prin	ciples of detectio	n and spec			_
	urse is considered as a device which produces an evaluable signal at the time of intera	ction (unlike dosi	meters). Th	e aim of the	course is to u	nderstand to
	and calibration of common instruments in the field of ionizing radiation measurement.				71/	
	ndamentals of Radiation Dosimetry 1 vjectives of dosimetry. Quantities and units used for description of sources, fields, intera	actions of ionizing	radiation		.,ZK energy transfe	4 er and
	the effects of ionizing radiation.					
	sics of Programming				Z	4
	ly for students with little or no experience in programming. It familiarizes the students v	vith the basic cor	cepts in pro	ogramming a	ind with the P	ython
programming language.						

ode of the grou	n: BSPV/ IZP3					
	ip: BS P_VJZPB 3rd year					
•	dits in the group:					
	irses in the group. In this group you have to comple	to ot loool	+ 12 00	uraaa		
edits in the gro		ele al leas		11565		
•	•	věcch zkouč	ak z Ma	tomatick	á analúzy (a Linoá
ote on the grou	algebry. Zápis 15JCHDC podmíněn absolvováním pře					
	podmíněn absolvováním předmětů 15POBCH a 16ZE					
	16RAON navazuje na předměty 16ZRIZ, 16UJRF12,		bom pro			rounn
	Name of the course / Name of the group of courses					
ode	(in case of groups of courses the list of codes of their members)	Completion	Credits	Scope	Semester	Role
	Tutors, authors and guarantors (gar.)					
BPV1	Bachelor Thesis 1 Lenka Frýbortová (Gar.)	Z	5	0+5	*	Р
BPV2	Bachelor Thesis 2 Lenka Frýbortová (Gar.)	Z	10	0+10	*	Р
BEXKV	Excursion Lenka Thinová Lenka Thinová (Gar.)	Z	2	1XT	L	Р
5JCHDC	Nuclear Chemistry for DC Xenie Lytvynenko, Jan John, Václav uba Václav uba Jan John (Gar.)	Z,ZK	4	2P+2C	Z	Р
INME2	Numerical Methods 2 Michal Beneš Michal Beneš (Gar.)	KZ	2	2+0	L	Ρ
IPRST	Probability and Statistics Tomáš Hobza Tomáš Hobza Tomáš Hobza (Gar.)	Z,ZK	4	3+1	Z	Р
BRAON	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	Р
IRMAF	Equations of Mathematical Physics Václav Klika Václav Klika (Gar.)	Z,ZK	7	4P+2C		Р
1TEM	Engineering Mechanics Ji í Kunz Ji í Kunz Ji í Kunz (Gar.)	Z,ZK	6	4	5	Р
'BPJZ	Introduction to Nuclear Safety Lenka Frýbortová, ubomír Sklenka Lenka Frýbortová Lenka Frýbortová (Gar.)	ZK	2	2+0	L	Р
BUVJZ	Introduction to Decommissioning of Nuclear Facilities Lenka Thinová, Tomáš Trojek Lenka Thinová Lenka Thinová (Gar.)	Z,ZK	4	3P+1C	L	Р
SZRP	Basic Laboratory Exercises in Radiochemistry Kate ina ubová, Miroslava Semelová Miroslava Semelová Kate ina ubová (Gar.)	ΚZ	2	2L	Z	Р
aracteristics of the	courses of this group of Study Plan: Code=BSPVJZP3 Name=	BS P_VJZPE	3 3rd yea	r		
	chelor Thesis 1		-		Z	5
e bachelor project is base	d on a topic approved by the administrators of the programme, department and by the d	ean. The student	is guided by	the project	supervisor dur	ing comm
aracteristics of the	Basic Laboratory Exercises in Radiochemistry Kate ina ubová, Miroslava Semelová Miroslava Semelová Kate ina ubová (Gar.) courses of this group of Study Plan: Code=BSPVJZP3 Name= chelor Thesis 1	BS P_VJZPE	3 3rd yea	 r	Z	

Excursion is focus	ed on enhancing skills in the use of decontamination methods, work with legislation and waste management and it takes several of	days. Part of the exc	cursion will be
a visit to one of th	e repositories in the Czech Republic (Richard). Decontamination techniques will be tested in a special hall in SÚJCHBO v.v.i., Karr	nenná-Milín. The de	commissioning
of workplaces after	r the mining of radioactive minerals will be demonstrated in the TÚU, DIAMO s., Stráž pod Ralskem. There will also be demonstrate	ed in situ measurem	ent techniques
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,	, verification of inter	nal emergency
plans, and the leg	slative framework for emergencies.		
15JCHDC	Nuclear Chemistry for DC	Z,ZK	4
The following topi	s are discussed in detail in the course: Nuclear reactions yield, reaction cross section. Fission reaction, spontaneous fission. Chen	nistry of atoms form	ed in a nuclea
reaction, local ten	perature, 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 deve	ted to numerical solution of boundary-value problems and intial-boundary-value problems for ordinary and partial differential equation	ons. It explains meth	ods converting
boundary-value p	oblems to initial-value problems and finite-difference methods for elliptic, parabolic and first-order hyperbolic partial differential equ	uations.	
01PRST	Probability and Statistics	Z,ZK	4
It is a basic cours	of probability theory and mathematical statistics. The probability theory is build gradually beginning with the classical definition a	nd continuing till the	e Kolmogorov

definition. The notions a	s random variable, distribution function of random variable and characteristics of random variable are treated and basic limit	theorems are stat	ted 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 l	pasic principles of radiation protection. It describes not only the current approaches but also points to future developments. T	he course is acce	pted as training.					

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
	Introduction to Decommissioning of Nuclear Facilities iliarise students with the actual decommissioning process. The syllabus of the subject is built in the sense of the actual course	I ' I	-
The course aims to fami		of the preparatio	n and realization
The course aims to fami of the decommissioning	liarise students with the actual decommissioning process. The syllabus of the subject is built in the sense of the actual course	of the preparation	n and realization
The course aims to fami of the decommissioning	liarise students with the actual decommissioning process. The syllabus of the subject is built in the sense of the actual course project. It includes implementation of site decommissioning including legislative requirements to protect employees and the	of the preparation	n and realization
The course aims to fami of the decommissioning waste management in the 15ZRP	liarise students with the actual decommissioning process. The syllabus of the subject is built in the sense of the actual course project. It includes implementation of site decommissioning including legislative requirements to protect employees and the heir categorization, transport, release to the environment and disposal. It deals with documentation and centralization of mor	of the preparation environment again hitoring systems. KZ	n and realization nst radiation and 2
The course aims to fami of the decommissioning waste management in the 15ZRP This practical exercises	liarise students with the actual decommissioning process. The syllabus of the subject is built in the sense of the actual course project. It includes implementation of site decommissioning including legislative requirements to protect employees and the heir categorization, transport, release to the environment and disposal. It deals with documentation and centralization of mor Basic Laboratory Exercises in Radiochemistry	e of the preparation environment again hitoring systems. KZ hind the shielding	n and realization nst radiation and 2 and in glovebox.
The course aims to fami of the decommissioning waste management in the 15ZRP This practical exercises Students are introduced	liarise students with the actual decommissioning process. The syllabus of the subject is built in the sense of the actual course project. It includes implementation of site decommissioning including legislative requirements to protect employees and the heir categorization, transport, release to the environment and disposal. It deals with documentation and centralization of mor Basic Laboratory Exercises in Radiochemistry are oriented on training of students in laboratory practice focusing on the manipulation with open sources within the working be	o of the preparation environment again hitoring systems. KZ hind the shielding e generator). Stud	n and realization nst radiation and 2 and in glovebox.

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 Jakub Hají ek (Gar.)	Z	1	0+2	L	PV
00RET	Rhetoric Jana Ková ová Jana Ková ová Beatriz Vadillo Gonzalo (Gar.)	Z	1	0+2		PV
00UPRA	Introduction to Law Martin ech Jana Ková ová Martin ech (Gar.)	Z	1	0+2		PV
00UPSY	Introduction to Psychology Jakub Hají ek Jana Ková ová Jakub Hají ek (Gar.)	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 introduc	es the basics of micro- and macroeconomics.		•
00ETV	Ethics of Science and Technology	Z	1
00RET	Rhetoric	Z	1
The course is focus	ed on the acquisition of speech and voice techniques and on the rules of correct pronounciation. The course is also devoted to the	ne composition of	public speech
as well as to its non	verbal aspects. Stylistics exercises, strategies for coping with stage-fright and a short excursion into the history of rhetoric are an	n integral part of t	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 Jana Ková ová (Gar.)	ZK	4		Z	PV
04XAPZK	English for Advanced Students Examination Slav na Brownová, Darren Copeland Jana Ková ová Darren Copeland (Gar.)	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
	he examination as given by the study plan. The examination covers the AM1, AM2, and AM3 courses and consists of two par		nin) and oral
	it is expected to master the AM syllabus and demonstrate the ability to apply their knowledge gained in the three English cou		
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 kno	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 course	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	ne 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	rt 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	niation 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	y 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 the	e examination as given by the study plan. The whole German for Intermediate Students Course is completed by an examinati	on consisting of tv	o 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	ed 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	vledge and skills a	cquired in RM1
- RM3. Students are elig	gible for the oral examination only after a prior pass in RM3 and a successful written examination. Students are given instruct	tions by the teach	er.
