Study plan

Name of study plan: Jaderná a ásticová fyzika

Faculty/Institute/Others:

Department:

Branch of study guaranteed by the department: Welcome page

Garantor of the study branch:

Program of study: Nuclear and Particle Physics

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: BSPJCF1

Name of the group: BS P_J FB 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

	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their					
Code	members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
02ELMA	Electricity and Magnetism Iskender Yalcinkaya, Goce Chadzitaskos, Josef Schmidt, Jan Vysoký Jan Vysoký Goce Chadzitaskos (Gar.)	Z,ZK	6	4+2	L	Р
01LAL	Linear Algebra 1 Petr Ambrož, 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 (Gar.)	ZK	2	0P+0C		Р
01LAL2	Linear Algebra 2 Petr Ambrož, Lubomíra Dvo áková Lubomíra Dvo áková (Gar.)	Z,ZK	4	2P+2C		Р
01MAN	Calculus 1 Miroslav Kolá, Pavel Strachota, Edita Pelantová Pavel Strachota Edita Pelantová (Gar.)	Z	4	4+4		Р
01MANZ	Calculus 1, exam Miroslav Kolá, Pavel Strachota, Edita Pelantová Pavel Strachota Pavel Strachota (Gar.)	ZK	4	0P+0C		Р
01MAN2	Calculus 2 Severin Pošta, Miroslav Kolá, Edita Pelantová Miroslav Kolá Severin Pošta (Gar.)	Z,ZK	8	4P+4C		Р
02MECH	Mechanics Iskender Yalcinkaya, David Be Michal Jex David Be (Gar.)	Z	4	4+2	Z	Р
02MECHZ	Mechanics - Examination Iskender Yalcinkaya, Goce Chadzitaskos, David B e , Filip Petrásek, Stanislav Skoupý, Antonín Hoskovec, Petr Novotný Antonín Hoskovec David B e (Gar.)	ZK	2	-	Z	Р
00PT	Preparatory Week Petr Ambrož, Milan Krbálek Petr Ambrož Petr Ambrož (Gar.)	Z	2	týden	Z	Р
02TER	Heat and Molecular Physics Filip Petrásek Petr Novotný Petr Jizba (Gar.)	Z,ZK	4	2+2	L	Р
02ZM1	Foundations of Physical Measurements 1 Solangel Rojas Torres, Libor Škoda, Petr Chaloupka Martin Štefa ák Petr Chaloupka (Gar.)	ZK	2	2P+0C	Z	Р
02ZM2	Foundations of Physical Measurements 2 Petr Chaloupka Martin Štefa ák Petr Chaloupka (Gar.)	KZ	4	0P+4L	L	Р

18ZPRO	Basics of Programming Maksym Dreval, Vladimír Jarý, Miroslav Virius, Jakub Klinkovský, Petr Pauš, František Vold ich, Jan Tomsa, Zuzana Pet í ková Miroslav Virius Miroslav Virius (Gar.)	Z	4	4C	Z	Р
Characteristics	of the courses of this group of Study Plan: Code=BSPJCF1 Name=BS	P_J FB 1	st year			
02ELMA	Electricity and Magnetism			Z	Z,ZK	6
	omb's law, electrostatic field, Gauss' law. Electric dipole, polarization. Conductors anddielectrics.	. Electric currer	nt and circui			-
	ic forces,magnetic field. Magnetic dipole, magnetics. Electromagnetic induction, ac currents. Elec					,
01LAL	Linear Algebra 1			İ	Z	2
-	near dependence and independence. 3. Basis and dimension. 4. Subspaces of vector spaces. 5.	Linear mannin	as 6 Matri	es of linear		
theorem.	ical dependence and independence. o. basis and annersion. 4. cabspaces of vector spaces. o.	Linear mapping	95. 0. Matri	oo or iiricar	mappings.	7.1100011103
01LALZ	Linear Algebra 1, exam				ZK	2
	<u> </u>					
01LAL2	Linear Algebra 2 atrix and operator. 2. Permutation and determinant. 3. Spectral theory (eigenvalue, eigenvector, c			1	Z,ZK	4
of determinants. 3. C complements. 6. Geo	nality. 6. Metric geometry. 7. Riesz theorem and adjoint operator. Outline of the exercises: 1. Meth alculation of eigenvalues and eigenvectors. 4. Hermitian and quadratic forms. Canonical form. 5. metry – exercises and examples. 7. Adjoint operators.					
01MAN	Calculus 1				Z	4
Basic calculus (real a	nalysis, functions of one real variable, differential calculus).					
01MANZ	Calculus 1, exam				ZK	4
01MAN2	Calculus 2			Z	Z,ZK	8
	erential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergence	, operations on	series, abs	1		onvergence 3.
	wer series, the Cauchy-Hadamard theorem, expansion of function into power series, summation	-				-
	techniques of integration and application of integrals, Generalized Riemann integral		,	Ü		· ·
02MECH	Mechanics				7	4
in central force field, continuum mechanic	s, physical quantities and units. Particle kinematics, basic types of motion and theirsuperposition. forces innoninertial reference frames. Mechanics of system of free particles, two-body problem, or , elasticity, hydrodynamics. Sound.	-		d body, rota	tion. Funda	
02MECHZ	Mechanics - Examination				ZK	2
The content of the su	bject is the examination according to the plan of studies.					
00PT	Preparatory Week				Z	2
02TER	Heat and Molecular Physics			Z	Z,ZK	4
	f materials, heat transfer; stationary and non-stationary heat conduction, heat transfer and pene	tration; 1st and	2nd thermo			al and real gas,
•	Il systems: dielectric and magnetic materials; Maxwell relations and thermodynamic potentials; ki					_
02ZM1	Foundations of Physical Measurements 1				ZK	2
	ed for students of physical specializations (Experimental particle physics, Physical engineering,	Nuclear engine	erina) how	1		-
_	goal of the lecture is to introduce the basics of physical measurements, the methods of processing	_				-
basic habits of work	•	ng ana ovalaati	on or acqui	ou uutu oii	2 1 O. O.uu	onto loani tilo
02ZM2	Foundations of Physical Measurements 2				KZ	4
	ed for students of physical specializations (Experimental particle physics, Physical engineering,	Nuclear engine	oring) how	1	- 1	•
	goal of the lecture is to introduce the basics of physical measurements, the methods of processing.					
basic habits of work		ig and evaluati	on or acqui	eu uata on	a FG. Sidul	ents learn the
18ZPRO	Basics of Programming			١.	Z	4
	ed mainly for students with little or no experience in programming. It familiarizes the students wit	n the basic con	icepts in pro	ogramming a	ina with the	Pytnon
programming langua	je.					
Code of the o	group: BSPJCF2					
`	group: BS P_J FB 2nd year					
	credits in the group:					
Cquirernem	ordana in trie group.					

Requirement courses in the group: In this group you have to complete at least 10 courses

Credits in the group: 0

Note on the group: Předmět 02TEF1 lze absolvovat až po absolvování předmětu 02MECHZ. Předmět 02TEF2 lze absolvovat až po absolvování předmětů 02ELMA a 02TEF1.

Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their Completion Credits Code Scope Semester Role members) Tutors, authors and guarantors (gar.) **Experimental Physics** Barbara Antonina Trzeciak, Jaroslav Adam, Jaroslava Óbertová, Katarína K ížková Gajdošová **Jaroslava Óbertová** Katarína K ížková Gajdošová (Gar.) 2P+0C Ζ 02EXF ZK 2 Р Experimental Laboratory 1 Libor Škoda, Barbara Antonina Trzeciak, Katarína K ížková Gajdošová, Jaroslav 02PRA1 ΚZ 6 Ζ 0+4Ρ Biel ík Jaroslav Biel ík Jaroslav Biel ík (Gar.) Experimental Laboratory 2
Libor Škoda, Jaroslav Biel ík Jaroslav Biel ík (Gar.) 02PRA2 ΚZ 6 0+4L Р Calculus B 3 01ANB3 8 4P+4C Z,ZK Ρ Miroslav Kolá, Milan Krbálek Miroslav Kolá Milan Krbálek (Gar.) Calculus B 4 01ANB4 Z,ZK 6 2P+4C Ji í Mikyška, Miroslav Kolá, Milan Krbálek **Milan Krbálek** Milan Krbálek (Gar.)

12NME1	Numerical Methods 1 Pavel Váchal Pavel Váchal (Gar.)	Z,ZK	4	2+2	L	Р
02TEF1	Theoretical Physics 1 Petr Novotný Petr Novotný Igor Jex (Gar.)	Z,ZK	4	2+2	Z	Р
02TEF2	Theoretical Physics 2 Filip Petrásek, Petr Novotný Josef Schmidt Petr Novotný (Gar.)	Z,ZK	4	2+2	L	Р
02TSFA	Thermodynamics and Statistical Physics Jaroslav Novotný, Igor Jex Antonín Hoskovec Igor Jex (Gar.)	Z,ZK	4	2+2	L	Р
02VOAF	Waves, Optics and Atomic Physics Josef Schmidt, Petr Novotný Jan Vysoký Ji í Tolar (Gar.)	Z,ZK	6	4+2	Z	Р

Characteristics of the courses of this group of Study Plan: Code=BSPJCF2 Name=BS P_J FB 2nd year

02EXF Experimental Physics ZK 2
The goal of this subject is to introduce the students the principles of physics measurements, their techniques, methods and instruments that are used for such measurements, and the analysis of measured data.

02PRA1 Experimental Laboratory 1

KZ 6

Lecture is intended especially for students who intend to study some of the physical specializations of FNSPE(branch Physical Engineering, Nuclear Engineering). But it can be also attended by students interested in the otherspecializations. In Experimental laboratory students learn how to prepare for experiments (including work with theliterature), the implementation of the measurement (acquire of different experimental procedures and routines), willteach writing the records of measurement, processing and evaluation of results. At the same time practically extendthe knowledge gained in lectures on physics.

02PRA2 Experimental Laboratory 2

7

6

Lecture is intended especially for students who intend to study some of the physical specializations of FNSPE(branch Physical Engineering, Nuclear Engineering). But it can be also attended by students interested in the otherspecializations. In Experimental laboratory students learn how to prepare for experiments (including work with theliterature), the implementation of the measurement (acquire of different experimental procedures and routines), willteach writing the records of measurement, processing and evaluation of results. At the same time practically extendthe knowledge gained in lectures on physics.

01ANB3 Calculus B 3

Z,ZK

8

1. Functional sequences and series - convergence range, criteria of uniform convergence, continuity, limit, differentiation and integration of functional series, power series, Series Expansion, Taylor's theorem. 2. Ordinary differential equations - equations of first order (method of integration factor, equation of Bernoulli, separation of variables, homogeneous equation and exact equation) and equations of higher order (fundamental system, reduction of order, variation of parameters, equations with constant coefficients and special right-hand side, Euler differential equation). 3. Metric spaces - metric, norm, scalar product, neighborhood, interior and exterior points, boundary point, isolated and non-isolated point, boundary of set, completeness of space, Hilbert spaces. Orthogonal polynomials. Complete orthogonal systems. 4. Fourier series - expansion of functions into Fourier series, trigonometric Fourier series and their convergence. 5. Differential calculus of functions of several variables - limit, continuity, partial and directional derivative, gradient, total derivatives and tangent plane, Taylor series, elementary terms of vector analysis, Jacobi matrix. 6. Functions defined implicitly by one or several equations.

01ANB4 Calculus B 4

Z,ZK

6

[1] Diferenciální po et funkcí více prom nných a funkcionálních vektor . [2] Funkce zadané implicitn . [3] Taylorovy ady funkce více prom nných. [4] Regulární zobrazení, zám na prom nných, nekartézské soustavy sou adnic. [5] Lokální, vázané a globální extrémy funkce více prom nných. [6] Základy teorie míry a obrys konstrukce Lebesgueovy míry. [7] Integrální po et funkce více prom nných - Riemann v a Lebesgue v integrál, základní vlastnosti, Fubiniova v ta, v ta o substituci. Leviho a Lebesgueova v ta. Limita, spojitost a derivace integrálu podle parametru. [8] Integrály po k ivkách a plochách. Integrální v ty.

12NME1 Numerical Methods 1

Z,ZK

4

There are explained the basic principles of numerical mathematics important for numerical solving of problems important for physics and technology. Methods for solution of tasks very important for physicists (ordinary differential equations, random numbers) are included in addition to the basic numerical methods. Integrated computational environment MATLAB is used as a principle programming language as a demonstration tool. The seminars are held in computer laboratory.

02TEF1

Theoretical Physics 1

Z,ZK

4

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

02TEF2 Theoretical Physics 2

Z,ZK

4

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

02TSFA Thermodynamics and Statistical Physics

Z,ZK

4

Foundation of thermodynamics and statistical physics. Thermodynamic potential, the Joule Thomson effect, conditions of equilibrium, the Braun-Le Chatelier principle. Statistical entropy. Basics of many body descriptionfrom a statistical point of view (classical and quasiclassical regime within the frame of a canonical and grand-canonical ensemble, Fermi gas, models of crystals and the black body radiation). The Boltzmann equation is used to discusses simple transport phenomena.

02VOAF Waves, Optics and Atomic Physics

Z.ZK

6

Wave phenomena in mechanics and electromagnetism: modes, standing and travelling waves, wave packets indispersive media. Wave optics: polarization, interference, diffraction, coherence. Geometrical optics. Introduction toquantum physics: black body radiation, quantum of energy, photoeffect, the Compton effect, the de Broglie waves, the Schrodinger equation, stationary states and spectra of finite systems.

Code of the group: BSPJCF3

Name of the group: BS P_J FB 3rd year

Requirement credits in the group:

Requirement courses in the group: In this group you have to complete at least 10 courses

Credits in the group: 0

Note on the group:

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

analýzy a Lineární algebry.

