Study plan

Name of study plan: Jaderné inženýrství - Jaderné reaktory

Faculty/Institute/Others:

Department:

Branch of study guaranteed by the department: Welcome page

Garantor of the study branch:

Program of study: Nuclear Engineering

Type of study: Bachelor full-time

Required credits: 0

Elective courses credits: 180 Sum of credits in the plan: 180

Note on the plan:

Name of the block: Compulsory courses in the specialization

Minimal number of credits of the block: 0

The role of the block: PS

Code of the group: BSPJIJR1

Name of the group: BS P_JIB JR 1st year

Requirement credits in the group:

Requirement courses in the group: In this group you have to complete at least 14 courses

Credits in the group: 0

Note on the group: Podmínkou skládání zkoušky 01MANZ je získání zápočtu z 01MAN.Podmínkou skládání

	zkoušky 01LALZ je získání zápočtu z 01	ĻAL.				
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
02ELMA	Electricity and Magnetism Iskender Yalcınkaya, Josef Schmidt, Ji í Hrivnák, Goce Chadzitaskos, Jan Vysoký Jan Vysoký Josef Schmidt (Gar.)	Z,ZK	6	4+2	L	PS
01LAL	Linear Algebra 1 Petr Ambrož, Lubomíra Dvo áková Lubomíra Dvo áková (Gar.) Dvo áková (Gar.)	Z	2	2P+2C		PS
01LALZ	Linear Algebra 1, exam Petr Ambrož, Lubomíra Dvo áková Lubomíra Dvo áková (Gar.)	ZK	2	0P+0C		PS
01LAL2	Linear Algebra 2 Petr Ambrož, Lubomíra Dvo áková Lubomíra Dvo áková (Gar.)	Z,ZK	4	2P+2C		PS
01MAN	Calculus 1 Pavel Strachota Pavel Strachota (Gar.)	Z	4	4+4		PS
01MANZ	Calculus 1, exam Pavel Strachota, Miroslav Kolá, Edita Pelantová Pavel Strachota Pavel Strachota (Gar.)	ZK	4	0P+0C		PS
01MAN2	Calculus 2 Maksym Dreval, Miroslav Kolá, Edita Pelantová Edita Pelantová Maksym Dreval (Gar.)	Z,ZK	8	4P+4C		PS
02MECH	Mechanics David Be Antonín Hoskovec David Be (Gar.)	Z	4	4+2	Z	PS
02MECHZ	Mechanics - Examination Iskender Yalcinkaya, Goce Chadzitaskos, Stanislav Skoupý, Petr Novotný, David Be, Filip Petrásek, Antonín Hoskovec Antonín Hoskovec David Be (Gar.)	ZK	2	-	Z	PS
00PT	Preparatory Week Petr Ambrož, Milan Krbálek Petr Ambrož Petr Ambrož (Gar.)	Z	2	týden	Z	PS
02TER	Heat and Molecular Physics Filip Petrásek Petr Novotný Petr Jizba (Gar.)	Z,ZK	4	2+2	L	PS
17UING	Introduction to Engineering Jan Frýbort, Petr Haušild, Radek Mušálek Jan Frýbort Jan Frýbort (Gar.)	KZ	3	2P+1C	Z	PS
16UJRF1	Introductory Nuclear and Radiation Physics 1	Z,ZK	4	2P+2C	L	PS
18ZPRO	Basics of Programming Jan Vondruška, Vladimír Jarý, Miroslav Virius, Jakub Klinkovský, Petr Pauš, Jan Tomsa, Zuzana Pet í ková Miroslav Virius Miroslav Virius (Gar.)	Z	4	4C	Z	PS