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	, vledge and skills a	cquired in RP1
- RP3. Students are elig	ible for the oral examination only after a prior pass in RP3 and a successful written examination. Students are given instructi	ons by the teache	r.
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	, vledge and skills a	cquired in RZ1
- RZ5. Students are elig	ible for the oral examination only after a prior pass in RZ5 and a successful written examination. Students are given instruction	ons by the teache	r.

	anish for Intermediate Students Examination amination as given by the study plan. SMZK examination consists of two parts - written a	and oral; to be elio	ible for the v	vritten part,	ZK students will ha	4 ve obtained
non-graded assessment for	course SM3.Oral examination follows the written part.	,				
	anish for Advanced Students Examination amination as given by the study plan. Examination SPZK consists of two parts, namely	oral and written 1	The prerequi	1	ZK	4 art is having
	mination content is based on syllabi of courses SP1, SP2, and SP3 or on an individual					artis naving
	anish for Beginners Examination	aral Student con	register for a	1	ZK	3
passed the written examinat	amination as given by the study plan. Examination consists of two parts - written and o ion test.	oral. Student can	register for a	orai examina	ation only if ne/s	sne nas
	k: Elective courses					
	of credits of the block: 0					
The role of the bl	UCK. V					
Code of the grou	D: BSPVJZPV					
•	ip: BS P_VJZPB Optional courses					
Requirement cree	dits in the group:					
Requirement cou	rses in the group:					
Credits in the gro	up: 0					
Note on the grou						
_	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their					
Code	members)	Completion	Credits	Scope	Semester	Role
	Tutors, authors and guarantors (gar.) History of Physics 2	_				
02DEF2	Igor Jex Igor Jex (Gar.)	Z	2	2+0	L	V
14FKO	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 Hana Pr šová (Gar.)	KZ	2	2+0	Z	V
01UP1	Introduction to Probability 1 Jan Vybíral Jan Vybíral Jan Vybíral (Gar.)	Z,ZK	3	1P+1C		V
01UP2	Introduction to Probability 2 Milan Krbálek, 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	Foundations of Physical Measurements 2 Petr Chaloupka Petr Chaloupka (Gar.)	КZ	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
		1	1			
16ZPSP	Basic Work with PC Kamil Augsten Kamil Augsten (Gar.)	Z	2	0+2	1	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
	al mechanics after Newton, Bernoulli's, Euler, Lagrange. Historical development of optics, corpuscular and wave approach. E		
-	n, electrodynamics and electromagnetism, Faraday and Maxwell. Thermodynamics and its laws, statistical physics, Boltzman		-
	Planck and Einstein. Discovery of radioaktivity, structure of atom, atomic nucleus, Rutherford and Bohr. The way to nuclear e ncept of Nature and Universe of today.	nergy, Elementary	y particles,
14FKO	Metal Physics	Z,ZK	6
	ackground of processes encountered in production and thermo-mechanical treatment of metallic materials is described, inclu		-
	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 student's communication skills acquired throughout their previous studies. It aims to improve all aspects of oral commun		-
-	ous communication situations and will master their communication strategy. They will also practise their listening skills in orde tent will be trained to express their ideas clearly and according to current English usage, and become a more confident spea		and participate
00MAM1	Essentials of High School Course 1	Z	1
	to mathematical concepts and methods used in the introductory physics course.	2	1
00MAM2	Essentials of High School Math Course 2	Z	1
Review of basics of high	U		
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
	ectures are given by students and absolvents of DDAIR, who are currently employed at the department or in various organization		
	pspital Na Homolce, FN v Motole, PTC Czech s.r.o., CERN, Fermilab). The lectures will focus not only on describing research	-	
-	will also learn more about Bachelor degree thesis topics and thus will learn more about their possible specialization during the processing of the specialization during the special s		
18PMTL	Programming in MATLAB ronment as efficient tool for computation in complex arrays and symbolic variables, namely for linear algebra, mathematic an	KZ	4
and geometric represer		alysis, statistics, a	algonumization
01PSL	LaTeX - Publication Instrument	Z	2
	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
	It basic of the ecologic principles, terms and ideas. It covers overview information regarding to particular components of the er	1 1	aluate economic
indicators and sustainal	ble development.		
01UP1	Introduction to Probability 1	Z,ZK	3
	e set of possible results, classical probability, independent random events 2. Probability and combinatorics 3. Probability and g	• •	
	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
01UP2	ue 7.Probabilistic method in graph theory 8.Random algorithms, Morris algorithm and its variants Introduction to Probability 2	Z,ZK	3
	tinuous random variable and its statistical description. 2. Distribution function and probability density. 3. Axiomatic introductio		
	erical characteristics of continuous random variables. 5. Selected variants of continuous distributions and their characteristics		
estimations. 7. Generati	ing pseudorandom numbers from the selected distribution.	-	
12ZEL1	Basic Electronics 1	Z,ZK	3
	mary knowledge of circuit theory concerning principles of electronic circuits in both stationary and harmonic stable state. Cir		
	c and complex method are explained. Proper circuit analysis is also lectured. The subject's final part deals with transient effect		
12ZEL2	Basic Electronics 2	Z,ZK	3
	with the Basic Electronics 1. Semiconductor elements basic properties are explained. Thecourse's final part deals with basic	-	
02ZM1	Foundations of Physical Measurements 1 for students of physical specializations (Experimental particle physics, Physical engineering, Nuclear engineering), however,	it can be attende	2
-	al of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired d		-
basic habits of work in a			
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,	1	d by students of
-	al of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired d	ata on a PC. Stud	dents learn the
basic habits of work in a			-
11ZFP	Basic to Solid State Physics	ZK	3
	ntal properties of solids following the regular long distance ordering of atoms in a crystal lattice. Based on the introduced bon crystals and their properties are defined. The model of crystalline lattice dynamics in harmonic approximation is described and b	-	
	ic potential of the crystal lattice is introduced and its relation to the following model describing the energetic state of electrons		-
	I. The special consequences of band approach to the physical properties of solids are elucidated. The aim of the course is to	-	
	menological basis of physical properties of crystalline solids		
11ZFPL	Basic to Solid State Physics	KZ	2
	ntal properties of solids following the regular long distance ordering of atoms in a crystal lattice. Based on the introduced bon	-	
	crystals and their properties are defined. The model of crystalline lattice dynamics in harmonic approximation is described and b		
	ic potential of the crystal lattice is introduced and its relation to the following model describing the energetic state of electrons d. The special consequences of band approach to the physical properties of solids are elucidated. The aim of the course is to	-	
	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	evoted to information	tion systems and
resources available at the CTU in Prague and the FNSPE. Emphasis is placed on effective handling of work with office productivity software (text e	litor, spreadsheet	and presentatior
software) with exercises in MS Office. The practical content focuses mainly on further use during studies (laboratory reports, research work, bache	or's and diploma t	heses) and in
specific practice (hospitals, state administration, companies). Other sections summarize basic information about computer hardware, software, and	ecurity. 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 Jana Ková ová (Gar.)	Z	2	0+2	Z	V
04XAM2	English for Intermediate Students M2 Jana Ková ová Jana Ková ová (Gar.)	Z	2	0+2	L	V
04XAM3	English for Intermediate Students M3 Jana Ková ová Jana Ková ová (Gar.)	Z	2	0+2	Z	V
04XAP1	English for Advanced Students P1 Jana Ková ová Darren Copeland (Gar.)	Z	2	0+2	Z	V
04XAP2	English for Advanced Students P2 Darren Copeland Darren Copeland (Gar.)	Z	2	0+2	L	V
04XAP3	English for Advanced Students P3 Jana Ková ová Darren Copeland (Gar.)	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	Z	2	0+4	L	V
04XRZ2	Zhanna Isaeva Žhanna Isaeva (Gar.) Russian for Beginners Z2 Zhanna Isaeva Zhanna Isaeva (Gar.)	Z	2	0+4	Z	V
04XRZ3	Russian for Beginners Z3	Z	2	0+4	L	V
 04XRZ4	Zhanna Isaeva Žhanna Isaeva (Gar.) Russian for Beginners Z4	Z	2	0+4	Z	v
04XRZ5	Zhanna Isaeva Žhanna Isaeva (Gar.) Russian for Beginners Z5	Z	2	0+4	L	v
04XSM1	Zhanna Isaeva Zhanna Isaeva (Gar.) Spanish for Intermediate Students M1	Z	2	0+2	Z	v
04XSM2	Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.) Spanish for Intermediate Students M3	Z	2	0+2	L	V
04XSM3	Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.) Spanish for Intermediate Students M3	Z	2	0+2	Z	v
04XSP1	Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.) Spanish for Advanced Students P1	Z	2	0+2	Z	v
04XSP2	Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.) Spanish for Advanced Students P2	Z	2	0+2	L	v
04XSP3	Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.) Spanish for Advanced Students P3	Z	2	0+2	Z	v
04XSZ1	Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.) Spanish for Beginners Z1	Z	2	0+4	L	v
04XSZ2	Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.) Spanish for Beginners Students Z2	Z	2	0+4	Z	v
04XSZ3	Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.) Spanish for Beginners Z3	Z	2	0+4	L	v v