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
02BPJC1	Bachelor Project 1 Jaroslav Biel ik Jaroslav Biel ik (Gar.)	Z	5	0P+5C	Z	Р
02BPJC2	Bachelor Project 2 Jaroslav Biel ik Jaroslav Biel ik (Gar.)	Z	10	0P+10C	L	Р
02DPD1	Detectors and Principles of Detection 1 Solangel Rojas Torres, Jesus Guillermo Contreras Martin Štefa ák Jesus Guillermo Contreras (Gar.)	ZK	2	2P+0C	Z	Р
02DPD2	Detectors and Principles of Detection 2 Solangel Rojas Torres, Jesus Guillermo Contreras Martin Štefa ák Jesus Guillermo Contreras (Gar.)	ZK	4	4P+0C	L	Р
02KM1	Quantum Mechanics 1 Martin Štefa ák Martin Štefa ák Martin Štefa ák (Gar.)	Z,ZK	6	4P+2C	Z	Р
02KM2	Quantum Mechanics 2 Martin Štefa ák Martin Štefa ák Martin Štefa ák (Gar.)	Z,ZK	6	4P+2C	L	Р
01RMAF	Equations of Mathematical Physics Václav Klika Václav Klika Václav Klika (Gar.)	Z,ZK	7	4P+2C		Р
02SF	Subatomic Physics Jan epila Jan epila (Gar.)	Z,ZK	6	4+2	Z	Р
02SF2	Subatomic Physics 2 Petr Chaloupka Martin Štefa ák Petr Chaloupka (Gar.)	Z,ZK	6	4+2	L	Р
02VS1	Workshop 1 Jaroslav Biel ík Jaroslav Biel ík (Gar.)	Z	1	7D	Z	Р

D2BPJC1	Bachelor Project 1	Z	5
Abstract: The bache	lor project is based on a topic approved by the administrators of the programme, department and by the dean. The student i	s guided by the project	supervisor
luring common reg	ular meetings and discussions.		
D2BPJC2	Bachelor Project 2	Z	10
Abstract: The bache	lor project is based on a topic approved by the administrators of the programme, department and by the dean. The student i	s guided by the project	supervisor
luring common reg	ular meetings and discussions.		
D2DPD1	Detectors and Principles of Detection 1	ZK	2
Abstract: The lectur	es introduce the main forms of interaction of some particles with matter. The goal is that the student gets an overview of wha	at type of processes are	possible and
n which situations f	hey may be dominant. Some applications to Medicine and to study the fundamental structure of matter are presented.		
D2DPD2	Detectors and Principles of Detection 2	ZK	4
Abstract: The lectur	es introduce the main ideas needed to understand how detector systems work. It will be focused on gaseous detecting princ	iples, scintilating princip	les and
emiconductor dete	cting principles. Basic information about various detector constructions is provided.		
02KM1	Quantum Mechanics 1	Z,ZK	6
Abstract: The lectur	e describes the birth of quantum mechanics and description of one particle and more particles by elements of the Hilbert spac	ce as well as its time evo	lution. Beside
hat it includes desc	ription of observable quantities by operators in the Hilbert space and calculation of their spectra.		
02KM2	Quantum Mechanics 2	Z,ZK	6
\bstract: The lectur	e expands the introduction to quantum mechanics with more general formalism of quantum theory, approximate methods an	d path integral. It summ	ū
	e expands the introduction to quantum mechanics with more general formalism or quantum theory, approximate methods an thods used in various applications of quantum mechanics and prepares the students for an effective scientific research and fu		arizes the
	thods used in various applications of quantum mechanics and prepares the students for an effective scientific research and fu		arizes the
erminology and me	thods used in various applications of quantum mechanics and prepares the students for an effective scientific research and fu		arizes the
erminology and me ormulations of qua D1RMAF	thods used in various applications of quantum mechanics and prepares the students for an effective scientific research and funtum field theory.	rther study, in particular	arizes the of the moder
erminology and me ormulations of qua D1RMAF The subject of this o	thods used in various applications of quantum mechanics and prepares the students for an effective scientific research and funtum field theory. Equations of Mathematical Physics	rther study, in particular	arizes the of the moder
erminology and me ormulations of qua D1RMAF The subject of this o	thods used in various applications of quantum mechanics and prepares the students for an effective scientific research and funtum field theory. Equations of Mathematical Physics Equations of Mathematical Physics	rther study, in particular	arizes the of the model

become familiar with basic accelerating principles and with current particle physics experimental centers.

Subatomic Physics 2

The aim of the course is to teach students the basics of physics of atomic nucleus. Students will acquire knowledgeabout the basic properties of atomic nuclei and the way they can be measured. They will learn basic models, whichdescribe the structure of the atomic nucleus and nuclear reactions. Part of the lectures is also getting familiar with thephysics of the cosmic radiation and applications of nuclear physics.

02VS1 Workshop 1 Ζ

Abstract: Students will participate on annual Workshop J F, where they will present results obtained during the work on their bachelor thesis. During other presentations from students and staff, they will also get familiar with scientific topics developed at the department and with methods other colleagues use for their scientific work.

Name of the block: Compulsory elective courses

Minimal number of credits of the block: 0

The role of the block: PV

Code of the group: BSSPOLVEDY

Name of the group: BS - Social Sciences

Requirement credits in the group:

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

Credits in the group: 0

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

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

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

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

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

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

Credits in the group: 0 Note on the group:

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 Michal Beneš	ZK	4		Z	PV
04XAPZK	English for Advanced Students Examination Michal Beneš	ZK	4		Z	PV
04XCESZZK	Czech for Foreigners – Beginners - Examination Jana Ková ová, Slav na Brownová	ZK	4		Z	PV
04XCESMZK	Czech for Intermediate Students Examination Jana Ková ová Jana Ková ová Jana Ková ová (Gar.)	ZK	4		Z	PV
04XCESPZK	Czech for Foreign Students - Advanced Examination Jana Ková ová Michal Beneš Jana Ková ová (Gar.)	ZK	4		Z	PV
04XFMZK	French for Intermediate Students Examination Michal Beneš	ZK	4		Z	PV
04XFPZK	French for Advanced Students Examination Michal Beneš	ZK	4		Z	PV
04XFZZK	French for Beginners Examination V ra Šlechtová	ZK	3		L	PV
04XNMZK	German for Intermediate Students Examination Michal Beneš	ZK	4		Z	PV
04XNPZK	German for Advanced Students Examination Michal Beneš	ZK	4		Z	PV
04XRMZK	Russian for Intermediate Students Examination Michal Beneš	ZK	4		Z	PV
04XRPZK	Russian for Advanced Students Examination Michal Beneš	ZK	4		Z	PV
04XRZZK	Russian for Beginners Examination V ra Šlechtová	ZK	3		L	PV
04XSMZK	Spanish for Intermediate Students Examination Michal Beneš	ZK	4		Z	PV
04XSPZK	Spanish for Advanced Students Examination Michal Beneš	ZK	4		Z	PV
04XSZZK	Spanish for Beginners Examination V ra Šlechtová	ZK	3		L	PV

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

04XAMZK	English for Intermediate Students Examination	ZK	4
The course content i	is the examination as given by the study plan. The examination covers the AM1, AM2, and AM3 courses and consists of tw	o parts - written (100 m	nin) and oral
20-30 min). The stu	dent is expected to master the AM syllabus and demonstrate the ability to apply their knowledge gained in the three Englis	h courses.	
4XAPZK	English for Advanced Students Examination	ZK	4
he course content i	s the examination as given by the study plan. The student is supposed to demonstrate mastering the AP3 syllabus and the a	ability to apply their kno	wledge obtaine
the three AP cours	ses. The examination consists of 2 parts - written (110 min) and oral (30 min) and includes also oral presentation of a topic	from the student's field	d of study.
4XCESZZK	Czech for Foreigners – Beginners - Examination	ZK	4
he course content i	is the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of	the 04XCESZ1,2,3 cou	rses and can
nly be taken after s	uccessful completion of all three courses. Detailed information is to be obtained from the teacher.		
4XCESMZK	Czech for Intermediate Students Examination	ZK	4
he course content i	is the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of	the CESM1,2,3 course:	s and can only
e taken after succe	ssful completion of the 3 courses. Detailed information is to be obtained from the teacher.		
4XCESPZK	Czech for Foreign Students - Advanced Examination	ZK	4
he course content i	is the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of	the CESP1,2,3 courses	and can only
e taken after succe	ssful completion of the 3 courses. Detailed information is to be obtained from the teacher.		
4XFMZK	French for Intermediate Students Examination	ZK	4
he content is the ex	kamination as given by the study programme. The whole French programme is ended with an examination covering the cor	ntents of FM1-FM3. The	e examination
onsists of a written	and oral part and is organized according to Examination Instructions, a document available on the web.		
4XFPZK	French for Advanced Students Examination	ZK	4
he whole French pr	rogram is ended with an examination covering the contents of FP1-FP3. The examination consists of a written and/or an or	al part and is organized	d according to
xamination Instruct	tions, a document available on the web. Assessment of the presentation is included into the examination grading.		
4XFZZK	French for Beginners Examination	ZK	3
he content is the ex	kamination as given by the study plan. The course is terminated with an examination consisting of oral and written part. The	e examination is ruled t	by the docume
struction for exami	nation. Its content covers the levels FZ1 - FZ5.		
4XNMZK	German for Intermediate Students Examination	ZK	4
he course content i	s the examination as given by the study plan. The whole German for Intermediate Students Course is completed by an exan	nination consisting of tv	vo parts - writte
nd oral, which cove	or the courses NM1 - NM3. The oral part follows after passing the written part successfully and after obtaining the 04NM3 a	ssessment. More detai	led information
to be obtained from	n the teacher.		
4XNPZK	German for Advanced Students Examination	ZK	4
he course content i	is the examination as given by the study plan. The whole German for Advanced Students Course is completed by an exam	ination consisting of tw	o parts - writte
nd oral, which cove	er the courses NP1 - NP3. The oral part follows after passing the written part successfully and after obtaining the 04NP3 un	graded assessment. M	lore detailed
formation is to be o	obtained from the teacher.		
4XRMZK	Russian for Intermediate Students Examination	ZK	4
he course content i	is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the	knowledge and skills a	cquired in RM
RM3. Students are	eligible for the oral examination only after a prior pass in RM3 and a successful written examination. Students are given in	structions by the teach	er.
4XRPZK	Russian for Advanced Students Examination	ZK	4
he course content i	is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the	knowledge and skills a	cquired in RP
RP3. Students are	eligible for the oral examination only after a prior pass in RP3 and a successful written examination. Students are given ins	tructions by the teache	er.
4XRZZK	Russian for Beginners Examination	ZK	3
he course content i	is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the	knowledge and skills a	cquired in RZ
RZ5. Students are	eligible for the oral examination only after a prior pass in RZ5 and a successful written examination. Students are given ins	tructions by the teache	r.
4XSMZK	Spanish for Intermediate Students Examination	ZK	4
	s the examination as given by the study plan. SMZK examination consists of two parts - written and oral; to be eligible for the	written part, students w	rill have obtaine
	nent for course SM3.Oral examination follows the written part.		
4XSPZK	Spanish for Advanced Students Examination	ZK	4
_	s the examination as given by the study plan. Examination SPZK consists of two parts, namely oral and written. The prerequ	1 1	· ·
	est. Examination content is based on syllabi of courses SP1, SP2, and SP3 or on an individual study plan of the student.		
account the William to			
		<i>7</i> K	3
4XSZZK	Spanish for Beginners Examination is the examination as given by the study plan. Examination consists of two parts - written and oral. Student can register for	ZK oral examination only it	3 f he/she has

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

The role of the block: V

Code of the group: BSPJCFV

Name of the group: BS P_J FB Optional courses

Requirement credits in the group: Requirement courses in the group:

Credits in the group: 0

Note on the group:

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

			•	•		
Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
02DEF1	History of Physics 1 Igor Jex, Miroslav Myška Miroslav Myška Igor Jex (Gar.)	Z	2	2+0	Z	V

02DEF2	History of Physics 2 Igor Jex Miroslav Myška Igor Jex (Gar.)	Z	2	2+0	L	V
01FKO	Functions of Complex Variable Pavel Š oví ek Pavel Š oví ek Pavel Š oví ek (Gar.)	Z,ZK	3	2+1		V
02FYS1	Physical Seminar 1 Martin Štefa ák Vojt ch Svoboda (Gar.)	Z	2	0+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 Be Martin Stefa ák	Z	1	0+1		٧
00MAM2	Essentials of High School Math Course 2 Lukáš Heriban Severin Pošta Lukáš Heriban (Gar.)	Z	1	0+1		٧
02NSAD1	Simulations and Data Analysis Tools 1 Zden k Hubá ek Zden k Hubá ek (Gar.)	Z	2	2P+0C	Z	٧
02NSAD2	Simulations and Data Analysis Tools 2 Zden k Hubá ek Zden k Hubá ek (Gar.)	Z	2	2+0		V
01NME2	Numerical Methods 2 Michal Beneš Michal Beneš (Gar.)	KZ	2	2+0	L	V
15CH1	General Chemistry 1 Ond ej Holas, Petr Distler, Václav uba Petr Distler Petr Distler (Gar.)	Z	3	2+1	Z	V
15CH2	General Chemistry 2 Ond ej Holas, Petr Distler, Václav uba Petr Distler Petr Distler (Gar.)	Z,ZK	3	2+1	L	V
01PRST	Probability and Statistics Tomáš Hobza Tomáš Hobza Tomáš Hobza (Gar.)	Z,ZK	4	3+1	Z	V
18PRC1	Programming in C++ 1 Vladimír Jarý, Miroslav Virius Miroslav Virius Miroslav Virius (Gar.)	Z	4	2+2	Z	V
18PRC2	Programming in C++ 2 Vladimír Jarý, Miroslav Virius, Jakub Klinkovský Miroslav Virius Miroslav Virius (Gar.) Virius (Gar.)	KZ	4	2+2	L	V
02STR	Special Theory of Relativity David Be Martin Štefa ák David Be (Gar.)	ZK	2	2+0	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
02UFEC	Introduction to Elementary Particle Physics Jaroslav Biel ik, Marek Matas Jaroslav Biel ik Jaroslav Biel ik (Gar.)	Z	2	2+0	Z	V
17UING	Introduction to Engineering Jan Frýbort, Petr Haušild, Radek Mušálek Jan Frýbort (Gar.)	KZ	3	2P+1C	Z	V
02UKP1	Introduction to Curves and Surfaces Ladislav Hlavatý Martin Štefa ák Ladislav Hlavatý (Gar.)	Z	2	1P+1C	L	V
02UKP2	Introduction to Curves and Surfaces 2 Ladislav Hlavatý Martin Štefa ák Ladislav Hlavatý (Gar.)	Z	2	1P+1C	Z	V
02UKT	Introduction to Quantum Theory Martin Štefa ák Martin Štefa ák Martin Štefa ák (Gar.)	Z	2	2+0		V
01UP1	Introduction to Probability 1 Jan Vybíral Jan Vybíral Jan Vybíral (Gar.)	Z,ZK	3	1P+1C		V
01UP2	Introduction to Probability 2 Milan Krbálek Milan Krbálek Milan Krbálek (Gar.)	Z,ZK	3	1P+1C		V
12UNXAP	Introduction to UNIX Milan Kucha ik Milan Kucha ik Milan Kucha ik (Gar.)	Z	2	1P+1C	L	V
12VKT	Vacuum Technology Richard Švejkar Vojt ch Petrá ek Vojt ch Petrá ek (Gar.)	KZ	4	2P+2L	Z	V
12PYTH	Scientific Programming in Python Pavel Váchal, Jakub Urban Pavel Váchal Pavel Váchal (Gar.)	Z	2	0+2	L	V
12VTV	Scientific and Technical Computing Ivan Procházka Ivan Procházka Ivan Procházka (Gar.)	Z	2	1+1	L	V
18ZALG	Basics of Algorithmization Vladimír Jarý, Miroslav Virius, Petr Pauš, František Vold ich, Zuzana Pet í ková, František Gašpar Vladimír Jarý Miroslav Virius (Gar.)	Z,ZK	4	2+2	L	V
17ZEL	Basics of Electronics Martin Kropík Martin Kropík (Gar.)	KZ	3	2+2	Z	V
02ZSM	Introduction to the Standard Model Zden k Hubá ek Zden k Hubá ek (Gar.)	ZK	2	2+0		V
01ROZ1	Image Processing and Pattern Recognition 1	ZK	4	2+2	L	V
01ROZ2	Image Processing and Pattern Recognition 2	ZK	3	2+1	Z	V

Characteristics of the courses of this group of Study Plan: Code=BSPJCFV Name=BS P_J FB Optional courses

02DEF1 History of Physics 1

Physics and its place in the system of sciences. The relationship of man and nature. Natural sciences in ancient Orientand Greece, Greek natural philosophers, Aristotle. Physics in Helenistic period, Archimed. Arabic science, European science in Middle Ages. Renaissance - da Vinci, Giordano Bruno. Copernicus, Kepler, Galileo, Huygens. The birth of physics as experimental science. Newton and his work.