	Electricity and Magnetism	Z,ZK	6
Electric charge, Coulor	b's law, electrostatic field, Gauss' law. Electric dipole, polarization. Conductors and dielectrics. Electric current and circuits, cc		of the relativity
theory. Electrodynamic	forces, magnetic field. Magnetic dipole, magnetics. Electromagnetic induction, RLC circuits. Electromagnetic waves, Maxwell	equations.	
01LAL	Linear Algebra 1	Z	2
1. Vector space. 2. Line	ar dependence and independence. 3. Basis and dimension. 4. Subspaces of vector spaces. 5. Linear mappings. 6. Matrices of	linear mappings.	7. Frobenius
theorem.			
01LALZ	Linear Algebra 1, exam	ZK	2
01LAL2	Linear Algebra 2	Z,ZK	4
Outline: 1. Inverse mate	x and operator. 2. Permutation and determinant. 3. Spectral theory (eigenvalue, eigenvector, diagonalization). 4. Hermitian an	d quadratic forms	. 5. Scalar
product and orthogona	ity. 6. Metric geometry. 7. Riesz theorem and adjoint operator. Outline of the exercises: 1. Methods for calculation of inverse m	atrices. 2. Method	s of calculatio
of determinants. 3. Cal	ulation of eigenvalues and eigenvectors. 4. Hermitian and quadratic forms. Canonical form. 5. Scalar product and orthogonalit	ty. Calculation of c	orthogonal
complements. 6. Geom	etry exercises and examples. 7. Adjoint operators.		
01MAN	Calculus 1	Z	4
Basic calculus (real an	lysis, functions of one real variable, differential calculus).	1	
01MANZ	Calculus 1, exam	ZK	4
01MAN2	Calculus 2	Z,ZK	8
-	ential calculus: Taylor´s Polynomials, Taylor´s formula 2. Infinite series: criteria of convergence, operations on series, absolute	, ,	-
	er series, the Cauchy-Hadamard theorem, expansion of function into power series, summation of infinite series. 4. Theory of int		•
	chniques of integration and application of integrals, Generalized Riemann integral	,	
02MECH	Mechanics	Z	4
-	physical quantities and units. Kinematics of a particle, basic types of motion and their superposition. Dynamics of a particle, s	_	•
	n, motion in a central force field, forces in non-inertial reference frames. Mechanics of a system of particles, two-body problem	• .	
of a rigid body, rotation	,	.,,	
02MECHZ	Mechanics - Examination	ZK	2
-	ect is the examination according to the plan of studies.		_
00PT	Preparatory Week	Z	2
02TER	Heat and Molecular Physics	Z,ZK	4
	Treat and Molecular Frysics		
Thermal expansion of i	vaterials, heat transfer; stationary and non-stationary heat conduction, heat transfer and penetration; 1st and 2nd thermodyna	mic principle ide:	•
•	naterials, heat transfer; stationary and non-stationary heat conduction, heat transfer and penetration; 1st and 2nd thermodyna systems; dielectric and magnetic materials; Maxwell relations and thermodynamic potentials; kinetic theory; Maxwell's velocity (al and real ga
entropy; non-chemical	ystems: dielectric and magnetic materials; Maxwell relations and thermodynamic potentials; kinetic theory: Maxwell's velocity	distribution,equipa	al and real ga artition theore
entropy; non-chemical s	ystems: dielectric and magnetic materials; Maxwell relations and thermodynamic potentials; kinetic theory: Maxwell's velocity of Introduction to Engineering	distribution, equipa	al and real gas artition theorer
entropy; non-chemical : 17UING This course provides in	ystems: dielectric and magnetic materials; Maxwell relations and thermodynamic potentials; kinetic theory: Maxwell's velocity of Introduction to Engineering roduction to engineering skills. Students should gain general engineering skills at basic level (e.g. material properties and bel	distribution, equipa	al and real ga artition theorer
entropy; non-chemical s 17UING This course provides in and production, quality	ystems: dielectric and magnetic materials; Maxwell relations and thermodynamic potentials; kinetic theory: Maxwell's velocity of Introduction to Engineering roduction to engineering skills. Students should gain general engineering skills at basic level (e.g. material properties and belassurance, environmental impacts,). In addition, the introduction to scientific work and technical drawing will be included.	KZ havior, basics of n	al and real ga artition theore 3 nanufacturing
entropy; non-chemical statements of the statement of the	ystems: dielectric and magnetic materials; Maxwell relations and thermodynamic potentials; kinetic theory: Maxwell's velocity of Introduction to Engineering roduction to engineering skills. Students should gain general engineering skills at basic level (e.g. material properties and beliassurance, environmental impacts,). In addition, the introduction to scientific work and technical drawing will be included. Introductory Nuclear and Radiation Physics 1	distribution,equipa KZ havior, basics of n	al and real ga artition theore 3 nanufacturing