04XSZ4	Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.) Spanish for Beginners Z4	Z	2	0+4	Z	v v
04XSZ5	Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.) Spanish for Beginners Z5	Z	2	0+4		
	Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)	۷.	2	074	L	V
Characteristics of the	e courses of this group of Study Plan: Code=BSPJAZYKY2	ZAP Name=BS P	azyky za	p		
	nglish for Intermediate Students M1				Z	2
	students who have successfully completed the full secondary school English lang					
	s (CEFR). It provides an introduction into English for Specific and Academic Purp n communication situations. Thus it covers topics related to the student's life and					
•	f grammar issues used in EAP.	noeus as well as lupics		ncai interest		מוסט אמוט נט
	nglish for Intermediate Students M2				Z	2
	e student to have completed the AM1 course. It develops their skills for work with	h subtechnical texts. foc	using also n	l nore on spec		
	ESP and EAP (e.g., definition, existence and classification of phenomena, object do		•	•		
revision is included.		, ,		0	0	,, , , , , , , , , , , , , , , , , , , ,
	nglish for Intermediate Students M3				Z	2
	ills that enable students to cope with features typical of professional style. Increasi	ng attention is paid to de	veloping sul	otechnical vo		_
understanding of profession	nal texts. Great emphasis is placed on distinguishing different levels of formal and	d informal oral and writte	en communi	cation and th	neir appropria	te Czech
equivalents. The course also	o includes studying abstracts and rules for writing them as well as basic rules for	preparing and giving a	short prese	ntation on a	chosen topic	related 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 t	ne Common Europ	
of Reference for Languages - CEFR). It provides an introduction into English for Specific and Academic Purposes (ESP, EAP), i.e., into the fundam	-	
grammar, and style typical of professional oral and written communication situations (fundamentals of terms in mathematics and physics, definition	s, 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 writi	ng (writing a CV, lett	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 chose	n 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 rhe	orical 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 linguis	tically 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 format	I writing including the	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 tex	. It includes training	oral and written
communication skills and functions (e.g., expressing an opinion, agreement, and objections; taking part in discussion, note-taking; summarizing, w	riting 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 informal la	inguage 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 (phonetic a	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 communic	ation 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	d 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.	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
04XCESZ3 Czech for Foreigners - Beginners 3	Z	2
The course further develops the language and communication competences acquired in the XCESZ1 and XCESZ2 courses. The teaching focuses	1 1	
fixing correct pronunciation and deepening grammar, features through practice, as well as introducing the Czech culture. Students are asked to pro		
frequent types of dialogue. They also practise understanding texts in terms of main ideas or looking for specific details in texts. The course covers ro		
	aginy locoone e 7 n	
04XCESM1 Czech for Foreigners - Intermediate 1	7	2
04XCESM1 Czech for Foreigners - Intermediate 1 The course is focused on correct pronunciation, important morphological phenomena, prepositional phrases, and verb forms as well as on extending		
	the student s vocat	bulary for various
social situations.	7	0
04XCESM2 Czech for Foreigners - Intermediate 2	Z	2
The course develops the topics covered in CESM1 and is then focused on more difficult grammar phenomena. It practices writing, speaking, and re-	ading skills and tra	ains the student
in understanding common abbreviations, abbreviated words, and mathematical terms and formulas.		
04XCESM3 Czech for Foreigners - Intermediate 3	Z	2
The last course revises morphological topics covered earlier and extends the student's knowledge of more difficult language phenomena. It is espectively a student is the student of the s	ecially 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 Common	•	
It is focused partly on revision of standard language structures, but mainly on practising more complex grammatical structures typical of the style of		
basics of functional style of engineering and professional communication, both in spoken and written form. The topics include University Studies and	d 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 technical	and specialist texts	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 presenta	tion, 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 the	1	
will be able to communicate in social interaction and in academic, scientific and professional environment. They will be able to use the language to		
information and to solve problems. FM1 The course builds on and further develops linguistic competence acquired at secondary school. It revises,	e	
skills gained in previous study. The following topics are covered: University studies in our country and in France, writing of transactional letters, CV, p	-	
to an advert, French culture and geography, Paris. Topics of specialization: mathematics, physics. Reading technical and popular science texts, wo		-
04XFM2 French for Intermediate Students M2	Z	2
Course FM2 builds on FM1. Linguistic structures and competence acquired in previous study are systemized and expanded. Reading popular science	1	
and scientific language (passives, nominalization, word formation). Topics: physics, power engineering, environment, Internet, success of French si		
scientists, artists and architects. Description of an object, device, shapes, dimensions, material.		3,,
04XFM3 French for Intermediate Students M3	Z	2
The course is focused on improvement and further development of linguistic competence acquired during the follow-up courses. Syntactic structures		
participle structures, compound tenses). Text summaryStudents prepare a written paper which will be delivered in form of an oral presentation in-		
field of students' future specialisation or to their interest and generally covers a technical /applied science topic. It is not a translation but a creative		
and one's own knowledge/experienceLonger monologues on topics /situations set for the examination are prepared. Text structure, cohesion and	-	
04XFP1 French for Advanced Students P1	Z	2
FP advanced course The objective of this three-semester course is to improve and further develop communication in the French language in both	1	
be able to communicate in social interaction and in academic, scientific and work environment. They will be able to use the language to transmit ge		
to solve problems. FP1 The course builds on and further develops linguistic competence acquired at secondary school. Difficult grammar topics are		
passé composé-imparfait, pronouns. The following specific topics are covered: University studies in our country and in France, writing of transactio	· ·	•
request, answer to an advert, environmental issues, success of French science and technology, chosen topics from French regional culture, Paris. To	-	
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 or	_	_
technical and scientific communication are stressed (passive voice, nominalization, word formation).	in giron topicon e	ata oo typical of
04XFP3 French for Advanded Students P3	Z	2
	_	1
The course is focused on systemization and improvement of acquired linguistic competence, skills and knowledge, and their use for communication in skill - translation of shorter texts (both from and into the language). Writing of a paper and making oral presentation in-class. The paper generally co		
topic. It is a creative work compiled from 3 French sources. Preparation of several set topics for oral examination.		applied science
	_	
04XFZ1 French for Beginners Z1	Z	2
French for beginners The objective of this 5-level course is to be able to communicate in French orally and in writing in situations of everyday life , in	-	
The course includes French for specific / technical communication and reading of popular science and scientific texts. FZ1 The objective is to be able		
level, actively using the knowledge of chosen elementary language. The contents is roughly outlined by lessons 1 - 7 of the textbook Pravda - Pravd		-
(Francouzština pro za áte ky). It is extended with situations of communication and functions from the textbook Espaces I, lessons 1-4 : introductions		
giving the directions, simple instructions and questions. Special attention is paid to pronunciation. Spelling is explained in connection with pronuncial	tion and grammar	
04XFZ2 French for Beginners Z2	Z	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 - disagreeme	nt, apology,
thanking, travelling, map of France, food, expression of will, wish, order, prohibition, pleasure). Correct pronunciation is practiced. Stress on oral comm	unication. Specifi	c topics covered:
How does the machine work? A few expressions concerning the study. Name of University and Faculty.		
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	_	
Topics, functions and situations are complemented from other materials. Stress is put on oral communication in dialogues and on reading, both for ir		° I
pronunciation practice. Reading covers short adapted texts of general interest first, and later popular science texts.		
	7	2
04XFZ4 French for Beginners Z4	Z	. – .
The course builds up on FZ3. Basic linguistic knowledge and skills are further developed. Oral communication and reading skills are practiced. The of the second state	•	
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		
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.		