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, Boltzmar 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	, particies,
01FKO	Functions of Complex Variable	Z,ZK	3
	utlining the Jordan curve theorem and the Riemann-Stieltjes integral. Then basic results of complex analysis in one variable at		ail: the derivative
•	d the Cauchy-Riemann equations, holomorphic and analytic functions, the index of a point with respect to a closed curve, C	, ,	
theorem, roots of a holor theorem.	norphic function, analytic continuation, isolated singularities, the maximum modulus principle, Liouville's theorem, the Cauchy	estimates, Laurer	it series, residue
02FYS1	Physical Seminar 1	Z	2
	to detailed study of interesting physical problems. It should help students to deeper understanding of fundamentals of physic		
	is are chosen, studied and presented by the students themselves, with the possibility to use PC and physical laboratory equ	-	
04AKS	English Conversation	Z	1
· ·	the student's communication skills acquired throughout their previous studies. It aims to improve all aspects of oral communication skills acquired throughout their previous studies.		
•	bus communication situations and will master their communication strategy. They will also practise their listening skills in ord		and participate
00MAM1	ent will be trained to express their ideas clearly and according to current English usage, and become a more confident spea Essentials of High School Course 1	Z	1
00MAM2	Essentials of High School Math Course 2	Z	1
Review of basics of high		_	•
02NSAD1	Simulations and Data Analysis Tools 1	Z	2
	ations of high energy elementary particle collisions. ROOT and Pythia programs.	· · · · · · · · · · · · · · · · · · ·	
02NSAD2	Simulations and Data Analysis Tools 2	Z	2
	de implementation and testing of a program for generating of particle collision. Results are reviewed.		
01NME2	Numerical Methods 2	KZ	2
	numerical solution of boundary-value problems and intial-boundary-value problems for ordinary and partial differential equations to initial-value problems and finite-difference methods for elliptic, parabolic and first-order hyperbolic partial differential equ		thods converting
15CH1	General Chemistry 1	Z	3
,	cepts, quantities and units used in chemistry are introduced in the course General Chemistry I. Their significance and practi-	. – .	
solved in exercises.			, ,
15CH2	General Chemistry 2	Z,ZK	3
	nuation of the course General chemistry I. The main attention is paid to general principles governing chemical processes. Us		
the validity of these prin- in exercises.	ciples is not restricted only to chemical processes is documented. The significance and practical use of explained principles	are illustrated by	examples solved
1	Probability and Statistics	Z,ZK	4
	obability theory and mathematical statistics. The probability theory is build gradually beginning with the classical definition a	1 ' 1	· .
	s random variable, distribution function of random variable and characteristics of random variable are treated and basic limit		ted and proved.
	ory the basic methods of mathematical statistics such as estimation of distribution parameters and hypothesis testing are expenses to the control of the con		
18PRC1	Programming in C++ 1 lly the C programming language and non-object oriented features of the C++ language.	Z	4
18PRC2	Programming in C++ 2	KZ	4
· ·	bject oriented programming and othesr advanced constructs in the C+;+ programming language and the Standard Templat	1 1	· •
02STR	Special Theory of Relativity	ZK	2
Students extend their kn	lowledge of classical, non-quantum mechanics of the special theory of relativity fundamentals.	1 1	
TV-1	Physical Education	Z	1
TV-2	Physical Education	Z	1
TV-3	Physical education	Z	1
TV-4	Physical education	Z	1
02UFEC	Introduction to Elementary Particle Physics	Z	2
· · · · · · · · · · · · · · · · · · ·	easily accessible introduction to elementary particle physics. Development, methods, goals and perspectives of the subject		
17UING	Introduction to Engineering roduction to Engineering skills at basic level (e.g. material properties and be roduction to engineering skills. Students should gain general engineering skills at basic level (e.g. material properties and be	KZ	3 manufacturing
· · · · · · · · · · · · · · · · · · ·	assurance, environmental impacts,). In addition, the introduction to scientific work and technical drawing will be included.	Fliavior, basics of i	nandiacturing
02UKP1	Introduction to Curves and Surfaces	Z	2
The goal of the lecture is	s an introduction to the differential geometry of simple manifolds - curves and two-dimensional surfaces. The basic concepts	1 1	!
-	plained. In the surface theory we introduce first and second fundamental forms and mean and Gaussian curvature. Essential p	part of the lecture a	are the examples
calculated by students.			
02UKP2	Introduction to Curves and Surfaces 2 course 02UKP1. The properties of the first fundamental form are briefly summarized. The concept of the second fundamental form are briefly summarized.	Z Z	2
	curvature. Finally, the usual concepts of Riemann geometry are introduced.	ai ioiiii is iiitiouuc	ed, leading to
02UKT	Introduction to Quantum Theory	Z	2
· ·	to introduce the basic principles of quantum theory and its interpretation on simple examples.	·	
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		
-	; Bayes' theorem, medical diagnosis, Simpson's paradox 5.Random variable with discrete state space, its distribution and m	ean value 6.Probl	ems involving
	value 7.Probabilistic method in graph theory 8.Random algorithms, Morris algorithm and its variants Introduction to Probability 2	Z,ZK	3
ı	tinuous random variable and its statistical description. 2. Distribution function and probability density. 3. Axiomatic introductic	1 1	-
	erical characteristics of continuous random variables. 5. Selected variants of continuous distributions and their characteristic		
estimations. 7. Generation	ng pseudorandom numbers from the selected distribution.		

12UNXAP Introduction to UNIX	Z	2
Computer and operating systems. Personal computer, workstation and supercomputers. Processor, memory, bus, devices, hard disk, network inter	face. Hardware an	d software.
Principles of operating systems. Operating system UNIX. Basic principles, kernel, kernel services. Documentation. File system, file atributes, working	ng with files. Text ε	editors: vi, emacs.
Command interpreter (shell) bash and its programming (scripts). Controlling processes, process status, computer load a process priorities. Standar	rd tools. Graphical	user interface
X-windows. Computer networks. Local computer networks. Global computer networks. Addresses and protocols TCP/IP. Network configutation of a	computer. Networ	k services:
hardware sharing, mail, scp, etc. Network applications		
12VKT Vacuum Technology	KZ	4
Rarefied gasses: basic concepts and relations; diffusion,flow of rarefied gases. Flow and current of gas, conductivity. Interaction of gas with solid su	urface; sorption, de	sorption; gas
transport through solid matter; evaporation, condensation; Vacuum generation: Pumping proces, Ultimative pressure, Pumping speedPumps and the	ir properties:-Posi	tive displacement
pumps: Diaphragm, Sliding vane rotary, Diffusion, Molecular, Roots, Molecular and Turbomolecular pumps. Sorption pumps: Cryopumps, Cryo-Ads	orption pumps, Su	ublimation and
NEG pumps, Ion getter pumpsVacuum measurements: vacuum gauges of total and partial pressure; pumping speed; gas flow, search for leaks. N	Materials and vacu	um components
and seals.Practical exercises.		
12PYTH Scientific Programming in Python	Z	2
The aim of this course is to learn the fundamentals of the modern Python programming language with a focus on scientific computing. Emphasis is	placed on effective	solutions to real
problems. The course is performed in an interactive form of practical exercises, whose topics can be tailored to the content of other subjects or study		
involved in ongoing research. In the introductory part of the course, students learn the basic features of Python?from basic types to object oriented	or functional prog	ramming. The
greater part of the course focuses on specific features of Python for scientific programming. Presented are the main numerical libraries NumPy, Sci	iPy and the Matple	otlib graphics
library. We show how to generate efficient code, how to combine Python with other languages, what tools are available.		
12VTV Scientific and Technical Computing	Z	2
The students get familiar with methods of solving of computational problems in the scientific and technical practice, and with methods of their progr	ramming. The cour	se is oriented
mainly to programming in the Fortran language.		
18ZALG Basics of Algorithmization	Z,ZK	4
This course is devoted to selected algorithms and methods for algorithm design. This course intruduces selected methods for the determination of	the algorithm com	plexity.
17ZEL Basics of Electronics	KZ	3
Lectures provide basic information of electronics. In the beginning, lectures are devoted to passive components - resistors, capacitors, inductors are	nd solution of elect	rical circuits with
them. Next, lectures deal with semiconductor components (standard, Zener, capacitive, LED), bipolar, unipolar transistors and semiconductor components	ponents with more	layers (thyristors
and triacs). Lectures continue with general amplifiers and operational amplifiers. Finally, lectures deal with digital circuits, digital/analog and analog.	/digital converters.	Lectures are
completed with electronic laboratory exercises.		
02ZSM Introduction to the Standard Model	ZK	2
Particles, leptons, hadrons, baryons, mesons, symmetry, symmetry group, quarks, gluons, partons, standard model of electroweak and strong inter	ractions, quantum	chromodynamics
(QCD), cross section, scattering cross section.		
01ROZ1 Image Processing and Pattern Recognition 1	ZK	4
An introductory course on image processing and pattern recognition. Major attention is paid to image sampling and quantization, image preprocessing	(noise removal, co	ontrast stretching
sharpening, and de-blurring, Wiener filtering, blind deconvolution), edge detection, morphology and geometric transformations and warping. Numer	•	•
results are presented in addition to the theory.	• •	•
01ROZ2 Image Processing and Pattern Recognition 2	ZK	3
The course is a continuation of ROZ1. Major attention is paid to features for shape description and recognition, and to general pattern recognition to		_
and a series and a series and in addition to the theory.		

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

and experimental results are presented in addition to the theory.

Credits in the group: 0

Note on the g	roup:					
Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
04XAM1	English for Intermediate Students M1	Z	2	0+2	Z	V
04XAM2	English for Intermediate Students M2 V ra Šlechtová	Z	2	0+2	L	V
04XAM3	English for Intermediate Students M3 V ra Šlechtová	Z	2	0+2	Z	V
04XAP1	English for Advanced Students P1 V ra Šlechtová	Z	2	0+2	Z	V
04XAP2	English for Advanced Students P2 V ra Šlechtová	Z	2	0+2	L	V
04XAP3	English for Advanced Students P3 V ra Šlechtová	Z	2	0+2	Z	V
04XCESZ1	Czech for Foreigners - Beginners 1 Jana Ková ová Jana Ková ová (Gar.)	Z	2	0+2	Z	V
04XCESZ2	Czech for Foreigners - Beginners 2 Jana Ková ová Jana Ková ová (Gar.)	Z	2	0+2	L	V
04XCESZ3	Czech for Foreigners - Beginners 3 Jana Ková ová (Gar.)	Z	2	28	Z	V
04XCESM1	Czech for Foreigners - Intermediate 1	Z	2	0+2	Z	V
04XCESM2	Czech for Foreigners - Intermediate 2 Jana Ková ová Jana Ková ová (Gar.)	Z	2	0+2	L	V

04XCESM3	Czech for Foreigners - Intermediate 3 V ra Šlechtová Jana Ková ová (Gar.)	Z	2	0+2	Z	V
04XCESP1	Czech for Foreign Students - Advanced 1 Jana Ková ová Jana Ková ová (Gar.)	Z	2	0+2	Z	V
04XCESP2	Czech for Foreigners - Advanced 2 Jana Ková ová Jana Ková ová (Gar.)	Z	2	0+2	L	V
04XCESP3	Czech for Foreigners - Advanced 3 V ra Šlechtová Jana Ková ová (Gar.)	Z	2	0+2	Z	V
04XFM1	French for Intermediate Students M1 V ra Šlechtová V ra Šlechtová (Gar.)	Z	2	0+2	Z	V
04XFM2	French for Intermediate Students M2 V ra Šlechtová V ra Šlechtová (Gar.)	Z	2	0+2	L	V
04XFM3	French for Intermediate Students M3 V ra Šlechtová	Z	2	0+2	Z	V
04XFP1	French for Advanced Students P1 V ra Šlechtová V ra Šlechtová (Gar.)	Z	2	0+2	Z	V
04XFP2	French for Advanced Students P2 V ra Šlechtová V ra Šlechtová (Gar.)	Z	2	0+2	L	V
04XFP3	French for Advanded Students P3	Z	2	0+2	Z	V
04XFZ1	V ra Šlechtová French for Beginners Z1	Z	2	0+4	L	V
04XFZ2	V ra Šlechtová V ra Šlechtová (Gar.) French for Beginners Z2	Z	2	0+4	Z	V
04XFZ3	V ra Šlechtová V ra Šlechtová (Gar.) French for Beginnerş Z3	Z	2	0+4	L	V
04XFZ4	V ra Ślechtová V ra Ślechtová (Gar.) French for Beginners Z4	Z	2	0+4	Z	V
04XFZ5	V ra Šlechtová French for Beginners Z5	Z	2	0+4	L	V
04XNM2	V ra Šlechtová German for Intermediate Students M2	Z	2	0+2	L	V
	Miloslava echová Miloslava echová (Gar.) German for Intermediate Students M1		_		_	-
04XNM1	V ra Šlechtová Miloslava echová (Gar.) German for Intermediate Students M3	Z	2	0+2	Z	V
04XNM3	V ra Šlechtová German for Advanced Students P1	Z	2	0+2	Z	V
04XNP1	V ra Šlechtová 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 V ra Šlechtová	Z	2	0+2	Z	V
04XRM1	Russian for Intermediate Students M1 V ra Šlechtová Zhanna Isaeva (Gar.)	Z	2	0+2	Z	V
04XRM2	Russian for Intermediate Students M2 Zhanna Isaeva Zhanna Isaeva (Gar.)	Z	2	0+2	L	V
04XRM3	Russian for Intermediate Students M3 V ra Šlechtová	Z	2	0+2	Z	V
04XRP1	Russian for Advanced Students P1 V ra Šlechtová Zhanna Isaeva (Gar.)	Z	2	0+2	Z	V
04XRP2	Russian for Advanced Students P2 Zhanna Isaeva Zhanna Isaeva (Gar.)	Z	2	0+2	L	V
04XRP3	Russian for Advanced Students P3 V ra Šlechtová	Z	2	0+2	Z	V
04XRZ1	Russian for Beginners Z1 Zhanna Isaeva Zhanna Isaeva (Gar.)	Z	2	0+4	L	V
04XRZ2	Russian for Beginners Z2 V ra Šlechtová Zhanna Isaeva (Gar.)	Z	2	0+4	Z	V
04XRZ3	Russian for Beginners Z3 Zhanna Isaeva Zhanna Isaeva (Gar.)	Z	2	0+4	L	V
04XRZ4	Russian for Beginners Z4 V ra Šlechtová	Z	2	0+4	Z	V
04XRZ5	Russian for Beginners Z5 V ra Šlechtová	Z	2	0+4	L	V
04XSM1	Spanish for Intermediate Students M1	Z	2	0+2	Z	V
04XSM2	Beatriz Vadillo Gonzalo (Gar.) Spanish for Intermediate Students M3 Partie Vadillo Gonzalo (Gar.)	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	V ra Šlechtová Spanish for Advanced Students P1	Z	2	0+2	Z	V
04XSP2	V ra Šlechtová 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
U4AOF3	V ra Šlechtová			U+Z		_ v