entropy; non-chemical s 17UING This course provides in and production, quality 16UJRF1 The aim of the course i	Introduction to Engineering skills. Students should gain general engineering skills at basic level (e.g. material properties and bel assurance, environmental impacts,). In addition, the introduction to scientific work and technical drawing will be included. Introductory Nuclear and Radiation Physics 1 to provide students with basic knowledge about atomic nucleus and radiation physics, which is followed by other specialized.	distribution,equipa KZ havior, basics of n Z,ZK lectures. The subj	al and real ga artition theore 3 nanufacturing 4 ect summariz
entropy; non-chemical statements of the course provides in and production, quality 16UJRF1 The aim of the course in the matic areas: develop	Introduction to Engineering conduction to engineering skills. Students should gain general engineering skills at basic level (e.g. material properties and bel assurance, environmental impacts,). In addition, the introduction to scientific work and technical drawing will be included. Introductory Nuclear and Radiation Physics 1 to provide students with basic knowledge about atomic nucleus and radiation physics, which is followed by other specialized ment of opinions on micro-wave and radiation physics, basic characteristics of the atom and nucleus, binding energy, measurement of opinions on micro-wave and radiation physics, basic characteristics of the atom and nucleus, binding energy, measurement of opinions on micro-wave and radiation physics, basic characteristics of the atom and nucleus, binding energy, measurement of opinions on micro-wave and radiation physics, basic characteristics of the atom and nucleus, binding energy, measurement of opinions on micro-wave and radiation physics, basic characteristics of the atom and nucleus, binding energy, measurement of opinions on micro-wave and radiation physics, basic characteristics of the atom and nucleus, binding energy, measurement of opinions on micro-wave and radiation physics, basic characteristics of the atom and nucleus, binding energy, measurement of the atom and nucleus and radiation physics.	distribution,equipa KZ havior, basics of n Z,ZK lectures. The subj	al and real ga artition theore 3 nanufacturing 4 ect summariz nd dimensions
entropy; non-chemical statements of the course provides in and production, quality 16UJRF1 The aim of the course in the matic areas: develop of the nuclei, the most in the course in the nuclei, the most in the course in the nuclei, the most in the course in the nuclei, the most in the nuclei, the most in the nuclei.	Introduction to Engineering irroduction to engineering skills. Students should gain general engineering skills at basic level (e.g. material properties and bel assurance, environmental impacts,). In addition, the introduction to scientific work and technical drawing will be included. Introductory Nuclear and Radiation Physics 1 to provide students with basic knowledge about atomic nucleus and radiation physics, which is followed by other specialized ment of opinions on micro-wave and radiation physics, basic characteristics of the atom and nucleus, binding energy, measure apportant nuclear models. General characteristics of the interaction of ionizing radiation with the matter, interaction of alpha, be	distribution,equipa KZ havior, basics of n Z,ZK lectures. The subj	al and real ga artition theore 3 nanufacturing 4 ect summariz nd dimensions
entropy; non-chemical statements of the course provides in and production, quality 16UJRF1 The aim of the course in the the course in the course in the course in the nuclei, the most in the course in the cour	Introduction to Engineering conduction to engineering skills. Students should gain general engineering skills at basic level (e.g. material properties and bel assurance, environmental impacts,). In addition, the introduction to scientific work and technical drawing will be included. Introductory Nuclear and Radiation Physics 1 to provide students with basic knowledge about atomic nucleus and radiation physics, which is followed by other specialized ment of opinions on micro-wave and radiation physics, basic characteristics of the atom and nucleus, binding energy, measurement of opinions on micro-wave and radiation physics, basic characteristics of the atom and nucleus, binding energy, measurement of opinions on micro-wave and radiation physics, basic characteristics of the atom and nucleus, binding energy, measurement of opinions on micro-wave and radiation physics, basic characteristics of the atom and nucleus, binding energy, measurement of opinions on micro-wave and radiation physics, basic characteristics of the atom and nucleus, binding energy, measurement of opinions on micro-wave and radiation physics, basic characteristics of the atom and nucleus, binding energy, measurement of opinions on micro-wave and radiation physics, basic characteristics of the atom and nucleus, binding energy, measurement of the atom and nucleus and radiation physics.	distribution,equipa KZ havior, basics of n Z,ZK lectures. The subj	al and real ga artition theorer 3 nanufacturing 4 ect summarize nd dimensions