04XFZ5 French for Beginners Z5	Z	2
All four skills acquired in FZ4 are further developed, as well as technical language. Students prepare a paper on a chosen popular science topic. The	y present it orally	in the class. The
general contents is covered by lessons 24 - 26 of the textbook: Pravda-Pravdova, French for Beginners, and is complemented from other materials.	Topics: on physics	s from lecture
notes, success of French science and technology, information about France. Grammar is systemized and complemented with syntax (subordinate cl	auses, typical cor	njunctions,
subjunctive clauses, gerund, passive.		
04XNM2 German for Intermediate Students M2	7	2
The course introduces other more complex grammatical structures and their application in communication based on technical texts, such as the relation	n between techno	. –
the world at the beginning of the 21st century, linguistically more demanding texts on the environment, the language of mathematics, computers and		
practise reading for information and reading aloud, and appropriate language for various purposes in oral and written communication. The course system		
phenomena important for professional discourse (participles, relative clauses).		anor grannadoar
	Z	2
04XNM1 German for Intermediate Students M1	-	
The objective of the course is to level off the students' skills in the German language. The course focuses on revision of more difficult phenomena an		
word formation processes (e.g. importance of verb prefixes). In the lexical part, it covers topics referring to higher education in both the Czech Repul	-	
environmental issues together with all necessary expressions and phrases, expressions and phrases needed to chemists, mathematicians, physicis	ts, and the fundar	nentals 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	l car technology e	tc. Students
practise reading for information and reading aloud, and appropriate language for various purposes in oral and written communication. The course syster	natically revises o	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	eainning of the
course. The course is then focused on working with technical and scientific texts and practising reading techniques (skimming, scanning, reading for		
more difficult grammar structures necessary for understanding a subtechnical text (passive voice, participles, participle structures) and it also focuses on		-
i.e., telephoning.	,	
04XNP2 German for Advanced Students P2	Z	2
The course develops the students' skills in working with professional scientific texts (understanding, summarising, note-taking, interpreting) while extend		
vocabulary range. It introduces mathematical expressions and texts of nuclear power engineering. Increasing emphasis is placed on understanding and	a practising iorma	communication,
both written and oral (CV, letter of application, interview, scholarship), and more complex grammatical structures (i.e., subjunctive, indirect speech).		
04XNP3 German for Advanced Students P3	Z	2
The course consists of 3 main parts (general communicative situations, grammar and technical topics). Students will develop their vocabulary in a va		
(traffic problems and car accidents, accident report, filling in a form, complaints). Based on presentations and technical and subtechnical texts, the v	ocabulary range i	n fields such as
nuclear power engineering, the environment, computer science, and car technology, will also be extended. Only authentic professional texts are use	d. By means of a	presentation,
students are trained to process information gained from their reading of complex and difficult texts and present it to the class in a simplified oral form. The students are trained to process information gained from their reading of complex and difficult texts and present it to the class in a simplified oral form.	he course also inc	ludes translation
practice to and from German.		
04XRM1 Russian for Intermediate Students M1	Z	2
The course is designed for students with previous knowledge of Russian from secondary schools. Students are supposed to know the Russian alphat	bet (both printed a	ind handwritten),
basic vocabulary for communication in everyday situations (introductions, socializing, greetings, shopping for food and objects of everyday need, ask		
they can use basic grammar structures (verbal and nominal forms, irregular verbs, pronouns). The initial knowledge corresponds to the achievement	level of the RZ2	course. The
contents and scope of the course correspond approximately to the RZ3 course, but for half of the time allotted in the timetable.		
04XRM2 Russian for Intermediate Students M2	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.	· -	-
	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, ior nair of	the time allotted
in the timetable.		

0.4VDD4 Duration for A durate of Obstate 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 la	nguage structures, practicing more difficult 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, specific syntactic
structures). Stress is put on independent oral and written communication.	
04XRP3 Russian for Advanced Students P3	Z 2
	_ _
The course is based on RP2 and is mainly focused on working with technical and scientific texts (reading comprehension, oral	
courses require good previous knowledge of general language at secondary level (listening, reading, correct communication in	
these skills. Further study is aimed at professional and technical skills (reading technical literature according to the students' s	
develop their subtechnical vocabulary and practice quick and correct communication in professional situations. They will be able	e to both speak write accurately and with 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 profession	al texts written in Russian. Thus it begins with mastering
the Russian alphabet (for both reading and writing skills) and fundamentals of grammar necessary for everyday communication	
a short text with marked stress, understand its contents and summarize it.	
	7 0
04XRZ2 Russian for Beginners Z2	Z 2
The second semester of the programme is designed to teach skills for basic communication in everyday situations and for reac	ing easy and short subtechnical texts. Students will be
able to communicate using short sentences and appropriate structures, and read aloud with confidence a short text without ma	rked stress. They will also develop their vocabulary and
master further grammatical structures. They will have mastered with confidence the Russian alphabet and will be able to use it	in writing.
04XRZ3 Russian for Beginners Z3	Z 2
The course is based on RZ2 and includes further everyday topics, develops understanding of short compact texts on new subter	
and listening) and introduces new grammar. Students will be trained to distinguish intonation patterns while listening to spoken	anyuaye. They will be able to respond so as to be
understood, and to express their opinion. Writing skills will be trained on guided writing tasks and note-taking.	
04XRZ4 Russian for Beginners Z4	Z 2
The course is based on RZ3. It improves and expands the knowledge of general language in all four skills (reading and understar	iding longer texts with a certain percentage of unfamiliar
words, oral communication in everyday situations, writing longer texts). Students are trained to use grammar structures effective	ely (e.g., irregular verbs, differences in verb patterns
from Czech, modality, imperatives, conditionals). They practice and develop communication skills for everyday situations (food,	
communication on more specific topics (environment, addictions, the green movement). They become acquainted with various	
	geographical data (e.g., Obena), learn now to minin
forms, look up the information from the timetable, learn about Russian holidays and typical meals.	
04XRZ5 Russian for Beginners Z5	Z 2
The course expects the student to have completed RZ4. It concentrates predominantly on reading skills (working with profession	al texts, i.e. understanding, extracting and summarizing
information from a specialized text) and speaking, and to a certain extent, writing about the professional information obtained b	y reading the texts. Communication skills are trained on
everyday topics. Studying grammar is based on professional and technical texts and only includes items typically used in profe	ssional communication (verbal adjectives, participles,
passive voice). Students develop their technical and economic vocabulary, and are also trained in some professional skills (writ	
	Z 2
	I I
The course is designed for students whose competence is at level B1 of CEFR, i.e. those who studied Spanish in the secondar	
vocabulary and pays attention to further grammar topics (e.g., perifrasis verbales, futuro imperfecto, direct object and indirect of	
subjunctive), to written and oral communication on a given everyday or easy subtechnical topic, for which the students are train	ed by reading texts or listening to them.
04XSM2 Spanish for Intermediate Students M3	Z 2
The course develops the students' knowledge from the previous course (SM1). Students are gradually acquainted with fundam	entals of Spanish for specific purposes in order to be
able to work with specialized texts on the Internet.	
04XSM3 Spanish for Intermediate Students M3	7 2
The course books are supplemented with additional subtechnical materials, so the students will be gradually acquainted with the	
enough to use the Internet in Spanish and search for information of their specialization or field of interest. Students will use the	
final part of the programme, general Spanish course based on course books, covers presentations and, finally, a written and or	al 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 a	s written communication. Course prerequisites: level B2
of CEFR.	
	7 0
04XSP2 Spanish for Advanced Students P2	Z 2
Course SP2 is the second part of the advanced Spanish course, extending Spanish for specific purposes topics. It comprises r	nore grammar and syntax 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 futu	e specialization. It is focused on written communication
based on what students will need in their career.	
	7 0
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 fundamental grammar structures and will
be able to communicate at an elementary level on topics of everyday life. They will acquire and extend fundamental vocabulary	of general Spanish and will develop it.
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. Grar	1 1
them to understand short adapted written texts and speech. Attention is also paid to cultural differences between Spanish-spea	
Realia of Spanish-speaking countries are also included.	
04XSZ3 Spanish for Beginners Z3	Z 2
The course is based on course SZ2, and develops the student's vocabulary and grammar structure. The course covers realia (history and culture) of the Spanish-speaking countries,
mainly of Spain. It pays attention to further grammar topics (pretérito perfecto, pretérito indefinido, pretérito imperfecto, the geru	and and the imperative). It includes written and oral
communication on a given general topic, for which the student is trained by reading texts or listening to them.	