	Spanish for Paginners 74				1	
04XSZ1	Spanish for Beginners Z1 Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)	Z	2	0+4	L	V
04XSZ2	Spanish for Beginners Students Z2 V ra Šlechtová Beatriz Vadillo Gonzalo (Gar.)	Z	2	0+4	Z	V
04XSZ3	Spanish for Beginners Z3 Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)	Z	2	0+4	L	V
04XSZ4	Spanish for Beginners Z4 V ra Šlechtová	Z	2	0+4	Z	V
04XSZ5	Spanish for Beginners Z5 V ra Šlechtová	Z	2	0+4	L	V
haracteristics of the	courses of this group of Study Plan: Code=BSPJAZYKYZAP N	Name=RS P i	azvky za	n		
	glish for Intermediate Students M1	tame=Bo i j	azyky za		Z	2
l l	tudents who have successfully completed the full secondary school English language	course at least at	the A2 leve	l of the Com	mon Europe	ean Framework
	(CEFR). It provides an introduction into English for Specific and Academic Purposes (\ensuremath{P}				•	
•	communication situations. Thus it covers topics related to the student's life and needs	as well as topics	of subtechi	nical interest	t. Attention i	s also paid to
`	grammar issues used in EAP.				7	
	glish for Intermediate Students M2 e student to have completed the AM1 course. It develops their skills for work with subte	chnical texts focu	isina also m	nore on spec	Z	2 ar functions
•	SP and EAP (e.g., definition, existence and classification of phenomena, object descripti		ū		•	
revision is included.		,		- g		, g
04XAM3 En	glish for Intermediate Students M3				Z	2
	Is that enable students to cope with features typical of professional style. Increasing atte	ntion is paid to de	veloping sul	otechnical vo	ocabulary ar	nd independent
• .	al texts. Great emphasis is placed on distinguishing different levels of formal and inform					
•	includes studying abstracts and rules for writing them as well as basic rules for prepar	ring and giving a	short preser	ntation on a	chosen topi	c related to the
student's field.	" I (A I					
ı	glish for Advanced Students P1	anuran (at lanat th	a D4 laval	of the Comm	Z	2
	students who have successfully completed the full secondary school English language - CEFR). It provides an introduction into English for Specific and Academic Purposes				-	
	f professional oral and written communication situations (fundamentals of terms in mat				•	
• • • • • • • • • • • • • • • • • • • •	written communication on topics related to the undergraduate's life and needs. It develop					
polite request). If necessary,	revision of selected grammar topics is included.					
04XAP2 En	glish 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 cho	sen branche	es of scienc	e. According to
	entrates on chosen grammar topics, but mainly intends to develop understanding of syn					
	ble, a case study). Increasing emphasis is placed on the undergraduate's independent		•			•
	lent's subtechnical vocabulary, and includes fundamental notions of chosen branches of cohesion and coherence in texts.	of science. It is loc	usea on ioi	mai wnung i	including the	e sentence and
	glish for Advanced Students P3				Z	2
-	AP2 and expects the student to work without any guidance with authentic professional i	materials and to ir	nterpret the	l text. It includ	_	_
	nctions (e.g., expressing an opinion, agreement, and objections; taking part in discussion					
also preparing a project on a	a given or chosen topic and presenting it. The course places emphasis on distinguishin	g levels of formal	and informa	al language	both in oral	and written
communication.						
	ech for Foreigners - Beginners 1				Z	2
•	tudents on the English programme. Students will become acquainted with the main cha		**	•		
	speaking skills. The course focuses on pronounciation exercises, simple social phrase: ne course covers roughly lessons 1-5 in "Chcete mluvit esky" by H. Remediosová and l	•				
A1 (CEFR) approximately.	te course covers roughly lessons 1-5 iii "Cricete filluvit" esky by H. Reffiediosova and i	E. echova. At the	e ena or me	course, trie	Students wi	ii nave reached
	ech for Foreigners - Beginners 2				Z	2
	cation competences acquired in CESZ1 are further developed. Students extend their kn	nowledge of Czec	h declensio	n and coniud	1	
	opics. The course covers roughly lessons 6-10 in "Chcete mluvit esky" by H. Remedio					
have reached A2 (CEFR) ap	proximately.					
04XCESZ3 Cz	ech for Foreigners - Beginners 3				Z	2
•	the language and communication competences acquired in the XCESZ1 and XCESZ2		•		· .	•
	ening grammar, including grammar practice, and introducing Czech culture. Students a					
	se understanding texts in terms of main ideas or looking for specific details in texts. The	e course covers re	oughly less	ons 5-7 in "		
	ech for Foreigners - Intermediate 1				Z	2
	rect pronunciation, important morphological phenomena, prepositional phrases, and ve	rb forms as well a	s on extend	ing the stude	ent s vocabu	llary for various
social situations. 04XCESM2 Cz	ech for Foreigners - Intermediate 2			<u> </u>	Z	2
	ech for Foreigners - Intermediate 2 pics covered in CESM1 and is then focused on more difficult grammar phenomena. It p	ractices writing s	peaking an	d reading sk	I	
	bbreviations, abbreviated words, and mathematical terms and formulas.	ooo willing, 5	rouning, all	rodding Sr	and and trail	and staubill
	ech for Foreigners - Intermediate 3				Z	2
ı	phological topics covered earlier and extends the student's knowledge of more difficult	language phenor	mena. It is e	ا especially foo	_	_
lexicology and on developing	· · · · · · · · · · · · · · · · · · ·					
04XCESP1 Cz	ech for Foreign Students - Advanced 1				Z	2
The prerequisite of the cours	se is very good knowledge of the Czech language, i.e., communicative competences at l					
	on of standard language structures, but mainly on practising more complex grammatica					
	engineering and professional communication, both in spoken and written form. The top	ics include Univer	sity Studies	and Studer	nt Life. Writte	en practice
	n teachers and faculty administrators.			-		
	ech for Foreigners - Advanced 2				Z	2
	dent's knowledge acquired in CESP1 and focuses on difficult language phenomena. It	practises working	with techni	cal and spe	cialist texts	placing greater
emphasis on individual work	.					

emphasis on individual work.

04XCESP3	Czech for Foreigners - Advanced 3	Z	2
•	e student's knowledge from CESP2. It includes working with authentic specialist materials, their interpretation and presentation	n, and, finally, pr	esentation of the
	g skills necessary for professional communication are trained.		_
04XFM1	French for Intermediate Students M1	Z	2
	M The objective of this three-semester course is to improve and further develop communication in the French language in bot cate in social interaction and in academic, scientific and professional environment. They will be able to use the language to tr		
	problems. FM1 The course builds on and further develops linguistic competence acquired at secondary school. It revises, sy	•	
	study. The following topics are covered: University studies in our country and in France, writing of transactional letters, CV, per	-	
to an advert, French cul	ture and geography, Paris. Topics of specialization: mathematics, physics. Reading technical and popular science texts, work	based on these t	exts.
04XFM2	French for Intermediate Students M2	Z	2
	M1. Linguistic structures and competence acquired in previous study are systemized and expanded. Reading popular science		
	(passives, nominalization, word formation). Topics: physics, power engineering, environment, Internet, success of French scie	ence and technologic	ogy, French
	chitects. Description of an object, device, shapes, dimensions, material.	Z	2
04XFM3	French for Intermediate Students M3 n improvement and further development of linguistic competence acquired during the follow-up courses. Syntactic structures (s	_	
	npound tenses). Text summaryStudents prepare a written paper which will be delivered in form of an oral presentation in-cl		
field of students' future	specialisation or to their interest and generally covers a technical /applied science topic. It is not a translation but a creative w	ork compiled from	n French articles
and one's own knowled	ge/experienceLonger monologues on topics /situations set for the examination are prepared. Text structure, cohesion and c	oherence.	
04XFP1	French for Advanced Students P1	Z	2
	e objective of this three-semester course is to improve and further develop communication in the French language in both wr		
	in social interaction and in academic, scientific and work environment. They will be able to use the language to transmit gene The course builds on and further develops linguistic competence acquired at secondary school. Difficult grammar topics are re		
·	it, pronouns. The following specific topics are covered: University studies in our country and in France, writing of transactiona		
	lvert, environmental issues, success of French science and technology, chosen topics from French regional culture, Paris. Topi	=	
internet, physics, chemi-	stry. Reading of technical and popular science texts, further work with these texts and interpretation.		
04XFP2	French for Advanced Students P2	Z	2
	ents, the course further develops language skills. Focus is put on reading popular science texts and on oral communication or	n given topics. Fe	atures typical of
	communication are stressed (passive voice, nominalization, word formation).	7	
04XFP3	French for Advanded Students P3 n systemization and improvement of acquired linguistic competence, skills and knowledge, and their use for communication in	Z onginooring onvi	2
	ter texts (both from and into the language). Writing of a paper and making oral presentation in-class. The paper generally cov		
	k compiled from 3 French sources. Preparation of several set topics for oral examination.		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
04XFZ1	French for Beginners Z1	Z	2
French for beginners Th	e objective of this 5-level course is to be able to communicate in French orally and in writing in situations of everyday life, in s	ocializing and in	professional life.
	nch for specific / technical communication and reading of popular science and scientific texts. FZ1 The objective is to be able		
· -	knowledge of chosen elementary language. The contents is roughly outlined by lessons 1 - 7 of the textbook Pravda - Pravdo te ky). It is extended with situations of communication and functions from the textbook Espaces I, lessons 1-4 : introductions,		-
	pple instructions and questions. Special attention is paid to pronunciation. Spelling is explained in connection with pronunciation.	-	- 1
	French for Beginners Z2	Z	2
-	with FZ1. Elementary linguistic knowledge and communication skills are expanded. The scope is given by lessons 8 - 13 of t	_	
French for Beginners . A	dditional topics and skills are filled in from the textbook Espaces I, lesson 1 - 5 (introductions, invitation, welcoming, agreement	ent - disagreeme	nt, apology,
	of France, food, expression of will, wish, order, prohibition, pleasure). Correct pronunciation is practiced. Stress on oral commi	unication. Specific	c topics covered:
	work? A few expressions concerning the study. Name of University and Faculty.	7	0
04XFZ3	French for Beginners Z3 FZ2. Basic linguistic knowledge and skills are developed. The contents is given by lessons 14 - 18 of the textbook: Pravda - P	Z ravdová: Franch	2 for Boginnors
•	uations are complemented from other materials. Stress is put on oral communication in dialogues and on reading, both for in		-
•	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 c	ontents is roughly	covered with
	ktbook French for Beginners, and is expanded with topics and functions from other materials. Reading is developed from the lec		
	burse covers generals and specific topics: health- illness, sport, free time, environment, study, travelling in France, Paris, shop	pping, weather, u	niversity in our
04XFZ5	ow to write CV, application, topics in mathematics, reading physics - mechanics, informatics, internet.	Z	2
	French for Beginners Z5 Fz4 are further developed, as well as technical language. Students prepare a paper on a chosen popular science topic. They		in the class. The
•	pred by lessons 24 - 26 of the textbook: Pravda-Pravdova, French for Beginners, and is complemented from other materials.	-	
•	h science and technology, information about France. Grammar is systemized and complemented with syntax (subordinate cla		
subjunctive clauses, ger	und, passive.		
04XNM2	German for Intermediate Students M2	Z	2
	ther more complex grammatical structures and their application in communication based on technical texts, such as the relation		
-	ng of the 21st century, linguistically more demanding texts on the environment, the language of mathematics, computers and mation and reading aloud, and appropriate language for various purposes in oral and written communication. The course system		
•	or professional discourse (participles, relative clauses).	idilodily forlood o	aror grammatioa
04XNM1	German for Intermediate Students M1	Z	2
	rse is to level off the students' skills in the German language. The course focuses on revision of more difficult phenomena and	structures (e.g.	the passive) and
•	es (e.g. importance of verb prefixes). In the lexical part, it covers topics referring to higher education in both the Czech Repub	-	
	gether with all necessary expressions and phrases, expressions and phrases needed to chemists, mathematicians, physicist	s, and the fundar	nentals of IT
	communication on related topics and is aimed at correct pronunciation, grammatical correctness and understandability. Correct pronunciation, grammatical correctness and understandability.	7	2
04XNM3 The course introduces of	German for Intermediate Students M3 ther more complex grammatical structures and their application in communication based on technical texts, such as the relation	Z between techno	2 logy and society
	ng of the 21st century, linguistically more demanding texts on the environment, the language of mathematics, computers and		
-	mation and reading aloud, and appropriate language for various purposes in oral and written communication. The course system		
phenomena important for	or professional discourse (participles, relative clauses).		