Code of the group: BSPJIJR2

Name of the group: BS P_JIB JR 2nd year

Requirement credits in the group:

Requirement courses in the group: In this group you have to complete at least 11 courses

Credits in the group: 0

Note on the group	errori en Předmět 02TEF1 lze absolvova	t až po abso	lvování p	předměti	u 02MECF	IZ
Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members)	Completion	Credits	Scope	Semester	Role
	Tutors, authors and guarantors (gar.) Applied Numerical Methods					
12ANM	Pavel Váchal, Jan Pšikal, Alena Zavadilová Alena Zavadilová Jan Pšikal (Gar.)	KZ	4	2+2	L	PS
01ANB3	Calculus B 3 Milan Krbálek Milan Krbálek Milan Krbálek (Gar.)	Z,ZK	8	4P+4C		PS
01ANB4	Calculus B 4 Ji í Mikyška, Miroslav Kolá Ji í Mikyška Milan Krbálek (Gar.)	Z,ZK	6	2P+4C		PS
17NFYZ	Neutron physics Milan Štefánik Milan Štefánik Milan Štefánik (Gar.)	KZ	3	2P+1C		PS
15CH1	General Chemistry 1 Ond ej Holas, Petr Distler, Václav uba Petr Distler Petr Distler (Gar.)	Z	3	2+1	z	PS
17RFYZ	Reactor physics Jan Frýbort, Lenka Frýbortová Lenka Frýbortová Jan Frýbort (Gar.)	Z,ZK	4	2P+2C		PS
02TEF1	Theoretical Physics 1 Petr Novotný Michal Jex Igor Jex (Gar.)	Z,ZK	4	2+2	Z	PS
17TEMT	Thermodynamics and fluid mechanics of nuclear power plants Dušan Kobylka Dušan Kobylka Dušan Kobylka (Gar.)	Z,ZK	4	4P		PS