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	1 – 1 –
Spain. It pays attention to further grammar topics (perifrasis verbales, futuro imperfecto, direct object and indirect object pronot	
to written and oral communication on a given general or subtechnical topic, for which the student is trained by reading texts or	
04XSZ5 Spanish for Beginners Z5	Z 2
The course books are supplemented with additional subtechnical materials, so the students will be gradually acquainted with p	eculiarities of Spanish for specific purposes. In its final
part, the general Spanish course based on the course book will end with presentations and, finally, a written and oral examinat	

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
	used on the acquisition of speech and voice techniques and on the rules of correct pronounciation. The course is also devoted to the	composition of pul	blic speech
as well as to its	nonverbal aspects. Stylistics exercises, strategies for coping with stage-fright and a short excursion into the history of rhetoric are an	integral part of the	e course.
00UPRA	Introduction to Law	Z	1
00UPSY	Introduction to Psychology	Z	1
01ANB3	Calculus B 3	Z,ZK	8
	uences and series - convergence range, criteria of uniform convergence, continuity, limit, differentiation and integration of functional		es, Series
equation and exact side, Euler differen of set, completenes	r's theorem. 2. Ordinary differential equations - equations of first order (method of integration factor, equation of Bernoulli, separation equation) and equations of higher order (fundamental system, reduction of order, variation of parameters, equations with constant coe tial equation). 3. Metric spaces - metric, norm, scalar product, neighborhood, interior and exterior points, boundary point, isolated and as of space, Hilbert spaces. Orthogonal polynomials. Complete orthogonal systems. 4. Fourier series - expansion of functions into Fourier provergence. 5. Differential calculus of functions of several variables - limit, continuity, partial and directional derivative, gradient, total calculor series, elementary terms of vector analysis, Jacobi matrix. 6. Functions defined implicitly by one or several equations	fficients and specia d non-isolated poir er series, trigonom derivatives and tan	al right-hand it, boundary etric Fourier
01ANB4	Calculus B 4	Z.ZK	6
prom nných, ne Integrální po et f	o et funkcí více prom nných a funkcionálních vektor . [2] Funkce zadané implicitn . [3] Taylorovy ady funkce více prom nných. [4] F kartézské soustavy sou adnic. [5] Lokální, vázané a globální extrémy funkce více prom nných. [6] Základy teorie míry a obrys konstr unkce více prom nných - Riemann v a Lebesgue v integrál, základní vlastnosti, Fubiniova v ta, v ta o substituci. Leviho a Lebesgu derivace integrálu podle parametru. [8] Integrály po k ivkách a plochách. Integrální v ty.	ukce Lebesgueov eova v ta. Limita,	y míry. [7] spojitost a
01LAL	Linear Algebra 1	Z	2
1. Vector space. 2	. Linear dependence and independence. 3. Basis and dimension. 4. Subspaces of vector spaces. 5. Linear mappings. 6. Matrices of li	inear mappings. 7.	Frobenius
	theorem.		
product and orthog	Linear Algebra 2 se matrix and operator. 2. Permutation and determinant. 3. Spectral theory (eigenvalue, eigenvector, diagonalization). 4. Hermitian an onality. 6. Metric geometry. 7. Riesz theorem and adjoint operator. Outline of the exercises: 1. Methods for calculation of inverse matri	ices. 2. Methods of	calculation
Outline: 1. Inverse product and orthog of determinants.	Linear Algebra 2 se matrix and operator. 2. Permutation and determinant. 3. Spectral theory (eigenvalue, eigenvector, diagonalization). 4. Hermitian an jonality. 6. Metric geometry. 7. Riesz theorem and adjoint operator. Outline of the exercises: 1. Methods for calculation of inverse matri 3. Calculation of eigenvalues and eigenvectors. 4. Hermitian and quadratic forms. Canonical form. 5. Scalar product and orthogonalit complements. 6. Geometry exercises and examples. 7. Adjoint operators.	d quadratic forms. ices. 2. Methods of y. Calculation of o	5. Scalar calculation
Outline: 1. Inverse product and orthog of determinants. 01LALZ	Linear Algebra 2 se matrix and operator. 2. Permutation and determinant. 3. Spectral theory (eigenvalue, eigenvector, diagonalization). 4. Hermitian an jonality. 6. Metric geometry. 7. Riesz theorem and adjoint operator. Outline of the exercises: 1. Methods for calculation of inverse matri 3. Calculation of eigenvalues and eigenvectors. 4. Hermitian and quadratic forms. Canonical form. 5. Scalar product and orthogonalit complements. 6. Geometry exercises and examples. 7. Adjoint operators. Linear Algebra 1, exam	d quadratic forms. ices. 2. Methods of y. Calculation of or ZK	5. Scalar f calculation thogonal
Outline: 1. Inverse product and orthog of determinants.	Linear Algebra 2 se matrix and operator. 2. Permutation and determinant. 3. Spectral theory (eigenvalue, eigenvector, diagonalization). 4. Hermitian an jonality. 6. Metric geometry. 7. Riesz theorem and adjoint operator. Outline of the exercises: 1. Methods for calculation of inverse matri 3. Calculation of eigenvalues and eigenvectors. 4. Hermitian and quadratic forms. Canonical form. 5. Scalar product and orthogonalit complements. 6. Geometry exercises and examples. 7. Adjoint operators.	d quadratic forms. ices. 2. Methods of y. Calculation of o	5. Scalar calculation thogonal
Outline: 1. Inverse product and orthogo of determinants. 01LALZ 01MAN	Linear Algebra 2 se matrix and operator. 2. Permutation and determinant. 3. Spectral theory (eigenvalue, eigenvector, diagonalization). 4. Hermitian an jonality. 6. Metric geometry. 7. Riesz theorem and adjoint operator. Outline of the exercises: 1. Methods for calculation of inverse matri 3. Calculation of eigenvalues and eigenvectors. 4. Hermitian and quadratic forms. Canonical form. 5. Scalar product and orthogonalit complements. 6. Geometry exercises and examples. 7. Adjoint operators. Linear Algebra 1, exam Calculus 1 Basic calculus (real analysis, functions of one real variable, differential calculus).	d quadratic forms. ices. 2. Methods of y. Calculation of or ZK Z	5. Scalar calculation thogonal
Outline: 1. Inverse product and orthogo of determinants. 01LALZ 01MAN 01MAN2	Linear Algebra 2 se matrix and operator. 2. Permutation and determinant. 3. Spectral theory (eigenvalue, eigenvector, diagonalization). 4. Hermitian an jonality. 6. Metric geometry. 7. Riesz theorem and adjoint operator. Outline of the exercises: 1. Methods for calculation of inverse matri 3. Calculation of eigenvalues and eigenvectors. 4. Hermitian and quadratic forms. Canonical form. 5. Scalar product and orthogonalit complements. 6. Geometry exercises and examples. 7. Adjoint operators. Linear Algebra 1, exam Calculus 1	d quadratic forms. ices. 2. Methods of y. Calculation of or ZK Z Z,ZK	5. Scalar calculation thogonal 2 4 8
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02DEF1	History of Physics 1	Z	2
, ,	ace in the system of sciences. The relationship of man and nature. Natural sciences in ancient Orientand Greece, Greek natural philo	•	
Helenistic period,	Archimed. Arabic science, European science in Middle Ages. Renaissance - da Vinci, Giordano Bruno. Copernicus, Kepler, Galileo, H as experimental science. Newton and his work.	luygens. The birth	of physics
02DEF2	History of Physics 2	Z	2
	f classical mechanics after Newton, Bernoulli's, Euler, Lagrange. Historical development of optics, corpuscular and wave approach. E		
	vanism, electrodynamics and electromagnetism, Faraday and Maxwell. Thermodynamics and its laws, statistical physics, Boltzmann.		•
and relativistic p	physics, 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 Universe of today.	774	6
02ELMA	Electricity and Magnetism pulomb's law, electrostatic field, Gauss' law. Electric dipole, polarization. Conductors and dielectrics. Electric current and circuits, cond	Z,ZK	6 he relativity
e .	Electrodynamic forces, magnetic field. Magnetic dipole, magnetics. Electromagnetic induction, RLC circuits. Electromagnetic waves, I		no relativity
02MECH	Mechanics	Z	4
	ivsics, physical quantities and units. Kinematics of a particle, basic types of motion and their superposition. Dynamics of a particle, so	lving equations of	-
	notion, motion in a central force field, forces in non-inertial reference frames. Mechanics of a system of particles, two-body problems,		
	of a rigid body, rotation.		
02MECHZ	Mechanics - Examination	ZK	2
	The content of the subject is the examination according to the plan of studies.		
02ZM1	Foundations of Physical Measurements 1	ZK	2
	gned for students of physical specializations (Experimental particle physics, Physical engineering, Nuclear engineering), however, it c		
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
007140	basic habits of work in a physics lab.	1/7	4
02ZM2	Foundations of Physical Measurements 2	KZ K	4 atudanta of
	gned for students of physical specializations (Experimental particle physics, Physical engineering, Nuclear engineering), however, it c he goal of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired data		
other branches. I	basic habits of work in a physics lab.	a on a r o. oludeni	s learn the
04AKS	English Conversation	Z	1
	evelop the student's communication skills acquired throughout their previous studies. It aims to improve all aspects of oral communication	ation. The student v	vill develop
their vocabulary for	or various communication situations and will master their communication strategy. They will also practise their listening skills in order t	o better follow and	participate
in c	iscussions. The student will be trained to express their ideas clearly and according to current English usage, and become a more con	ifident speaker.	