04XNP1			
· ·	German for Advanced Students P1	Z	2
· -	ed grammar knowledge, extended general vocabulary, and good communication skills acquired at secondary school to be leven focused on working with technical and scientific texts and practising reading techniques (skimming, scanning, reading for		
	ructures necessary for understanding a subtechnical text (passive voice, participles, participle structures) and it also focuses on participles.	•	
i.e., telephoning.			
04XNP2	German for Advanced Students P2	Z	2
•	students' skills in working with professional scientific texts (understanding, summarising, note-taking, interpreting) while extend		
· -	duces mathematical expressions and texts of nuclear power engineering. Increasing emphasis is placed on understanding and /, letter of application, interview, scholarship), and more complex grammatical structures (i.e., subjunctive, indirect speech).	i practising formai	communication,
04XNP3	German for Advanced Students P3	Z	2
	main parts (general communicative situations, grammar and technical topics). Students will develop their vocabulary in a va		
	accidents, accident report, filling in a form, complaints). Based on presentations and technical and subtechnical texts, the volume of the complaints of the		
	ng, the environment, computer science, and car technology, will also be extended. Only authentic professional texts are used		
students are trained to p practice to and from Ger	ocess information gained from their reading of complex and difficult texts and present it to the class in a simplified oral form. The	ne course also incl	ludes translation
04XRM1	Russian for Intermediate Students M1	Z	2
ı	or students with previous knowledge of Russian from secondary schools. Students are supposed to know the Russian alphab	_	
-	munication in everyday situations (introductions, socializing, greetings, shopping for food and objects of everyday need, aski		
•	mar structures (verbal and nominal forms, irregular verbs, pronouns). The initial knowledge corresponds to the achievement	level of the RZ2 of	course. The
	e 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
04XRM3	the RM1 course, its contents and scope correspond roughly to RZ4, however, for half of the time allotted in the timetable. Russian for Intermediate Students M3	Z	2
	knowledge and skills acquired in RM1 and RM2 and its contents and scope are roughly at the same level as those of RZ5, he	_	
in the timetable.	tatomodge and dame adquired in tank and tank and to contonic and deepe are roughly at the same foreign as these of the same	owover, for flair of	
04XRP1	Russian for Advanced Students P1	Z	2
The entrance requireme	nt for the course is to achieve the B1 CEFR level. The objective of the course is revision of standard language structures, pra	acticing more diffic	cult grammar
	g the fundamentals of technical language and training writing skills.		
04XRP2	Russian for Advanced Students P2	Z	2
	RP1. It expands grammatical structures important for understanding technical texts (verbal adjectives, participles, passives,	verb aspects, spe	cific syntactic
	on independent oral and written communication. Russian for Advanced Students P3	7	2
ı	RP2 and is mainly focused on working with technical and scientific texts (reading comprehension, oral and written paraphras	_	
	evious knowledge of general language at secondary level (listening, reading, correct communication in everyday situations).	-	
	y is aimed at professional and technical skills (reading technical literature according to the students' specialization, oral and	-	
•	al vocabulary and practice quick and correct communication in professional situations. They will be able to both speak write a	accurately and wit	h confidence on
technical topics. 04XRZ1	Russian for Beginners Z1	7	
- 1	Russian for Deginners 21		
•	ne first stage of the five-semester programme, its final aim being reading and understanding professional texts written in Russ	_	2 s with mastering
	ne first stage of the five-semester programme, its final aim being reading and understanding professional texts written in Russ r both reading and writing skills) and fundamentals of grammar necessary for everyday communication (listening and speak	ian. Thus it begin	s with mastering
a short text with marked		ian. Thus it begin	s with mastering
04XRZ2	r both reading and writing skills) and fundamentals of grammar necessary for everyday communication (listening and speak stress, understand its contents and summarize it. Russian for Beginners Z2	sian. Thus it begin ing). Students will Z	s with mastering be able to read
04XRZ2 The second semester of	r both reading and writing skills) and fundamentals of grammar necessary for everyday communication (listening and speak stress, understand its contents and summarize it. Russian for Beginners Z2 the programme is designed to teach skills for basic communication in everyday situations and for reading easy and short su	sian. Thus it begin: ing). Students will Z ubtechnical texts.	s with mastering be able to read 2 Students will be
04XRZ2 The second semester of able to communicate us	r both reading and writing skills) and fundamentals of grammar necessary for everyday communication (listening and speak stress, understand its contents and summarize it. Russian for Beginners Z2 the programme is designed to teach skills for basic communication in everyday situations and for reading easy and short sung short sentences and appropriate structures, and read aloud with confidence a short text without marked stress. They will	sian. Thus it begin: ing). Students will Z ubtechnical texts.	s with mastering be able to read 2 Students will be
04XRZ2 The second semester of able to communicate us master further grammati	r both reading and writing skills) and fundamentals of grammar necessary for everyday communication (listening and speak stress, understand its contents and summarize it. Russian for Beginners Z2 the programme is designed to teach skills for basic communication in everyday situations and for reading easy and short sung short sentences and appropriate structures, and read aloud with confidence a short text without marked stress. They will cal structures. They will have mastered with confidence the Russian alphabet and will be able to use it in writing.	sian. Thus it beginding). Students will Z ubtechnical texts. \$ also develop their	s with mastering be able to read 2 Students will be vocabulary and
04XRZ2 The second semester of able to communicate us master further grammati 04XRZ3	r both reading and writing skills) and fundamentals of grammar necessary for everyday communication (listening and speak stress, understand its contents and summarize it. Russian for Beginners Z2 the programme is designed to teach skills for basic communication in everyday situations and for reading easy and short sung short sentences and appropriate structures, and read aloud with confidence a short text without marked stress. They will	sian. Thus it beginding). Students will Z ubtechnical texts. \$ also develop their	s with mastering be able to read 2 Students will be vocabulary and
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04XRZ2 The second semester of able to communicate us master further grammati 04XRZ3 The course is based on and listening) and introdunderstood, and to expr	r both reading and writing skills) and fundamentals of grammar necessary for everyday communication (listening and speak stress, understand its contents and summarize it. Russian for Beginners Z2 the programme is designed to teach skills for basic communication in everyday situations and for reading easy and short sums short sentences and appropriate structures, and read aloud with confidence a short text without marked stress. They will cal structures. They will have mastered with confidence the Russian alphabet and will be able to use it in writing. Russian for Beginners Z3 RZ2 and includes further everyday topics, develops understanding of short compact texts on new subtechnical topics (for train ucces new grammar. Students will be trained to distinguish intonation patterns while listening to spoken language. They will be set their opinion. Writing skills will be trained on guided writing tasks and note-taking.	sian. Thus it beginsing). Students will Z ubtechnical texts. Salso develop their Z ning various forms e able to respond	s with mastering be able to read 2 Students will be vocabulary and 2 of reading skills so as to be
04XRZ2 The second semester of able to communicate us master further grammati 04XRZ3 The course is based on and listening) and introdunderstood, and to expr	r both reading and writing skills) and fundamentals of grammar necessary for everyday communication (listening and speak stress, understand its contents and summarize it. Russian for Beginners Z2 the programme is designed to teach skills for basic communication in everyday situations and for reading easy and short sums short sentences and appropriate structures, and read aloud with confidence a short text without marked stress. They will cal structures. They will have mastered with confidence the Russian alphabet and will be able to use it in writing. Russian for Beginners Z3 RZ2 and includes further everyday topics, develops understanding of short compact texts on new subtechnical topics (for train ucces new grammar. Students will be trained to distinguish intonation patterns while listening to spoken language. They will be sest their opinion. Writing skills will be trained on guided writing tasks and note-taking. Russian for Beginners Z4	sian. Thus it beginsing). Students will Z ubtechnical texts. Salso develop their Z ning various forms e able to respond	s with mastering be able to read 2 Students will be vocabulary and 2 of reading skills so as to be
04XRZ2 The second semester of able to communicate us master further grammati 04XRZ3 The course is based on and listening) and introdunderstood, and to expr 04XRZ4 The course is based on the course is based	r both reading and writing skills) and fundamentals of grammar necessary for everyday communication (listening and speak stress, understand its contents and summarize it. Russian for Beginners Z2 the programme is designed to teach skills for basic communication in everyday situations and for reading easy and short sure and short sentences and appropriate structures, and read aloud with confidence a short text without marked stress. They will cal structures. They will have mastered with confidence the Russian alphabet and will be able to use it in writing. Russian for Beginners Z3 RZ2 and includes further everyday topics, develops understanding of short compact texts on new subtechnical topics (for train ucces new grammar. Students will be trained to distinguish intonation patterns while listening to spoken language. They will be sess their opinion. Writing skills will be trained on guided writing tasks and note-taking. Russian for Beginners Z4 RZ3. It improves and expands the knowledge of general language in all four skills (reading and understanding longer texts with	sian. Thus it beginsing). Students will Z ubtechnical texts. Salso develop their Z ning various forms e able to respond Z a certain percenta	s with mastering be able to read 2 Students will be vocabulary and 2 of reading skills so as to be 2 age of unfamiliar
04XRZ2 The second semester of able to communicate us master further grammati 04XRZ3 The course is based on and listening) and introdunderstood, and to expr 04XRZ4 The course is based on lawords, oral communications	r both reading and writing skills) and fundamentals of grammar necessary for everyday communication (listening and speak stress, understand its contents and summarize it. Russian for Beginners Z2 the programme is designed to teach skills for basic communication in everyday situations and for reading easy and short sums short sentences and appropriate structures, and read aloud with confidence a short text without marked stress. They will cal structures. They will have mastered with confidence the Russian alphabet and will be able to use it in writing. Russian for Beginners Z3 RZ2 and includes further everyday topics, develops understanding of short compact texts on new subtechnical topics (for train ucces new grammar. Students will be trained to distinguish intonation patterns while listening to spoken language. They will be ass their opinion. Writing skills will be trained on guided writing tasks and note-taking. Russian for Beginners Z4 RZ3. It improves and expands the knowledge of general language in all four skills (reading and understanding longer texts with on in everyday situations, writing longer texts). Students are trained to use grammar structures effectively (e.g., irregular vertical stress and structures effectively (e.g., irregular vertical structures effectively effectively effectively effectively effectively effectively effectively effectively effectively effective	sian. Thus it beginsing). Students will Z ubtechnical texts. Salso develop their Z ning various forms e able to respond Z a certain percentabs, differences in	s with mastering be able to read 2 Students will be vocabulary and 2 of reading skills so as to be 2 age of unfamiliar verb patterns
04XRZ2 The second semester of able to communicate us master further grammati 04XRZ3 The course is based on and listening) and introdunderstood, and to expr 04XRZ4 The course is based on lowerds, oral communicate from Czech, modality, im	r both reading and writing skills) and fundamentals of grammar necessary for everyday communication (listening and speak stress, understand its contents and summarize it. Russian for Beginners Z2 the programme is designed to teach skills for basic communication in everyday situations and for reading easy and short sure and short sentences and appropriate structures, and read aloud with confidence a short text without marked stress. They will cal structures. They will have mastered with confidence the Russian alphabet and will be able to use it in writing. Russian for Beginners Z3 RZ2 and includes further everyday topics, develops understanding of short compact texts on new subtechnical topics (for train ucces new grammar. Students will be trained to distinguish intonation patterns while listening to spoken language. They will be sess their opinion. Writing skills will be trained on guided writing tasks and note-taking. Russian for Beginners Z4 RZ3. It improves and expands the knowledge of general language in all four skills (reading and understanding longer texts with	sian. Thus it beginsing). Students will Z ubtechnical texts. Salso develop their Z ning various forms e able to respond Z a certain percentabs, differences in and practice oral a	s with mastering be able to read 2 Students will be vocabulary and 2 of reading skills so as to be 2 age of unfamiliar verb patterns and written
04XRZ2 The second semester of able to communicate us master further grammati 04XRZ3 The course is based on and listening) and introdunderstood, and to expr 04XRZ4 The course is based on lowords, oral communicating from Czech, modality, in communication on more	r both reading and writing skills) and fundamentals of grammar necessary for everyday communication (listening and speak stress, understand its contents and summarize it. Russian for Beginners Z2 the programme is designed to teach skills for basic communication in everyday situations and for reading easy and short sure and short sentences and appropriate structures, and read aloud with confidence a short text without marked stress. They will cal structures. They will have mastered with confidence the Russian alphabet and will be able to use it in writing. Russian for Beginners Z3 RZ2 and includes further everyday topics, develops understanding of short compact texts on new subtechnical topics (for train ucces new grammar. Students will be trained to distinguish intonation patterns while listening to spoken language. They will be set their opinion. Writing skills will be trained on guided writing tasks and note-taking. Russian for Beginners Z4 RZ3. It improves and expands the knowledge of general language in all four skills (reading and understanding longer texts with on in everyday situations, writing longer texts). Students are trained to use grammar structures effectively (e.g., irregular vert peratives, conditionals). They practice and develop communication skills for everyday situations (food, travelling, free time), as	sian. Thus it beginsing). Students will Z ubtechnical texts. Salso develop their Z ning various forms e able to respond Z a certain percentabs, differences in and practice oral a	s with mastering be able to read 2 Students will be vocabulary and 2 of reading skills so as to be 2 age of unfamiliar verb patterns and written
04XRZ2 The second semester of able to communicate us master further grammati 04XRZ3 The course is based on and listening) and introdunderstood, and to expr 04XRZ4 The course is based on words, oral communicati from Czech, modality, in communication on more forms, look up the inform 04XRZ5	r both reading and writing skills) and fundamentals of grammar necessary for everyday communication (listening and speak stress, understand its contents and summarize it. Russian for Beginners Z2 the programme is designed to teach skills for basic communication in everyday situations and for reading easy and short summary short sentences and appropriate structures, and read aloud with confidence a short text without marked stress. They will call structures. They will have mastered with confidence the Russian alphabet and will be able to use it in writing. Russian for Beginners Z3 RZ2 and includes further everyday topics, develops understanding of short compact texts on new subtechnical topics (for train uces new grammar. Students will be trained to distinguish intonation patterns while listening to spoken language. They will be sest their opinion. Writing skills will be trained on guided writing tasks and note-taking. Russian for Beginners Z4 RZ3. It improves and expands the knowledge of general language in all four skills (reading and understanding longer texts with on in everyday situations, writing longer texts). Students are trained to use grammar structures effectively (e.g., irregular vert peratives, conditionals). They practice and develop communication skills for everyday situations (food, travelling, free time), a specific topics (environment, addictions, the green movement). They become acquainted with various geographical data (e.g. tation from the timetable, learn about Russian holidays and typical meals. Russian for Beginners Z5	sian. Thus it beginsing). Students will Z ubtechnical texts. Salso develop their Z ning various forms e able to respond Z a certain percentabs, differences in and practice oral ag., Siberia), learn	s with mastering be able to read 2 Students will be vocabulary and 2 of reading skills so as to be 2 age of unfamiliar verb patterns and written how to fill in
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04XSP1	Spanish for Advanced Students P1	Z	2
Course concentrates of	n ore difficult grammar topics, revision of vocabulary, basics of Spanish for specific purposes as well as written communicat	ion. Course prere	quisites: level B2
of CEFR.			
04XSP2	Spanish for Advanced Students P2	Z	2
Course SP2 is the sec	ond part of the advanced Spanish course, extending Spanish for specific purposes topics. It comprises more grammar and sy	ntax and focuses	on independent
written communication			
04XSP3	Spanish for Advanced Students P3	Z	2
Course SP3 is the fina	part of the advanced Spanish course. It is based on texts chosen by the students according to their future specialization. It is	focused on writter	n communication
based on what student	s will need in their career.		
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 fundan	nental grammar st	ructures and will
be able to communicat	e at an elementary level on topics of everyday life. They will acquire and extend fundamental vocabulary of general Spanish a	ınd will develop it.	
04XSZ2	Spanish for Beginners Students Z2	Z	2
Course SZ2 is based o	n course SZ1, and expects students to develop and extend the knowledge and skills acquired so far. Grammar structures and I	exis will be chose	n so as to enable
them to understand sh	ort adapted written texts and speech. Attention is also paid to cultural differences between Spanish-speaking countries and o	thers such as the	Czech Republic.
Realia of Spanish-spea	aking countries are also included.		
04XSZ3	Spanish for Beginners Z3	Z	2
The course is based or	n course SZ2, and develops the student's vocabulary and grammar structure. The course covers realia (history and culture) o	f the Spanish-spe	aking countries,
mainly of Spain. It pays	s attention to further grammar topics (pretérito perfecto, pretérito indefinido, pretérito imperfecto, the gerund and the imperativ	e). It includes writ	ten and oral
communication on a gi	ven 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 or	n course SZ3. It develops the student's vocabulary and extends the knowledge of the culture and social customs of the Spani	sh speaking coun	tries, mainly of
Spain. It pays attention	to further grammar topics (perifrasis verbales, futuro imperfecto, direct object and indirect object pronouns, negative form of	the imperative, ar	id subjunctive),
to written and oral com	munication on a given general or subtechnical topic, for which the student is trained by reading texts or listening to them.		
04XSZ5	Spanish for Beginners Z5	Z	2
The course books are	supplemented with additional subtechnical materials, so the students will be gradually acquainted with peculiarities of Spanis	h for specific purp	oses. In its final
part, the general Span	sh course based on the course book will end with presentations and, finally, a written and oral examination.		