02TSFA	Thermodynamics and Statistical Physics	Z,ZK	4	2+2	L	PS
	Igor Jex, Jaroslav Novotný Antonín Hoskovec Igor Jex (Gar.) Waves, Optics and Atomic Physics		6	1	Z	
02VOAF	Josef Schmidt Jan Vysoký Ji í Tolar (Gar.)	Z,ZK	6	4+2		PS
16ZDOZ1	Fundamentals of Radiation Dosimetry 1 Tomáš Trojek Tomáš Trojek Tomáš Trojek (Gar.)	Z,ZK	4	2+2		PS
haracteristics of t	he courses of this group of Study Plan: Code=BSPJIJR2 Name	a-RSP IIR IR	2nd vos	r		
	Applied Numerical Methods	e=D0 1 _01D 010	Ziid yea		KZ	4
	ode 12YNME1. The basic principles of numerical mathematics important for the numeri	cal solution of physic	al and tech	1	1	-
•	I tasks, problems relevant to physicists are also included (e.g. solving ordinary differen			•	•	
	s numerical methods, their properties, and applications.					-, ··································
	Calculus B 3			7	,ZK	8
l l	and series - convergence range, criteria of uniform convergence, continuity, limit, diffe	rentiation and integra	ation of fund			_
-	rem. 2. Ordinary differential equations - equations of first order (method of integration f	_			-	
	ion) and equations of higher order (fundamental system, reduction of order, variation of					•
	uation). 3. Quadratic functions and quadrics. 4. Metric spaces - metric, norm, scalar prod	•			-	_
	pundary of set, completeness of space, Hilbert spaces. Orthogonal polynomials. Comp	_		-		-
•	y, partial and directional derivative, gradient, total derivatives and tangent plane. 6. Tay					
nalysis, Jacobi matrix.						
1ANB4	Calculus B 4			Z	Z,ZK	6
	ions. [2] Regular mapping, transformation of coordinates, non-cartesian coordinate sys	stems. [3] Local. con	strained. an			-
	Basics of the measure theory, and construction of the Lebesgue measure. [5] Integral			•		
	properties, theorem of Fubini, substitution theorem, theorems of Levi and Lebesgue.					
urface integrals. Integral	· ·	,		, ,	J	
	Neutron physics				KZ	3
1	sics" introduces students to the basics of neutron physics and its applications. The lectu	res start with the des	cription of th			vorld structu
•	protons and neutrons. After that a description of radioactivity and nuclear reactions foll					
ne matter. The probability	y of realization of particular nuclear reactions expressed by the effective cross-section	versus neutron ener	gy is descr	ibed. The iss	ues of refere	nce frames,
nechanisms of neutron in	nteractions, and issues of differential cross sections and neutron slowing down proces	s are discussed in d	etail. Fissio	n of heavy nu	ıclei is the ba	asis for the
peration of nuclear reac	tors. Students will get familiar with the conditions for realization of fission chain reaction	n. Finally, the most in	mportant ap	plications of	neutron phys	sics are
liscussed.						
15CH1	General Chemistry 1				Z	3
	epts, quantities and units used in chemistry are introduced in the course General Che	mistry I. Their signific	ance and p	ractical use a	are illustrated	d by exampl
olved in exercises.		, ,				, ,
7RFYZ	Reactor physics			7	Z,ZK	4
	sics helps Bachelors degree students to get acquainted with fundamentals of reactor p	hysics The students	will get bro		· .	-
	portant for nuclear reactors: fission products, yield of fission neutrons, energy release f	-	_	-		
	s of neutron balance in a nuclear reactor and definition of multiplication factor. The stu	,	0,			
=	n energy spectrum and group theory. Students will get knowledge of Ficks law and diffus		-	_		
	ing and non-multiplying media. The same theory is also utilized for large-scale calcula	=	-		-	
	compared to heterogeneous reactors. Lecture on fundamentals of nuclear rector kine					Ü
2TEF1	Theoretical Physics 1	•		7	Z,ZK	4
	tion to analytical mechanics. The students acquire knowledge of the basic concepts of t	he Lagrange and Har	niltonian for			
	s (Newtons, Lagrange, Hamilton and Hamilton-Jacobi equations). The efficiency of the	0 0				
	system of constrained mass points, and of a rigid body. Advanced parts of the course			-	-	-
	e of classical theoretical physics (02TEF1, 02TEF2).	co.or amoronial and	ograr pr		33.7411100. TTI	o oubjoot to
· · · · · · · · · · · · · · · · · · ·	Thermodynamics and fluid mechanics of nuclear power plants			7	Z,ZK	4
	, , ,	actors and nucles: =	ower plants			
-	ry of basic knowledge of the two theoretical fields which are important for the nuclear re	-	-	-	-	-
	chanics. Both fields are lectured with hand-on approach, so that students obtain eleme	emany view on issue,	uicy Will De	avie iu calc	uiaie DasiC d	ura sundinie

02VOAF Waves, Optics and Atomic Physics Z.ZK

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.

tasks and they will be able to study this issues in more details in next continuing special courses.