04XAM1	English for Intermediate Students M1	Z	2
The course is desi	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
	anguages (CEFR). It provides an introduction into English for Specific and Academic Purposes (ESP, EAP), i.e., into fundamentals 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 inter-	erest. Attention is a	also paid to
0.4)(4)40	extending the knowledge of grammar issues used in EAP.		
04XAM2	English for Intermediate Students M2		2 functions
	expects the student to have completed the AM1 course. It develops their skills for work with subtechnical texts, focusing also more on pical of ESP and EAP (e.g., definition, existence and classification of phenomena, object descriptions). Part of the course is also guided		
	revision is included.	whiling. If heeessal	y, granna
04XAM3	English for Intermediate Students M3	Z	2
	bs the skills that enable students to cope with features typical of professional style. Increasing attention is paid to developing subtechnic	–	ndependent
understanding o	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 chosen topic re	elated to the
	student's field.		
04XAMZK	English for Intermediate Students Examination	ZK	4
	ent is the examination as given by the study plan. The examination covers the AM1, AM2, and AM3 courses and consists of two parts) and oral
	30 min). The student is expected to master the AM syllabus and demonstrate the ability to apply their knowledge gained in the three E		
04XAP1	English for Advanced Students P1	Z	2
	igned for students who have successfully completed the full secondary school English language course (at least the B1 level of the C	-	
	Languages - CEFR). It provides an introduction into English for Specific and Academic Purposes (ESP, EAP), i.e., into the fundamential of professional oral and written communication situations (fundamentals of terms in mathematics and physics, definitions, given and the second s	-	
	l oral and written communication on topics related to the undergraduate's life and needs. It develops skills for free professional writing (w		,
	polite request). If necessary, revision of selected grammar topics is included.		
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
	d, if possible, a case study). Increasing emphasis is placed on the undergraduate's independent work with and reading of linguistical		
The course extend	s the student's subtechnical vocabulary, and includes fundamental notions of chosen branches of science. It is focused on formal writing the student's subtechnical vocabulary, and includes fundamental notions of chosen branches of science. It is focused on formal writing the student's subtechnical vocabulary, and includes fundamental notions of chosen branches of science. It is focused on formal writing the student's subtechnical vocabulary, and includes fundamental notions of chosen branches of science. It is focused on formal writing the student's subtechnical vocabulary, and includes fundamental notions of chosen branches of science. It is focused on formal writing the student's subtechnical vocabulary is student.	ng including the se	entence and
	paragraph structure, linking, cohesion and coherence in texts.		<u> </u>
04XAP3	English for Advanced Students P3	Z	2
	based on AP2 and expects the student to work without any guidance with authentic professional materials and to interpret the text. It in ills and functions (e.g., expressing an opinion, agreement, and objections; taking part in discussion, note-taking; summarizing, writing	-	
	project on a given or chosen topic and presenting it. The course places emphasis on distinguishing levels of formal and informal lang		-
	communication.	<u>.</u>	
04XAPZK	English for Advanced Students Examination	ZK	4
	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	I I	-
	courses. The examination consists of 2 parts - written (100 min) and oral (30 min) and includes also oral presentation of a topic from		-
04XCESM1	Czech for Foreigners - Intermediate 1	Z	2
The course is focus	ed on correct pronunciation, important morphological phenomena, prepositional phrases, and verb forms as well as on extending the si	udent's vocabulary	y for various
	social situations.		

04XCESM2	Czech for Foreigners - Intermediate 2	Z	2
	ps the topics covered in CESM1 and is then focused on more difficult grammar phenomena. It practices writing, speaking, and readir	ig skills and trains	the student
	in understanding common abbreviations, abbreviated words, and mathematical terms and formulas.		
04XCESM3	Czech for Foreigners - Intermediate 3	Z	2
The last course i	revises morphological topics covered earlier and extends the student's knowledge of more difficult language phenomena. It is especia	ally focused on sty	listics and
	lexicology and on developing the student's writing skills.		1
04XCESMZK		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	M1,2,3 courses ar	nd can only
	be taken after successful completion of the 3 courses. Detailed information is to be obtained from the teacher.	7	0
04XCESP1	Czech for Foreign Students - Advanced 1 the course is very good knowledge of the Czech language, i.e., communicative competences at least at level B2 of the Common Europ	Z Soon Framowork o	f Poforonco
	v on revision of standard language structures, but mainly on practising more complex grammatical structures typical of the style of sci		
	nal style of engineering and professional communication, both in spoken and written form. The topics include University Studies and S		-
	includes communication with teachers and faculty administrators.		·
04XCESP2	Czech for Foreigners - Advanced 2	Z	2
This course extend	Is the student's knowledge acquired in CESP1 and focuses on difficult language phenomena. It practises working with technical and	specialist texts pla	cing greater
	emphasis on individual work.		
04XCESP3	Czech for Foreigners - Advanced 3	Z	2
The course develo	ps the student's knowledge from CESP2. It includes working with authentic specialist materials, their interpretation and presentation, a	and, finally, presen	ntation of the
	student's project. Writing skills necessary for professional communication are trained.		
04XCESPZK	Czech for Foreign Students - Advanced Examination	ZK	4
The course 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.	7	<u> </u>
04XCESZ1	Czech for Foreigners - Beginners 1 gned for students of the English programme. Students will become acquainted with the main characteristics of Czech (phonetic and g	Z	2
	Jage and speaking skills. The course focuses on pronunciation exercises, simple social phrases, and oral and written communication		
	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
	I communication competences acquired in CESZ1 are further developed. Students deepen their knowledge of the declension and cor	njugation system a	and practise
	basic communication topics. The course covers roughly lessons 3-5 in Czech Express by L. Holá and P. Bo ilová.		
04XCESZ3	Czech for Foreigners - Beginners 3	Z	2
The course furthe	er develops the language and communication competences acquired in the XCESZ1 and XCESZ2 courses. The teaching focuses on	building up basic \	vocabulary,
	inciation and deepening grammar, features through practice, as well as introducing the Czech culture. Students are asked to produce	-	
frequent types of d	ialogue. 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
	I. Orach far Farsinger Daringer - Furgination	71/	4
04XCESZZK	Czech for Foreigners Beginners - Examination	ZK	4
	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		-
The course conte	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.	CESZ1,2,3 course	es and can
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04XFPZK	French for Advanced Students Examination	ZK	4
The whole French	program is ended with an examination covering the contents of FP1-FP3. The examination consists of a written and/or an oral part a	and is organized ac	ccording to
	Examination Instructions, a document available on the web. Assessment of the presentation is included into the examination gra		
04XFZ1	French for Beginners Z1	Z	2
-	rs The objective of this 5-level course is to be able to communicate in French orally and in writing in situations of everyday life, in soci		
	es French for specific / technical communication and reading of popular science and scientific texts. FZ1 The objective is to be able to		,
-	ising the knowledge of chosen elementary language. The contents is roughly outlined by lessons 1 - 7 of the textbook Pravda - Pravd		-
	za áte ky). It is extended with situations of communication and functions from the textbook Espaces I, lessons 1-4 : introductions, pe lirections, simple instructions and questions. Special attention is paid to pronunciation. Spelling is explained in connection with pronu		-
04XFZ2	French for Beginners Z2		2
-	ng up with FZ1. Elementary linguistic knowledge and communication skills are expanded. The scope is given by lessons 8 - 13 of the	textbook: Pravda -	_
	ners. Additional topics and skills are filled in from the textbook Espaces I, lesson 1 - 5 (introductions, invitation, welcoming, agreeme		
Ŭ	map of France, food, expression of will, wish, order, prohibition, pleasure). Correct pronunciation is practiced. Stress on oral communic	0,	1 057
	How does the machine work? A few expressions concerning the study. Name of University and Faculty.		
04XFZ3	French for Beginners Z3	Z	2
The course builts	upon FZ2. Basic linguistic knowledge and skills are developed. The contents is given by lessons 14 - 18 of the textbook: Pravda - Pra	vdová: French for	Beginners.
Topics, functions	and situations are complemented from other materials. Stress is put on oral communication in dialogues and on reading, both for infe	ormation and loud	as part of
	pronunciation practice. Reading covers short adapted texts of general interest first, and later popular science texts.		