List of courses of this pass:

Code	Name of the course	Completion	Credits
00EKOT	Economy in Technology 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	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 nonverbal aspects. Stylistics exercises, strategies for coping with stage-fright and a short excursion into the history of rhetoric are are		•
00UPRA	Introduction to Law	Z	1
00UPSY	Introduction to Psychology	Z	1
01ANB3	Calculus B 3	Z,ZK	8
of set, completenes	ntial equation). 3. Metric spaces - metric, norm, scalar product, neighborhood, interior and exterior points, boundary point, isolated an ss of space, Hilbert spaces. Orthogonal polynomials. Complete orthogonal systems. 4. Fourier series - expansion of functions into Fouri onvergence. 5. Differential calculus of functions of several variables - limit, continuity, partial and directional derivative, gradient, total or Taylor series, elementary terms of vector analysis, Jacobi matrix. 6. Functions defined implicitly by one or several equation	er series, trigonom derivatives and tan	etric Fourie
01ANB4	Calculus B 4	Z.ZK	6
[1] Diferenciální p prom nných, ne	po et funkcí více prom nných a funkcionálních vektor . [2] Funkce zadané implicitn . [3] Taylorovy ady funkce více prom nných. [4] lekartézské soustavy sou adnic. [5] Lokální, vázané a globální extrémy funkce více prom nných. [6] Základy teorie míry a obrys konst funkce 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.	Regulární zobrazer rukce Lebesgueovy	ní, zám na / míry. [7]
01FKO	Functions of Complex Variable	Z,ZK	3
The course starts for a complex function	rom outlining the Jordan curve theorem and the Riemann-Stieltjes integral. Then basic results of complex analysis in one variable are exion and the Cauchy-Riemann equations, holomorphic and analytic functions, the index of a point with respect to a closed curve, Cauch holomorphic function, analytic continuation, isolated singularities, the maximum modulus principle, Liouville's theorem, the Cauchy est theorem.	xplained in detail: th hy's integral theore	e derivative m, Morera's
01LAL	Linear Algebra 1	Z	2
1. Vector space. 2	2. Linear dependence and independence. 3. Basis and dimension. 4. Subspaces of vector spaces. 5. Linear mappings. 6. Matrices of l	linear mappings. 7.	Frobenius

01LAL2	Linear Algebra 2	Z,ZK	4
	se matrix and operator. 2. Permutation and determinant. 3. Spectral theory (eigenvalue, eigenvector, diagonalization). 4. Hermitian and onality. 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.	,	
01LALZ	Linear Algebra 1, exam	ZK	2
01MAN	Calculus 1	Z	4
	Basic calculus (real analysis, functions of one real variable, differential calculus).		
01MAN2	Calculus 2	Z,ZK	8
	differential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergence, operations on series, absolute ar bower series, the Cauchy-Hadamard theorem, expansion of function into power series, summation of infinite series. 4. Theory of integr		٠ ا
rtear and complex p	(Riemann definition), techniques of integration and application of integrals, Generalized Riemann integral	aio. primitiveo, aen	into intograi
01MANZ	Calculus 1, exam	ZK	4
01NME2	Numerical Methods 2	KZ	2
The course is devot	ed to numerical solution of boundary-value problems and intial-boundary-value problems for ordinary and partial differential equations.	It explains method:	s converting
	dary-value problems to initial-value problems and finite-difference methods for elliptic, parabolic and first-order hyperbolic partial difference methods for elliptic, parabolic and first-order hyperbolic partial difference		
01PRST	Probability and Statistics	Z,ZK	4
	e of probability theory and mathematical statistics. The probability theory is build gradually beginning with the classical definition and or probability theory is build gradually beginning with the classical definition and or probability theory is as random variable, distribution function of random variable are treated and basic limit the	-	-
	e basis of this theory the basic methods of mathematical statistics such as estimation of distribution parameters and hypothesis testing		and provou.
01RMAF	Equations of Mathematical Physics	Z,ZK	7
The subject of this	course is solving integral equations, theory of generalized functions, classification of partial differential equations, theory of integral tr	ansformations, and	d solution of
	partial differential equations (boundary value problem for eliptic PDE, mixed boundary problem for eliptic PDE).		
01ROZ1	Image Processing and Pattern Recognition 1	ZK	4
-	rse on image processing and pattern recognition. Major attention is paid to image sampling and quantization, image preprocessing (nois e-blurring, Wiener filtering, blind deconvolution), edge detection, morphology and geometric transformations and warping. Numerous		- 1
Sharpening, and de	results are presented in addition to the theory.	applications and ea	Aperimental
01ROZ2	Image Processing and Pattern Recognition 2	ZK	3
	ntinuation of ROZ1. Major attention is paid to features for shape description and recognition, and to general pattern recognition techn	iques. Numerous a	applications
	and experimental results are presented in addition to the theory.		
01UP1	Introduction to Probability 1	Z,ZK	3
	ith finite set of possible results, classical probability, independent random events 2.Probability and combinatorics 3.Probability and ge pability, Bayes' theorem, medical diagnosis, Simpson's paradox 5.Random variable with discrete state space, its distribution and mea	•	
4.Conditional proc	the calculation of mean value 7.Probabilistic method in graph theory 8.Random algorithms, Morris algorithm and its variant		3 involving
01UP2	Introduction to Probability 2	Z,ZK	3
1. One-dimensiona	l continuous random variable and its statistical description. 2. Distribution function and probability density. 3. Axiomatic introduction of	probability and co	nnection to
measure theory. 4.	Numerical characteristics of continuous random variables. 5. Selected variants of continuous distributions and their characteristics. 6.	Elementary metho	ods for point
02BPJC1	estimations. 7. Generating pseudorandom numbers from the selected distribution.	7	
	Bachelor Project 1 chelor project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guid	_	5 supervisor
Abstract. The bac	during common regular meetings and discussions.	ca by the project s	Jupel Visoi
02BPJC2	Bachelor Project 2	Z	10
	chelor project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guid		supervisor
	during common regular meetings and discussions.	_	
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 Archimed. Arabic science, European science in Middle Ages. Renaissance - da Vinci, Giordano Bruno. Copernicus, Kepler, Galileo, F	•	,
riciciiistic period,	as experimental science. Newton and his work.	laygens. The birth	or priyates
02DEF2	History of Physics 2	Z	2
Development of	f classical mechanics after Newton, Bernoulli's, Euler, Lagrange. Historical development of optics, corpuscular and wave approach. E	lectricity and magr	netism -
-	ranism, electrodynamics and electromagnetism, Faraday and Maxwell. Thermodynamics and its laws, statistical physics, Boltzmann.		-
and relativistic p	hysics, Planck and Einstein. Discovery of radioaktivity, structure of atom, atomic nucleus, Rutherford and Bohr. The way to nuclear er standard model. The concept of Nature and Universe of today.	ergy, Elementary p	particles,
02DPD1	Detectors and Principles of Detection 1	ZK	2
	res introduce the main forms of interaction of some particles with matter. The goal is that the student gets an overview of what type of		
	in which situations they may be dominant. Some applications to Medicine and to study the fundamental structure of matter are pre-	sented.	
02DPD2	Detectors and Principles of Detection 2	ZK	4
Abstract: The le	ctures introduce the main ideas needed to understand how detector systems work. It will be focused on gaseous detecting principles	, scintilating princip	ples and
02ELMA	semiconductor detecting principles. Basic information about various detector constructions is provided.	Z,ZK	6
	Electricity and Magnetism pulomb's law, electrostatic field, Gauss' law. Electric dipole, polarization. Conductors anddielectrics. Electric current and circuits, cond		
	Electrodynamic forces,magnetic field. Magnetic dipole, magnetics. Electromagnetic induction, ac currents. Electromagnetic waves,M	=	
02EXF	Experimental Physics	ZK	2
The goal of this sub	eject is to introduce the students the principles of physics measurements, their techniques, methods and instruments that are used for	such measureme	nts, and the
005704	analysis of measured data.	7	
02FYS1	Physical Seminar 1 levoted to detailed study of interesting physical problems. It should help students to deeper understanding of fundamentals of physics	Z s presented in the (2
	revoted to detailed study of interesting physical problems. It should help students to deeper understanding of fundamentals of physical Inics. The problems are chosen, studied and presented by the students themselves, with the possibility to use PC and physical labora	-	oouise UI
02KM1	Quantum Mechanics 1	Z,ZK	6
	e describes the birth of quantum mechanics and description of one particle and more particles by elements of the Hilbert space as we	,	on. Besides
	that it includes description of observable quantities by operators in the Hilbert space and calculation of their spectra.		