Thermodynamics and Statistical Physics

Z,ZK

Wave phenomena in mechanics and electromagnetism: modes, standing and travelling waves, wave packets indispersive media. Wave optics: polarization, interference, diffraction, coherence. Geometrical optics. Introduction to quantum 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.

16ZDOZ1 Fundamentals of Radiation Dosimetry 1 Z,ZK

History, development, and objectives of dosimetry. Quantities and units used for description of sources, fields, interactions of ionizing radiation, ionizations, energy transfer and absorption. Fundamentals of the effects of ionizing radiation.

Code of the group: BSPJIJR3

Name of the group: BS P_JIB JR 3rd year

Requirement credits in the group:

Requirement courses in the group: In this group you have to complete at least 14 courses

Credits in the group: 0

Note on the group:

02TSFA

Zkoušku z předmětu 01RMFB lze skládat až po složení všech zkoušek z Matematické analýzy a Lineární algebry. Předmět 17EXE si mohou zapsat pouze studenti oboru Jaderné inženýrství, specializace Jaderné reaktory.

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
17BPJI1	Bachelor Thesis 1 Dušan Kobylka, Tomáš Trojek, Jan Rataj Jan Rataj (Gar.)	Z	5	5ZP		PS
17BPJI2	Bachelor Thesis 2 Dušan Kobylka, Tomáš Trojek, Jan Rataj Jan Rataj (Gar.)	Z	10	10ZP		PS
17BPROV	Safe operation of nuclear facilities Lenka Frýbortová, ubomír Sklenka Lenka Frýbortová Lenka Frýbortová (Gar.)	KZ	2	2P		PS
17DEZA	Detection of Ionizing Radiation Martin Cesnek, Marcel Miglierini, Miloš Tichý Marcel Miglierini Marcel Miglierini (Gar.)	KZ	3	2P+1L	Z	PS
17EXE	Excursion Evžen Losa Evžen Losa (Gar.)	Z	2	1XT	Z	PS
17ENEF	Experimental Neutron Physics Jan Rataj, Jana Matoušková Jan Rataj Jan Rataj (Gar.)	KZ	3	1P+2L	L	PS
17IJR	Instrumentation of Nuclear Reactors Martin Kropík Martin Kropík Martin Kropík (Gar.)	Z	3	3P		PS
17JARE	Nuclear Reactors Tomáš Bílý Tomáš Bílý Tomáš Bílý (Gar.)	ZK	2	2	L	PS
17KOJE	Design and Equipment of Nuclear Power Plants Jan Rataj, Pavel Zácha Jan Rataj Jan Rataj (Gar.)	ZK	3	3P	L	PS
17PALC	Nuclear Fuel Cycle ubomír Sklenka, Evžen Losa, Radovan Starý ubomír Sklenka ubomír Sklenka (Gar.)	ZK	2	2P	L	PS
01PRST	Probability and Statistics Tomáš Hobza Tomáš Hobza (Gar.)	Z,ZK	4	3+1	Z	PS
01RMFB	Equations of Mathematical Physics B Václav Klika Václav Klika Václav Klika (Gar.)	Z,ZK	5	2P+2C		PS
17STJE	Heat Transfer in Nuclear Power Plants Dušan Kobylka, Martin Ševe ek, Sebastian Nývlt Martin Ševe ek Martin Ševe ek (Gar.)	Z,ZK	4	2P+2C		PS
01STME	Statistical Methods with Applications Tomáš Hobza Tomáš Hobza Tomáš Hobza (Gar.)	ZK	2	2P+0C		PS

Characteristics of the courses of this group of Study Plan: Code=BSPJIJR3 Name=BS P_JIB JR 3rd year