04XFZ4	French for Beginners Z4	Z	2
The course builds	up on FZ3. Basic linguistic knowledge and skills are further developed. Oral communication and reading skills are practiced. The con	itents is roughly co	overed with
	ne textbook French for Beginners, and is expanded with topics and functions from other materials. Reading is developed from the lecture		
Students of FJFI.	The course covers generals and specific topics: health- illness, sport, free time, environment, study, travelling in France, Paris, shoppi		ersity in our
	country and in France, how to write CV, application, topics in mathematics, reading physics - mechanics, informatics, internet		
04XFZ5	French for Beginners Z5	Z	2
	ed in FZ4 are further developed, as well as technical language. Students prepare a paper on a chosen popular science topic. They pr		
-	is covered by lessons 24 - 26 of the textbook: Pravda-Pravdova, French for Beginners, and is complemented from other materials. To		
notes, success	of French science and technology, information about France. Grammar is systemized and complemented with syntax (subordinate cla subjunctive clauses, gerund, passive	auses, typical conju	unctions,
	subjunctive clauses, gerund, passive.	71/	2
04XFZZK	French for Beginners Examination examination as given by the study plan. The course is terminated with an examination consisting of oral and written part. The examination	ZK	3 document
The content is the	Instruction for examination. Its content covers the levels FZ1 - FZ5.	alloff is fulled by life	
04XNM1	German for Intermediate Students M1	Z	2
-	e course is to level off the students' skills in the German language. The course focuses on revision of more difficult phenomena and st	I – I	_
-	processes (e.g. importance of verb prefixes). In the lexical part, it covers topics referring to higher education in both the Czech Repu		-
	sues together with all necessary expressions and phrases, expressions and phrases needed to chemists, mathematicians, physicists	-	
	terminology. It develops communication on related topics and is aimed at correct pronunciation, grammatical correctness and unders		
04XNM2	German for Intermediate Students M2	Z	2
	ces other more complex grammatical structures and their application in communication based on technical texts, such as the relation be	I I	
the world at the b	beginning of the 21st century, linguistically more demanding texts on the environment, the language of mathematics, computers and c	car technology etc.	Students
practise reading for	information and reading aloud, and appropriate language for various purposes in oral and written communication. The course systematic	cally revises other ç	grammatical
	phenomena important for professional discourse (participles, relative clauses).		
04XNM3	German for Intermediate Students M3	Z	2
	ces other more complex grammatical structures and their application in communication based on technical texts, such as the relation be		-
	beginning of the 21st century, linguistically more demanding texts on the environment, the language of mathematics, computers and c		
practise reading for	information and reading aloud, and appropriate language for various purposes in oral and written communication. The course systemation and the course systemation and the course systemation and the course systemation and the course systematic system		
	nhonomono important for professional dissource (participles, relative alouese)	cally revises other (grammatical
	phenomena important for professional discourse (participles, relative clauses).		
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The course conten	German for Intermediate Students Examination is the examination as given by the study plan. The whole German for Intermediate Students Course is completed by an examination of ver the courses NM1 - NM3. The oral part follows after passing the written part successfully and after obtaining the 04NM3 assessme	ZK consisting of two pa	4 arts - written
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they can use bas	sic grammar structures (verbal and nominal forms, irregular verbs, pronouns). The initial knowledge corresponds to the achievement contents and scope of the course correspond approximately to the RZ3 course, but for half of the time allotted in the timetal		uise. me
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	1	-
04XRM3	Russian for Intermediate Students M3	Z	2
The course develop	os the knowledge and skills acquired in RM1 and RM2 and its contents and scope are roughly at the same level as those of RZ5, how	ever, for half of the	time allotted
04XRMZK	in the timetable. Russian for Intermediate Students Examination	ZK	4
	t is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowled	1	1 -
	ents are eligible for the oral examination only after a prior pass in RM3 and a successful written examination. Students are given inst		
04XRP1	Russian for Advanced Students P1	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 technical language and training writing skille.	cticing more difficul	t grammar
04XRP2	structures, understanding the fundamentals of technical language and training writing skills. Russian for Advanced Students P2	Z	2
	ed on RP1. It expands grammatical structures important for understanding technical texts (verbal adjectives, participles, passives, ve	-	1
	structures). Stress is put on independent oral and written communication.	1 / 1	,
04XRP3	Russian for Advanced Students P3	Z	2
	ed on RP2 and is mainly focused on working with technical and scientific texts (reading comprehension, oral and written paraphrasin od previous knowledge of general language at secondary level (listening, reading, correct communication in everyday situations). Th		
	er study is aimed at professional and technical skills (reading technical literature according to the students' specialization, oral and w		
	chnical vocabulary and practice quick and correct communication in professional situations. They will be able to both speak write acc	-	-
	technical topics.		1
04XRPZK	Russian for Advanced Students Examination	ZK	4
	t is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowled ents are eligible for the oral examination only after a prior pass in RP3 and a successful written examination. Students are given inst		
04XRZ1	Russian for Beginners Z1	Z	2
	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	th mastering
the Russian alphat	bet (for both reading and writing skills) and fundamentals of grammar necessary for everyday communication (listening and speaking). Students will be	able to read
042072	a short text with marked stress, understand its contents and summarize it.	7	2
04XRZ2 The second semes	Russian for Beginners Z2 ster of the programme is designed to teach skills for basic communication in everyday situations and for reading easy and short subt	-	1
	te using short sentences and appropriate structures, and read aloud with confidence a short text without marked stress. They will also		
	master further grammatical structures. They will have mastered with confidence the Russian alphabet and will be able to use it in	writing.	1
04XRZ3	Russian for Beginners Z3 d on RZ2 and includes further everyday topics, develops understanding of short compact texts on new subtechnical topics (for training	Z	2
The course is base	d on R72 and includes further everyday tonics, develops understanding of short compact texts on new subtechnical tonics (for training	n various torms of ri	
		-	-
	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.	-	-
	d introduces new grammar. Students will be trained to distinguish intonation patterns while listening to spoken language. They will be	-	-
and listening) an 04XRZ4 The course is base	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 d	e able to respond so Z certain percentage	o as to be
and listening) an 04XRZ4 The course is base 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 c nuncation in everyday situations, writing longer texts). Students are trained to use grammar structures effectively (e.g., irregular verses)	able to respond so Zertain percentage s, differences in ver	o as to be 2 of unfamiliar rb patterns
and listening) an 04XRZ4 The course is base words, oral comm from Czech, mo	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 d	a able to respond so Zertain percentage s, differences in ver and practice oral ar	o as to be 2 of unfamiliar rb patterns nd written
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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 focu based on what students will need in their career.	ised on written com	nmunication
04XSPZK	Spanish for Advanced Students Examination	ZK	4
The course conten	t is the examination as given by the study plan. Examination SPZK consists of two parts, namely oral and written. The prerequisite for a passed the written test. Examination content is based on syllabi of courses SP1, SP2, and SP3 or on an individual study plan of the	-	art is naving
04XSZ1	Spanish for Beginners Z1	Z	2
	first stage of the five-semester programme of Spanish studies; during the first stage the students will master phonetics and fundamental verse of event day life. They will acquire and extend fundamental verse bullary of general Span	-	
04XSZ2	communicate at an elementary level on topics of everyday life. They will acquire and extend fundamental vocabulary of general Span Spanish for Beginners Students Z2		2
	ed on course SZ1, and expects students to develop and extend the knowledge and skills acquired so far. Grammar structures and lexis	ا 🗠 🗠 » will be chosen so	1
them to understand	d short adapted written texts and speech. Attention is also paid to cultural differences between Spanish-speaking countries and other	s such as the Czec	ch Republic.
	Realia of Spanish-speaking countries are also included.		