	Quantum Mechanics 2	Z,ZK	6
	ture expands the introduction to quantum mechanics with more general formalism of quantum theory, approximate methods and path	_	
terminology and m	ethods used in various applications of quantum mechanics and prepares the students for an effective scientific research and further stu	ıdy, in particular, o	f the modern
	formulations of quantum field theory.		
02MECH	Mechanics	Z	4
	ics, physical quantities and units. Particle kinematics, basic types of motion and theirsuperposition. Particle dynamics, one-dimension	•	
in central force i	leld, forces innoninertial reference frames. Mechanics of system of free particles, two-body problem, collisions. Mechanics of significant forces innoninertial reference frames. Mechanics of system of free particles, two-body problem, collisions. Mechanics of significant forces innoninertial reference frames.	y, rotation. Fundai	mentals of
O2MECH7		ZK	2
02MECHZ	Mechanics - Examination The content of the subject is the examination according to the plan of studies.	ZN	-
02NSAD1		Z	2
UZNSADT	Simulations and Data Analysis Tools 1 Data analysis and simulations of high energy elementary particle collisions. ROOT and Pythia programs.		-
00NICAD0		7	
02NSAD2	Simulations and Data Analysis Tools 2	Z	2
000004	Individual work will include implementation and testing of a program for generating of particle collision. Results are reviewed		
02PRA1	Experimental Laboratory 1	KZ	6
	d especially for students who intend to study some of the physical specializations of FNSPE(branch Physical Engineering, Nuclear Ei ts interested in the otherspecializations. In Experimental laboratory students learn how to prepare for experiments (including work with th		
=	nt (acquire of different experimental procedures and routines), willteach writing the records of measurement, processing and evaluation	-	•
or the moderations	practically extendible knowledge gained in lectures on physics.	511 01 100 atto. 7 tt ti 1	
02PRA2	Experimental Laboratory 2	KZ	6
	d especially for students who intend to study some of the physical specializations of FNSPE(branch Physical Engineering, Nuclear En	l .	
	ts interested in the otherspecializations. In Experimental laboratory students learn how to prepare for experiments (including work with the		
•	nt (acquire of different experimental procedures and routines), willteach writing the records of measurement, processing and evaluation		
	practically extendthe knowledge gained in lectures on physics.		
02SF	Subatomic Physics	Z,ZK	6
The goal of these	ectures is to present basic knowledge of particle physics. Students will become familiar with the structure of the matter, with elementa	ary interactions ar	nd with basic
laws of microcos	mos. Lectures will include basics of quantum mechanics and the theory of relativity needed for the description of elementary particles	behavior. Studer	nts will also
	become familiar with basic accelerating principles and with current particle physics experimental centers.		
02SF2	Subatomic Physics 2	Z,ZK	6
The aim of the co	urse is to teach students the basics of physics of atomic nucleus. Students will acquire knowledgeabout the basic properties of atomic	c nuclei and the w	ay they can
be measured. The	y will learn basic models, whichdescribe the structure of the atomic nucleus and nuclear reactions. Part of the lectures is also getting	familiar with thepl	hysics of the
	cosmic radiation and applications of nuclear physics.		,
02STR	Special Theory of Relativity	ZK	2
	Students extend their knowledge of classical, non-quantum mechanics of the special theory of relativity fundamentals.		
02TEF1	Theoretical Physics 1	Z,ZK	4
	troduction to analytical mechanics. The students acquire knowledge of the basic concepts of the Lagrange and Hamiltonian formalism	as well as diferent	t approaches
to description of o	dynamics (Newton's, Lagrange, Hamilton and Hamilton-Jacobi equations). The efficiency of these methods is illustrated on elementar		
		-	- 1
problem, the moti	on of a system of constrained mass points, and of a rigid body. Advanced parts of the course cover differential and integral principles	-	- 1
-	the first part of the course of classical theoretical physics (02TEF1, 02TEF2).	of mechanics. The	e subject is
02TEF2	the first part of the course of classical theoretical physics (02TEF1, 02TEF2). Theoretical Physics 2	of mechanics. The	e subject is
02TEF2 Tensors and trar	the first part of the course of classical theoretical physics (02TEF1, 02TEF2). Theoretical Physics 2 In a continuum. The special theory of relativity: relativistic mechanics and continuum. The special theory of relativity: relativistic mechanics and continuum.	of mechanics. Th	e subject is 4 eory in the
02TEF2 Tensors and trar	the first part of the course of classical theoretical physics (02TEF1, 02TEF2). Theoretical Physics 2 Instrumentations in physics. Mechanics of point mass, rigid body and continuum. The special theory of relativity: relativistic mechanics and me. Classical electrodynamics: Maxwell's equations in the Minkowski space-time, electromagnetic waves in dielectric media, electron	of mechanics. Th	e subject is 4 eory in the
02TEF2 Tensors and trar Minkowski space-ti	the first part of the course of classical theoretical physics (02TEF1, 02TEF2). Theoretical Physics 2 Instrumentations in physics. Mechanics of point mass, rigid body and continuum. The special theory of relativity: relativistic mechanics and me. Classical electrodynamics: Maxwell's equations in the Minkowski space-time, electromagnetic waves in dielectric media, electromagnetic machanics.	of mechanics. Th	e subject is 4 eory in the in the dipole
02TEF2 Tensors and trar Minkowski space-ti	the first part of the course of classical theoretical physics (02TEF1, 02TEF2). Theoretical Physics 2 Instrumetions in physics. Mechanics of point mass, rigid body and continuum. The special theory of relativity: relativistic mechanics and me. Classical electrodynamics: Maxwell's equations in the Minkowski space-time, electromagnetic waves in dielectric media, electromagnetion. Heat and Molecular Physics	Z,ZK d classical field the nagnetic radiation	e subject is 4 eory in the in the dipole
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02TEF2 Tensors and trar Minkowski space-ti 02TER Thermal expansion entropy; non-chem	the first part of the course of classical theoretical physics (02TEF1, 02TEF2). Theoretical Physics 2 Instormations in physics. Mechanics of point mass, rigid body and continuum. The special theory of relativity: relativistic mechanics and me. Classical electrodynamics: Maxwell's equations in the Minkowski space-time, electromagnetic waves in dielectric media, electromagnetic materials, approximation. Heat and Molecular Physics In of materials, heat transfer; stationary and non-stationary heat conduction, heat transfer and penetration; 1st and 2nd thermodynamical systems: dielectric and magnetic materials; Maxwell relations and thermodynamic potentials; kinetic theory: Maxwell's velocity dist	Z,ZK d classical field the nagnetic radiation Z,ZK c principle, ideal a tribution,equipartit	e subject is 4 eory in the in the dipole 4 and real gas, tion theorem.
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02ZM1			
	Foundations of Physical Measurements 1	ZK	2
	gned for students of physical specializations (Experimental particle physics, Physical engineering, Nuclear engineering), however, it can		-
other branches. I	ne goal of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired data basic habits of work in a physics lab.	on a PC. Stude	nts learn the
02ZM2	Foundations of Physical Measurements 2	KZ	4
	gned for students of physical specializations (Experimental particle physics, Physical engineering, Nuclear engineering), however, it can		1
	ne goal of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired data		-
	basic habits of work in a physics lab.		
02ZSM	Introduction to the Standard Model	ZK	2
Particles, leptons,	nadrons, baryons, mesons, symmetry, symmetry group, quarks, gluons, partons, standard model of electroweak and strong interaction	s, quantum chro	omodynamics
0.4.4.4.0	(QCD), cross section, scattering cross section.	7	T 4
04AKS	English Conversation velop the student's communication skills acquired throughout their previous studies. It aims to improve all aspects of oral communicat	Z ion The student	1
	r various communication situations and will master their communication strategy. They will also practise their listening skills in order to		· ·
•	scussions. The student will be trained to express their ideas clearly and according to current English usage, and become a more conf		
04XAM1	English for Intermediate Students M1	Z	2
The course is design	ned for students who have successfully completed the full secondary school English language course at least at the A2 level of the Co	ommon Europea	ın Framework
	nguages (CEFR). It provides an introduction into English for Specific and Academic Purposes (ESP, EAP), i.e., into fundamentals of v	•	
professional oral a	nd written communication situations. Thus it covers topics related to the student's life and needs as well as topics of subtechnical inte	rest. Attention is	also paid to
0474140	extending the knowledge of grammar issues used in EAP.	7	
04XAM2 The AM2 course	English for Intermediate Students M2 expects the student to have completed the AM1 course. It develops their skills for work with subtechnical texts, focusing also more on	Z specific gramma	2
	expects the student to have completed the Aivi1 course, it develops their skills for work with subtecrinical texts, locusing also more on special of ESP and EAP (e.g., definition, existence and classification of phenomena, object descriptions). Part of the course is also guided to		
	revision is included.	J	,, g
04XAM3	English for Intermediate Students M3	Z	2
The course develop	s the skills that enable students to cope with features typical of professional style. Increasing attention is paid to developing subtechnica	l vocabulary and	l independen
-	professional texts. Great emphasis is placed on distinguishing different levels of formal and informal oral and written communication a		
equivalents. The co	urse also includes studying abstracts and rules for writing them as well as basic rules for preparing and giving a short presentation on	a chosen topic	related to the
0.43/4.8.471/	student's field.	71/	1 4
04XAMZK	English for Intermediate Students Examination and is the examination as given by the study plan. The examination covers the AM1, AM2, and AM3 courses and consists of two parts	ZK	4
	on this the examination as given by the study plan. The examination covers the AMT, AMZ, and AMS courses and consists of two parts on min). The student is expected to master the AM syllabus and demonstrate the ability to apply their knowledge gained in the three Ei	-	iii) aliu olai
04XAP1	English for Advanced Students P1	Z	2
	gned for students who have successfully completed the full secondary school English language course (at least the B1 level of the Co	_	1
of Reference for	Languages - CEFR). It provides an introduction into English for Specific and Academic Purposes (ESP, EAP), i.e., into the fundamenta	als of vocabulary	, functions,
-	e typical of professional oral and written communication situations (fundamentals of terms in mathematics and physics, definitions, gra	-	-
covers professiona	oral and written communication on topics related to the undergraduate's life and needs. It develops skills for free professional writing (wri	ting a CV, letter	of application
04XAP2	polite request). If necessary, revision of selected grammar topics is included. English for Advanced Students P2	Z	2
-	based on AP1, thus extending the student's skills for working with subtechnical texts, and even with professional texts of chosen bran		. –
	s it concentrates on chosen grammar topics, but mainly intends to develop understanding of syntactic structures and typical rhetorical	01100 01 00101100.	
	d, if possible, a case study). Increasing emphasis is placed on the undergraduate's independent work with and reading of linguistically	functions (e.g.,	various types
The course extend	a, in possible, a sace study). Increasing emphasis to placed on the analogicadate of independent work with and reading of imgulation,		
The course exteria	s the student's subtechnical vocabulary, and includes fundamental notions of chosen branches of science. It is focused on formal writing	/ more demandi	ng materials.
	the student's subtechnical vocabulary, and includes fundamental notions of chosen branches of science. It is focused on formal writing paragraph structure, linking, cohesion and coherence in texts.	more demanding including the	ng materials. sentence and
04XAP3	s the student's subtechnical vocabulary, and includes fundamental notions of chosen branches of science. It is focused on formal writing paragraph structure, linking, cohesion and coherence in texts. English for Advanced Students P3	more demanding including the	ng materials. sentence and
04XAP3 The AP3 course is	s the student's subtechnical vocabulary, and includes fundamental notions of chosen branches of science. It is focused on formal writing paragraph structure, linking, cohesion and coherence in texts. English for Advanced Students P3 passed on AP2 and expects the student to work without any guidance with authentic professional materials and to interpret the text. It incomes	more demanding including the Z	ng materials. sentence and 2 al and writter
04XAP3 The AP3 course is communication sk	s the student's subtechnical vocabulary, and includes fundamental notions of chosen branches of science. It is focused on formal writing paragraph structure, linking, cohesion and coherence in texts. English for Advanced Students P3 passed on AP2 and expects the student to work without any guidance with authentic professional materials and to interpret the text. It includes and functions (e.g., expressing an opinion, agreement, and objections; taking part in discussion, note-taking; summarizing, writing	more demanding including the Z ludes training or an abstract) and	ng materials. sentence and 2 al and writter d, if possible,
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04XAP3 The AP3 course is communication sk also preparing a	s the student's subtechnical vocabulary, and includes fundamental notions of chosen branches of science. It is focused on formal writing paragraph structure, linking, cohesion and coherence in texts. English for Advanced Students P3 passed on AP2 and expects the student to work without any guidance with authentic professional materials and to interpret the text. It includes 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 languary communication.	r more demanding including the Z ludes training or an abstract) and age both in oral	ng materials. sentence and 2 all and writter d, if possible, and written
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04XCESP3	Czech for Foreigners - Advanced 3	Z	2
The course develop	ps the student's knowledge from CESP2. It includes working with authentic specialist materials, their interpretation and presentation, a	and, finally, present	tation of the
	student's project. Writing skills necessary for professional communication are trained.		
04XCESPZK	Czech for Foreign Students - Advanced Examination	ZK	4
	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 an	d can only
	be taken after successful completion of the 3 courses. Detailed information is to be obtained from the teacher.		
04XCESZ1	Czech for Foreigners - Beginners 1	Z	2
	gned for students on the English programme. Students will become acquainted with the main characteristics of Czech (phonetic and g		
	anguage and speaking skills. The course focuses on pronounciation exercises, simple social phrases, and oral and written communic		-
	uations. The course covers roughly lessons 1-5 in "Chcete mluvit" esky" by H. Remediosová and E. echová. At the end of the course,		
	A1 (CEFR) approximately.		
04XCESZ2	Czech for Foreigners - Beginners 2	Z	2
	communication competences acquired in CESZ1 are further developed. Students extend their knowledge of Czech declension and co	njugation system a	and practise
	f frequent topics. The course covers roughly lessons 6-10 in "Chcete mluvit esky" by H. Remediosová and E. echová. At the end of		
	have reached A2 (CEFR) approximately.		
04XCESZ3	Czech for Foreigners - Beginners 3	Z	2
	er develops the language and communication competences acquired in the XCESZ1 and XCESZ2 courses. The teaching focuses on	ا عن ouilding up basic	ocabulary,
	tion, deepening grammar, including grammar practice, and introducing Czech culture. Students are asked to produce simple texts and		·=
	ney also practise understanding texts in terms of main ideas or looking for specific details in texts. The course covers roughly lessons		
04XCESZZK	Czech for Foreigners – Beginners - Examination	ZK	4
	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.	52 5 2.,2,5 554.55	o a.i.a oa.i
04XFM1	French for Intermediate Students M1	Z	2
	ate FM The objective of this three-semester course is to improve and further develop communication in the French language in both v		
	promunicate in social interaction and in academic, scientific and professional environment. They will be able to use the language to tra		
	solve problems. FM1 The course builds on and further develops linguistic competence acquired at secondary school. It revises, syste	•	
	vious study. The following topics are covered: University studies in our country and in France, writing of transactional letters, CV, persor		0 0
	French culture and geography, Paris. Topics of specialization: mathematics, physics. Reading technical and popular science texts, wo		
04XFM2	French for Intermediate Students M2	7	2
-	on FM1. Linguistic structures and competence acquired in previous study are systemized and expanded. Reading popular science text	- 1	_
	nguage (passives, nominalization, word formation). Topics: physics, power engineering, environment, Internet, success of French science	= -	
and coloninio lai	scientists, artists and architects. Description of an object, device, shapes, dimensions, material.		,,
04XFM3	French for Intermediate Students M3	Z	2
	sed on improvement and further development of linguistic competence acquired during the follow-up courses. Syntactic structures (sub		
	res, compound tenses). Text summaryStudents prepare a written paper which will be delivered in form of an oral presentation in-class		
	iture specialisation or to their interest and generally covers a technical /applied science topic. It is not a translation but a creative work		
	e's own knowledge/experienceLonger monologues on topics /situations set for the examination are prepared. Text structure, cohesi	· ·	non artiolog
04XFMZK	French for Intermediate Students Examination	ZK	4
-	e examination as given by the study programme. The whole French programme is ended with an examination covering the contents of	1	=
THE COMMENT IS THE	consists of a written and oral part and is organized according to Examination Instructions, a document available on the well		armiation
04XFP1	French for Advanced Students P1	 Z	2
	reflict for Advanced Students 1.1 reseThe objective of this three-semester course is to improve and further develop communication in the French language in both writte	_	
	nicate in social interaction and in academic, scientific and work environment. They will be able to use the language to transmit general		
	FP1 The course builds on and further develops linguistic competence acquired at secondary school. Difficult grammar topics are repeated in the course builds on and further develops linguistic competence acquired at secondary school. Difficult grammar topics are repeated in the course builds on and further develops linguistic competence acquired at secondary school. Difficult grammar topics are repeated in the course builds on an acquired at the course builds on a course build on the course build on the course build of the course build on the course		
-	parfait, pronouns. The following specific topics are covered: University studies in our country and in France, writing of transactional le		-
	an advert, environmental issues, success of French science and technology, chosen topics from French regional culture, Paris. Topics of		
,	internet, physics, chemistry. Reading of technical and popular science texts, further work with these texts and interpretation	-	
04XFP2	French for Advanced Students P2	Z	2
	contents, the course further develops language skills. Focus is put on reading popular science texts and on oral communication on gi	ı	
	technical and scientific communication are stressed (passive voice, nominalization, word formation).		
04XFP3	French for Advanded Students P3	Z	2
	sed on systemization and improvement of acquired linguistic competence, skills and knowledge, and their use for communication in enc	l.	
	of shorter texts (both from and into the language). Writing of a paper and making oral presentation in-class. The paper generally covers	_	-
	topic. It is a creative work compiled from 3 French sources. Preparation of several set topics for oral examination.		
04XFPZK	French for Advanced Students Examination	ZK	4
	n program is ended with an examination covering the contents of FP1-FP3. The examination consists of a written and/or an oral part a		
	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	ı	
_	les French for specific / technical communication and reading of popular science and scientific texts. FZ1 The objective is to be able to		
	using the knowledge of 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		•
	directions, simple instructions and questions. Special attention is paid to pronunciation. Spelling is explained in connection with pronu		_
		iciation and gramm	
()4XF/7		Z	
04XFZ2 The course is linking	French for Beginners Z2	Z	2
The course is linki		Z textbook: Pravda -	2 Pravdová :
The course is linking French for Begin	French for Beginners Z2 ng up with FZ1. Elementary linguistic knowledge and communication skills are expanded. The scope is given by lessons 8 - 13 of the	Z textbook: Pravda - nt - disagreement,	2 Pravdová : apology,
The course is linking French for Begin	French for Beginners Z2 Ing up with FZ1. Elementary linguistic knowledge and communication skills are expanded. The scope is given by lessons 8 - 13 of the standard topics and skills are filled in from the textbook Espaces I, lesson 1 - 5 (introductions, invitation, welcoming, agreement	Z textbook: Pravda - nt - disagreement,	2 Pravdová : apology,
The course is linking French for Beging thanking, travelling	French for Beginners Z2 Ing up with FZ1. Elementary linguistic knowledge and communication skills are expanded. The scope is given by lessons 8 - 13 of the state of the state of the state of the scope is given by lessons 8 - 13 of the state of the sta	Z textbook: Pravda - nt - disagreement,	2 Pravdová : apology,
The course is linking French for Beging thanking, travelling 04XFZ3	French for Beginners Z2 Ing up with FZ1. Elementary linguistic knowledge and communication skills are expanded. The scope is given by lessons 8 - 13 of the others. Additional topics and skills are filled in from the textbook Espaces I, lesson 1 - 5 (introductions, invitation, welcoming, agreeme, map of France, food, expression of will, wish, order, prohibition, pleasure). Correct pronunciation is practiced. Stress on oral communication is practiced.	Z textbook: Pravda - nt - disagreement, cation. Specific topi	2 Pravdová : apology, cs covered:
The course is linking. French for Begir thanking, travelling 04XFZ3 The course builts	French for Beginners Z2 Ing up with FZ1. Elementary linguistic knowledge and communication skills are expanded. The scope is given by lessons 8 - 13 of the state of the scope is given by lessons 8 - 13 of the state of the scope is given by lessons 8 - 13 of the state of the scope is given by lessons 8 - 13 of the state of the scope is given by lessons 8 - 13 of the state of the scope is given by lessons 8 - 13 of the state of the scope is given by lessons 8 - 13 of the state of the scope is given by lessons 8 - 13 of the state of the scope is given by lessons 8 - 13 of the state of the scope is given by lessons 8 - 13 of the state of the scope is given by lessons 8 - 13 of the state of the scope is given by lessons 8 - 13 of the scope is given by lessons 1 - 15 of the scope is given by lessons	Z textbook: Pravda - nt - disagreement, cation. Specific topi	2 Pravdová : apology, cs covered: 2 Beginners.
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04XFZ4			
	French for Beginners Z4	Z	2
	s up on FZ3. Basic linguistic knowledge and skills are further developed. Oral communication and reading skills are practiced. The con he textbook French for Beginners, and is expanded with topics and functions from other materials. Reading is developed from the lecture		
	The course covers generals and specific topics: health- illness, sport, free time, environment, study, travelling in France, Paris, shopping		-
	country and in France, how to write CV, application, topics in mathematics, reading physics - mechanics, informatics, interne	•	,
04XFZ5	French for Beginners Z5	Z	2
=	red in FZ4 are further developed, as well as technical language. Students prepare a paper on a chosen popular science topic. They pre	=	
•	is covered by lessons 24 - 26 of the textbook: Pravda-Pravdova, French for Beginners, and is complemented from other materials. Top		
notes, success	of French science and technology, information about France. Grammar is systemized and complemented with syntax (subordinate cla subjunctive clauses, gerund, passive.	uses, typicai cor	njunctions,
04XFZZK	French for Beginners Examination	ZK	3
	examination as given by the study plan. The course is terminated with an examination consisting of oral and written part. The examination		1
	Instruction for examination. Its content covers the levels FZ1 - FZ5.	•	
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 str		
	n processes (e.g. importance of verb prefixes). In the lexical part, it covers topics referring to higher education in both the Czech Reput sues together with all necessary expressions and phrases, expressions and phrases needed to chemists, mathematicians, physicists,		-
on vii on in on a rio	terminology. It develops communication on related topics and is aimed at correct pronunciation, grammatical correctness and underst		ornaio or rr
04XNM2	German for Intermediate Students M2	Z	2
The course introdu	ces other more complex grammatical structures and their application in communication based on technical texts, such as the relation be	ween technolog	y and society
	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 systematic phenomena important for professional discourse (participles, relative clauses).	ally revises othe	r grammatica
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	_	1
the world at the	beginning of the 21st century, linguistically more demanding texts on the environment, the language of mathematics, computers and c	ar technology et	c. Students
practise reading for	information and reading aloud, and appropriate language for various purposes in oral and written communication. The course systematic	ally revises othe	r grammatical
0.43/4.18.471/	phenomena important for professional discourse (participles, relative clauses).	714	1
04XNMZK	German for Intermediate Students Examination t is the examination as given by the study plan. The whole German for Intermediate Students Course is completed by an examination or	ZK	4
	over the courses NM1 - NM3. The oral part follows after passing the written part successfully and after obtaining the 04NM3 assessme		
and oral, milen of	is to be obtained from the teacher.	moro dotano	
04XNP1	German for Advanced Students P1	Z	2
This course requi	res good grammar knowledge, extended general vocabulary, and good communication skills acquired at secondary school to be levell	ed off at the bed	inning of the
		_	_
	se is then focused on working with technical and scientific texts and practising reading techniques (skimming, scanning, reading for de	tail). It revises a	nd develops
	mar structures necessary for understanding a subtechnical text (passive voice, participles, participle structures) and it also focuses on prac-	tail). It revises a	nd develops
more difficult gramr		tail). It revises a	nd develops mmunication,
more difficult grammore difficul	mar structures necessary for understanding a subtechnical text (passive voice, participles, participle structures) and it also focuses on practice., telephoning.	tail). It revises a tical everyday co	nd develops mmunication,
more difficult gramm 04XNP2 The course develop vocabulary range. I	mar structures necessary for understanding a subtechnical text (passive voice, participles, participle structures) and it also focuses on practice., telephoning. German for Advanced Students P2 so the students' skills in working with professional scientific texts (understanding, summarising, note-taking, interpreting) while extending trintroduces mathematical expressions and texts of nuclear power engineering. Increasing emphasis is placed on understanding and practice.	tail). It revises a tical everyday co Z their general and ctising formal co	nd develops mmunication, 2 I subtechnica
more difficult gramm 04XNP2 The course develor vocabulary range. I b	nar structures necessary for understanding a subtechnical text (passive voice, participles, participle structures) and it also focuses on practice, the students of the studen	tail). It revises a tical everyday co Z their general and ctising formal co	nd develops mmunication, 2 I subtechnical mmunication,
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04XNP2 The course develor vocabulary range. I b 04XNP3 The course consi.	mar structures necessary for understanding a subtechnical text (passive voice, participles, participle structures) and it also focuses on practice, telephoning. German for Advanced Students P2 Description of the students' skills in working with professional scientific texts (understanding, summarising, note-taking, interpreting) while extending to introduces mathematical expressions and texts of nuclear power engineering. Increasing emphasis is placed on understanding and practice of the written and oral (CV, letter of application, interview, scholarship), and more complex grammatical structures (i.e., subjunctive, indirection). German for Advanced Students P3 sts of 3 main parts (general communicative situations, grammar and technical topics). Students will develop their vocabulary in a varie	tail). It revises a tical everyday control of their general and cotising formal coect speech).	nd develops mmunication, 2 disubtechnical mmunication, 2 on situations
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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 paraphrasing		
	od previous knowledge of general language at secondary level (listening, reading, correct communication in everyday situations). The		
	er study is aimed at professional and technical skills (reading technical literature according to the students´ specialization, oral and wr echnical vocabulary and practice quick and correct communication in professional situations. They will be able to both speak write accu		
develop their subte	technical topics.	matery and with com	idence on
04XRPZK	Russian for Advanced Students Examination	ZK	4
	nt is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowled		- 1
	lents are eligible for the oral examination only after a prior pass in RP3 and a successful written examination. Students are given instru		
04XRZ1	Russian for Beginners Z1	7	2
	ents the first stage of the five-semester programme, its final aim being reading and understanding professional texts written in Russian.	Thus it begins with r	
•	bet (for both reading and writing skills) and fundamentals of grammar necessary for everyday communication (listening and speaking)	_	- 1
	a short text with marked stress, understand its contents and summarize it.		
04XRZ2	Russian for Beginners Z2	Z	2
The second semes	ster of the programme is designed to teach skills for basic communication in everyday situations and for reading easy and short subte	chnical texts. Studen	nts will be
able to communica	te using short sentences and appropriate structures, and read aloud with confidence a short text without marked stress. They will also	-	oulary and
	master further grammatical structures. They will have mastered with confidence the Russian alphabet and will be able to use it in		
04XRZ3	Russian for Beginners Z3	Z	2
	d on RZ2 and includes further everyday topics, develops understanding of short compact texts on new subtechnical topics (for training		
and listening) an	id introduces new grammar. Students will be trained to distinguish intonation patterns while listening to spoken language. They will be	able to respond so a	as to be
0.41/10.7.4	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
	id on RZ3. It improves and expands the knowledge of general language in all four skills (reading and understanding longer texts with a conunication in everyday situations, writing longer texts). Students are trained to use grammar structures effectively (e.g., irregular verbs		
	dality, imperatives, conditionals). They practice and develop communication skills for everyday situations (food, travelling, free time), a		.
	on more specific topics (environment, addictions, the green movement). They become acquainted with various geographical data (e.g.	•	
	forms, look up the information from the timetable, learn about Russian holidays and typical meals.	,,,	
04XRZ5	Russian for Beginners Z5	Z	2
	s the student to have completed RZ4. It concentrates predominantly on reading skills (working with professional texts, i.e. understandin	g, extracting and sun	
information from a	specialized text) and speaking, and to a certain extent, writing about the professional information obtained by reading the texts. Comm	nunication skills are t	trained on
everyday topics. S	Studying grammar is based on professional and technical texts and only includes items typically used in professional communication (verbal adjectives, pa	rticiples,
passi	ve voice). Students develop their technical and economic vocabulary, and are also trained in some professional skills (writing a CV, po	lite request, etc.)	
04XRZZK	Russian for Beginners Examination	ZK	3
	nt is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowled	-	
	lents are eligible for the oral examination only after a prior pass in RZ5 and a successful written examination. Students are given instru	uctions by the teache	
04XSM1	Spanish for Intermediate Students M1	Z	2
	signed for students whose competence is at level B1 of CEFR, i.e. those who studied Spanish in the secondary school. The 3-semest ays attention to further grammar topics (e.g., perífrasis verbales, futuro imperfecto, direct object and indirect object pronouns, negativ	•	
	ays attention to further grammar topics (e.g., permasis verbales, luturo impenecto, direct object and indirect object prohouris, negative), to written and oral communication on a given everyday or easy subtechnical topic, for which the students are trained by reading tex		
04XSM2	Spanish for Intermediate Students M3	Z	2
	ops the students' knowledge from the previous course (SM1). Students are gradually acquainted with fundamentals of Spanish for		I
	able to work with specialized texts on the Internet.		
04XSM3	Spanish for Intermediate Students M3	Z	2
The course books	are supplemented with additional subtechnical materials, so the students will be gradually acquainted with the peculiarities of academic	c style. They will be c	competent
enough to use the	Internet in Spanish and search for information of their specialization or field of interest. Students will use the information to write short	t articles and summa	aries. The
	final part of the programme, general Spanish course based on course books, covers presentations and, finally, a written and oral example of the programme, general Spanish course based on course books, covers presentations and, finally, a written and oral example of the programme, general Spanish course based on course books, covers presentations and, finally, a written and oral example of the programme, general Spanish course based on course books, covers presentations and, finally, a written and oral example of the programme, general Spanish course based on course books, covers presentations and, finally, a written and oral example of the programme, general Spanish course based on course books, covers presentations and, finally, a written and oral example of the programme of t		
04XSMZK	Spanish for Intermediate Students Examination	ZK	4
The course conten	t is the examination as given by the study plan. SMZK examination consists of two parts - written and oral; to be eligible for the written pa	art, students will have	e obtained
0.41/0.01	non-graded assessment for course SM3.Oral examination follows the written part.	-	
04XSP1	Spanish for Advanced Students P1	Z	2
Course concentrate	es on more difficult grammar topics, revision of vocabulary, basics of Spanish for specific purposes as well as written communication. of CEFR.	Course prerequisites	s. level b2
04XSP2	Spanish for Advanced Students P2	Z	2
	second part of the advanced Spanish course, extending Spanish for specific purposes topics. It comprises more grammar and syntax		
000100 01 2 10 1110	written communication.	t and recoded on ma	opondon
04XSP3	Spanish for Advanced Students P3	Z	2
	final part of the advanced Spanish course. It is based on texts chosen by the students according to their future specialization. It is focu	sed on written comm	
	based on what students will need in their career.		
04XSPZK	Spanish for Advanced Students Examination	ZK	4
The course conten	t is the examination as given by the study plan. Examination SPZK consists of two parts, namely oral and written. The prerequisite for a	dmission to oral part	t is having
	passed the written test. Examination content is based on syllabi of courses SP1, SP2, and SP3 or on an individual study plan of the	student.	
04XSZ1	Spanish for Beginners Z1	Z	2
	first stage of the five-semester programme of Spanish studies; during the first stage the students will master phonetics and fundament		
	communicate at an elementary level on topics of everyday life. They will acquire and extend fundamental vocabulary of general Spani	i	
04XSZ2	Spanish for Beginners Students Z2	Z	2
	ed on course SZ1, and expects students to develop and extend the knowledge and skills acquired so far. Grammar structures and lexis		
triem to understand	d short adapted written texts and speech. Attention is also paid to cultural differences between Spanish-speaking countries and others	such as the Czech	Republic.
04XSZ3	Realia of Spanish-speaking countries are also included. Spanish for Reginners 73	Z	2
	Spanish for Beginners Z3 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					
	ntion to further grammar topics (perífrasis 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 listenir	-	ubjunctive),			
04XSZ5	Spanish for Beginners Z5	Z	2			
The course books	are supplemented with additional subtechnical materials, so the students will be gradually acquainted with peculiarities of Spanish fo	r specific purposes	s. In its final			
	part, the general Spanish course based on the course book will end with presentations and, finally, a written and oral examina					
04XSZZK	Spanish for Beginners Examination	ZK	3			
The course conte	ent is the examination as given by the study plan. Examination consists of two parts - written and oral. Student can register for oral examination as given by the study plan. Examination consists of two parts - written and oral. Student can register for oral examination as given by the study plan.	amination only if h	e/she has			
	passed the written examination test.					
12NME1	Numerical Methods 1	Z,ZK	4			
•	d the basic principles of numerical mathematics important for numerical solving of problems important for physics and technology. Met		1			
important for physi	cists (ordinary differential equations, random numbers) are included in addition to the basic numerical methods. Integrated computati used as a principle programming language as a demonstration tool. The seminars are held in computer laboratory.	onal environment	IVIAI LAD IS			
12PYTH	Scientific Programming in Python	Z	2			
	rse is to learn the fundamentals of the modern Python programming language with a focus on scientific computing. Emphasis is place	_				
	burse is performed in an interactive form of practical exercises, whose topics can be tailored to the content of other subjects or studer					
· ·	ig research. In the introductory part of the course, students learn the basic features of Python?from basic types to object oriented or i					
•	e course focuses on specific features of Python for scientific programming. Presented are the main numerical libraries NumPy, SciPy					
	library. We show how to generate efficient code, how to combine Python with other languages, what tools are available.	·	•			
12UNXAP	Introduction to UNIX	Z	2			
Computer and o	perating systems. Personal computer, workstation and supercomputers. Processor, memory, bus, devices, hard disk, network interface	ce. Hardware and	software.			
Principles of operat	ing systems. Operating system UNIX. Basic principles, kernel, kernel services. Documentation. File system, file atributes, working wit	th files. Text editors	s: vi, emacs.			
Command interpre	eter (shell) bash and its programming (scripts). Controlling processes, process status, computer load a process priorities. Standard to	ools. Graphical use	r interface			
X-windows. Com	nputer networks. Local computer networks. Global computer networks. Addresses and protocols TCP/IP. Network configutation of a computer networks.	omputer. Network	services:			
	hardware sharing, mail, scp, etc. Network applications					
12VKT	Vacuum Technology	KZ	4			
_	basic concepts and relations; diffusion,flow of rarefied gases. Flow and current of gas, conductivity. Interaction of gas with solid surface	•				
• •	olid matter; evaporation, condensation; Vacuum generation: Pumping proces, Ultimative pressure, Pumping speedPumps and their pro	-				
	n, Sliding vane rotary, Diffusion, Molecular, Roots, Molecular and Turbomolecular pumps. Sorption pumps: Cryopumps, Cryo-Adsorp					
NEG pumps, ion g	etter pumpsVacuum measurements: vacuum gauges of total and partial pressure; pumping speed; gas flow, search for leaks. Mater and seals.Practical exercises.	iais and vacuum c	omponents			
12VTV	Scientific and Technical Computing	Z	2			
	familiar with methods of solving of computational problems in the scientific and technical practice, and with methods of their program					
· ·	mainly to programming in the Fortran language.	· ·				
15CH1	General Chemistry 1	Z	3			
	t concepts, quantities and units used in chemistry are introduced in the course General Chemistry I. Their significance and practical u	se are illustrated b	y examples			
	solved in exercises.					
15CH2	General Chemistry 2	Z,ZK	3			
	continuation of the course General chemistry I. The main attention is paid to general principles governing chemical processes. Using v					
the validity of these	$principles \ is \ not \ restricted \ only \ to \ chemical \ processes \ is \ documented. \ The \ significance \ and \ practical \ use \ of \ explained \ principles \ are$	illustrated by exam	ples solved			
	in exercises.					
17UING	Introduction to Engineering	KZ	3			
=	les introduction to engineering skills. Students should gain general engineering skills at basic level (e.g. material properties and beha		nufacturing			
	nd production, quality assurance, environmental impacts,). In addition, the introduction to scientific work and technical drawing will					
17ZEL	Basics of Electronics	KZ	3			
· · · · · · · · · · · · · · · · · · ·	asic information of electronics. In the beginning, lectures are devoted to passive components - resistors, capacitors, inductors and sol					
	s deal with semiconductor components (standard, Zener, capacitive, LED), bipolar, unipolar transistors and semiconductor componer res continue with general amplifiers and operational amplifiers. Finally, lectures deal with digital circuits, digital/analog and analog/dig		` '			
ana macsy. Lectu	completed with electronic laboratory exercises.	ital converters. Let	biaics are			
18PRC1	Programming in C++ 1	Z	4			
1011101	This course covers mainly the C programming language and non-object oriented features of the C++ language.	- 1	.			
18PRC2	Programming in C++ 2	KZ	4			
	ourse covers the object oriented programming and othesr advanced constructs in the C+;+ programming language and the Standard		.			
18ZALG	Basics of Algorithmization	Z,ZK	4			
	devoted to selected algorithms and methods for algorithm design. This course intruduces selected methods for the determination of					
18ZPRO	Basics of Programming	Z	4			
· ·	ntended mainly for students with little or no experience in programming. It familiarizes the students with the basic concepts in program					
programming language.						
TV-1	Physical Education	Z	1			
TV-2	Physical Education	Z	1			
TV-3	Physical education	Z	1			

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TV-4

Physical education