04XSZ3	Spanish for Beginners Z3	Z	2
	ed on course SZ2, and develops the student's vocabulary and grammar structure. The course covers realia (history and culture) of the It pays attention to further grammar topics (pretérito perfecto, pretérito indefinido, pretérito imperfecto, the gerund and the imperative		
	communication on a given general topic, for which the student is trained by reading texts or listening to them.	,	
04XSZ4	Spanish for Beginners Z4	Z	2
	ed on course SZ3. It develops the student's vocabulary and extends the knowledge of the culture and social customs of the Spanish		-
Spain. It pays atte	ention to further grammar topics (perifrasis verbales, futuro imperfecto, direct object and indirect object pronouns, negative form of the to written and oral communication on a given general or subtechnical topic, for which the student is trained by reading texts or listenii		ubjunctive),
04XSZ5	Spanish for Beginners Z5	7	2
	are supplemented with additional subtechnical materials, so the students will be gradually acquainted with peculiarities of Spanish for	r specific purposes	1
	part, the general Spanish course based on the course book will end with presentations and, finally, a written and oral examina		
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 he	e/she has
11ZFP	passed the written examination test. Basic to Solid State Physics	ZK	3
	amental properties of solids following the regular long distance ordering of atoms in a crystal lattice. Based on the introduced bonding	I I	-
	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 in	-	
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 s interpret a broad phenomenological basis of physical properties of crystalline solids	systematically intro	duce and
11ZFPL	Basic to Solid State Physics	KZ	2
	damental properties of solids following the regular long distance ordering of atoms in a crystal lattice. Based on the introduced bonding	g interaction betwe	en atoms in
	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 in xplained. The special consequences of band approach to the physical properties of solids are elucidated. The aim of the course is to s	-	
	interpret a broad phenomenological basis of physical properties of crystalline solids	yotomation y march	
12NME1	Numerical Methods 1	Z,ZK	4
	ed the basic principles of numerical mathematics important for numerical solving of problems important for physics and technology. Me		
important for phys	sicists (ordinary differential equations, random numbers) are included in addition to the basic numerical methods. Integrated computat used as a principle programming language as a demonstration tool. The seminars are held in computer laboratory.	ional environment l	MAILAB IS
12ZEL1	Basic Electronics 1	Z,ZK	3
	ides primary knowledge of circuit theory concerning principles of electronic circuits in both stationary and harmonic stable state. Circu	I	
circuits includ	le symbolic and complex method are explained. Proper circuit analysis is also lectured. The subject's final part deals with transient eff	ects inside linear c	ircuits.
12ZEL2	Basic Electronics 2	Z,ZK	3
	ws up with the Basic Electronics 1. Semiconductor elements basic properties are explained. Thecourse's final part deals with basic th		
14FKO	Metal Physics ical background of processes encountered in production and thermo-mechanical treatment of metallic materials is described, including	Z,ZK	6 stal defects
	theory of solid solutions, theory of dislocations, diffusion, hardening and softening of metals and alloys.	g · · · · · · · · · · · · · · · · ·	,
14TEM	Engineering Mechanics	Z,ZK	6
Abstract: The cour	rse represents a link-up between the theoretical mechanics of rigid bodies and engineering disciplines dealing with stress and strain a	analysis of real stru	cture parts
	(elasticity, plasticity, fracture mechanics, etc.). Principles of statics, kinematics, and dynamics and their application.	7.71/	F
15FCHN1	Physical Chemistry 1 art is devoted to the recapitulation of the thermodynamic systems and thermodynamic properties of ideal and real gases. Next chapters	Z,ZK	5 first second
	ermodynamics and their applications. Last but not least, attention is devoted also to the thermodynamic, phase and chemical equilibriur		
	of nonequilibrium thermodynamics.	,,	
15FCHN2	Physical Chemistry 2	Z,ZK	5
	I Chemistry 2 focuses on thermodynamics of solutions, particularly on electolytes. Basics of colloidal chemistry extend the theory of so	I I	the lecture.
15JCHDC The following topic	Nuclear Chemistry for DC s are discussed in detail in the course: Nuclear reactions yield, reaction cross section. Fission reaction, spontaneous fission. Chemistr	Z,ZK	-
	ction, local temperature, atomic recoil and recoil energy, recoil of atom bound in a molecule, hot atom chemistry, retention, Szilard Cha	-	
15OCH	General Chemistry	Z,ZK	6
	ry, classification of substances, concentrations, chemical reactions and equations, stoichiometric calculations, atoms and molecules,		
matter, chemical th	ermodynamics, first law of thermodynamics, thermochemistry, second law of thermodynamics, entropy, Gibbs energy, phase and chemi pH, reaction kinetics, kinetic equation, Arrhenius' equation.	cai equilibria, electr	rocnemistry,
15POBCH	Laboratory Exercises in General Chemistry	KZ	3
	duced to basic laboratory techniques in chemical lab. At the beginning, the health and safety training in chemical/radiochemical labs a		
laboratory equipme	ent (analytical scales, automatic pipettes, etc.) are required. During individual work students get the knowledge of basic chemical method	ls (precipitation, cry	ystallization,

filtration, 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 behing	1 1	
Students are introduced into fundamental radiochemical techniques (dilution of radioactive solutions, extraction techniques, working with radionuclide practical knowledge in the field of decontamination (characterization of contamination, control smears and the methods of chemical de		s will gain
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 regular meetings and discussions.	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,	1 1	
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		
a visit to one of the repositories in the Czech Republic (Richard). Decontamination techniques will be tested in a special hall in SÚJCHBO v.v.i., Kamen of workplaces after the mining of radioactive minerals will be demonstrated in the TÚU, DIAMO s., Stráž pod Ralskem. There will also be demonstrated i		•
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		
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		
and in human life. The lectures are given by students and absolvents of DDAIR, who are currently employed at the department or in various organizat v.v.i., ÚJV ež, MI, Hospital Na Homolce, FN v Motole, PTC Czech s.r.o., CERN, Fermilab). The lectures will focus not only on describing research a	• • •	
dosimetry, but students will also learn more about Bachelor degree thesis topics and thus will learn more about their possible specialization during	-	
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	1 1	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 lee thematic areas: development of opinions on micro-wave and radiation physics, basic characteristics of the atom and nucleus, binding energy, measure		
of the nuclei, the most important nuclear models. General characteristics of the interaction of ionizing radiation with the matter, interaction of alpha, beta		
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 le	-	
thematic areas: general properties of radioactive decay, alpha decay, proton radioactivity, beta decay, gamma emission, natural radioactivity, properties nuclear fission, transuranium elements, thermonuclear reaction.	and types of nuclea	r reactions,
16UVJZ Introduction to Decommissioning of Nuclear Facilities	Z,ZK	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	1 · · ·	-
of the decommissioning project. It includes implementation of site decommissioning including legislative requirements to protect employees and the en	/ironment against ra	diation and
waste management in their categorization, transport, release to the environment and disposal. It deals with documentation and centralization		
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, ioni. absorption. Fundamentals of the effects of ionizing radiation.	ations, energy trans	sier 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 spectrometric	1	
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	f the course is to une	derstand to
basic principles of detection and calibration of common instruments in the field of ionizing radiation measurement.		
16ZIVB Introduction to Ecology	KZ	2
The subject inform about basic of the ecologic principles, terms and ideas. It covers overview information regarding to particular components of the envir 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	1 1	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 II	 The course include 	es practical
exercises with processing the data and subsequent presentation of the results.		
16ZPSP Basic Work with PC 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 devo	Z	2 (stems 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	-	
software) with exercises in MS Office. The practical content focuses mainly on further use during studies (laboratory reports, research work, bachelor		
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.		
16ZRAO Basics of Radiation Protection 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 co	Z 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 i	-	
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 req		-
16ZRIZ Health risks of ionizing radiation	1 1	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.	ZK	
	gical effects of ionizir	ng radiation
(IR) at the molecular, cellular and tissue levels, an overview of deterministic and stochastic effects of ionizing radiation, health harm, risk and its evalu	pical effects of ionizir ation, basics of epid	ng radiation lemiology.
(IR) at the molecular, cellular and tissue levels, an overview of deterministic and stochastic effects of ionizing radiation, health harm, risk and its evaluation 17BPJZ Introduction to Nuclear Safety The aim of the subject is to familiarize students with basic principles of nuclear safety.	gical effects of ionizir	ng radiation

17JARE	Nuclear Reactors	ZK	2
Introduction. World	power issue. Previous evolution of power reactor. Nuclear fission reactors, fuel assemblies, active core, control systems, safety system	ns, containment. C	lassification
of reactors into IV g	enerations. Standard types of nuclear power reactors: concept, description, layout, previous evolution, world share, perspectives. Press	surized water read	tors (PWR).
Western-type	PWR (Westinghouse, KWU, Framatom). VVER-type reactors, Temelín nuclear power plant. Boiling water reactors. Heavy water reactor	ors, fast breeder r	eactors,
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 repres	ents short introduction into display methods, technical drawing in different fields and geography. The goal is to familiarize students with i	multidisciplinary fu	indamentals
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 Matlat	environment as efficient tool for computation in complex arrays and symbolic variables, namely for linear algebra, mathematic analys	sis, statistics, algo	rithmization
	and geometric representation of results.		
			x
18ZPRO	Basics of Programming	Z	4
	Basics of Programming ntended mainly for students with little or no experience in programming. It familiarizes the students with the basic concepts in program	Z nming and with the	-
		Z nming and with the	-
	ntended mainly for students with little or no experience in programming. It familiarizes the students with the basic concepts in program	Z nming and with the Z	-
This course is i	ntended mainly for students with little or no experience in programming. It familiarizes the students with the basic concepts in program programming language.	Z nming and with the Z Z	-
This course is i TV-1	ntended mainly for students with little or no experience in programming. It familiarizes the students with the basic concepts in program programming language. Physical Education	Z nming and with the Z Z Z	-

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