17BPJI1	Bachelor Thesis 1	Z	5
Student on the basis of	f theses assignment and under leading of a supervisor individually processes given topic during 2 semesters. The subject is ç	jiven by self-reliar	nt work on given
topic. The work is con-	inuously check by a supervisor.		
17BPJI2	Bachelor Thesis 2	Z	10
Student on the basis of	f theses assignment and under leading of a supervisor individually processes given topic during 2 semesters. The subject is ç	jiven by self-reliar	nt work on given
topic. The work is con-	inuously check by a supervisor.		
17BPROV	Safe operation of nuclear facilities	KZ	2
The aim of the subject	is to familiarize students with basic principles of nuclear safety.	'	•
17DEZA	Detection of Ionizing Radiation	KZ	3
The course provides b	asic information about sources and methods of detection of ionizing radiation and spectroscopy, with special emphasis on ne	utron detection ar	nd spectrometry.
The subject focuses of	n the physical principles of detection, but introduces detection technology to the extent appropriate. An important part is a labo	oratory practice, v	vhere students
individually solve seve	n tasks in groups of up to three students. It also includes writing a measurement report, which teaches to write scientific work		
17EXE	Excursion	Z	2
The goal of the subject	t is to familiarize students with institutions and industry connected with the nuclear energy production in the Czech Republic. I	he subject conte	nt is variable,
according to the possi	bilities of the participating companies, but it always covers basic fields: (i) research, development and engineering (e.g. ÚJV a	.s., CV ež s.r.o.,	ÚJF AV R,
ŠKODA JS a s) (ii) fu	el cycle (e.g. ILIP PRAHA a.s. SÚRAO F7 a.s.) (iji) electricity and heat production (F7 a.s.) (iv) radiation protection and	oversight (SLLIR	SÚRO) The

SKODA JS a.s.), (ii) fuel cycle (e.g. UJP PRAHA a.s., SÚRAO, EZ a.s.), (iii) electricity and heat production (EZ a.s.), (iv) radiation protection and oversight (SÚJB, SÚRO). The

subject requires 5 full days, which are uniformly spread among semester and examination period. 17FNFF **Experimental Neutron Physics**

The course is focused on experimental methods and experiments in the field of neutron physics, mainly using radionuclide neutron sources. The lectures are devoted to the theoretical bases necessary for preparation and realization of the laboratory exercises and to the methods of experimental data processing and evaluation. Specifically, the lectures provide detailed description of neutron properties and their utilization, the characteristics of neutron sources, properties of prompt and delayed neutrons, selected methods of neutron detection, neutron transport in substances, production, formation and modification of neutron fields and neutron beams. The lectures are complemented by the laboratory exercises in the field of neutron detection, measurement of delayed neutrons, study of neutron transport in various substances, experiments with various neutron sources (252Cf, AmBe, D-D neutron generator), preparation and detection of photo-neutron source, calibration of the radionuclide neutron source. The experiments are realized at the VR-1 training reactor and its laboratories.

Instrumentation of Nuclear Reactors

Lectures are concentrated on the instrumentation of nuclear reactors. The introduction is devoted to requirements on the safe operation of nuclear power plants and categorization of nuclear power plant systems with a respect to the nuclear safety according to IAEA, IEC and IEEE standards. Next, the attention is oriented to sensors of nuclear instrumentation netron detectors, their pulse, DC current and Campbell operation, thermocouples, thermoresistors, pressure and flow meters. Next part is directed to the incore and excore instrumentation of nuclear power plants Dukovany and Temelin, to the evaluation of their states and power measurement. Next are presented safety functions of nuclear power plants, their actication and systems that carries out safety actions. Attention is also given to the qualification of nuclear power plants systems. There are also presented examples of foreign nuclear power plants instrumentation. The conclusion of the lectures is oriented to requirements of research nuclear facilities instrumentation. The instrumentation of the VR-1 training reactor is presented in a detail, then instrumentations of LVR15, LR0, TRIGA Mark II and SUR100 reactors is also given.

17JARE Nuclear Reactors ZK

Introduction. World power issue. Previous evolution of power reactor. Nuclear fission reactors, fuel assemblies, active core, control systems, safety systems, containment. Classification of reactors into IV generations. Standard types of nuclear power reactors: concept, description, layout, previous evolution, world share, perspectives. Pressurized water reactors (PWR). Western-type PWR (Westinghouse, KWU, Framatom). VVER-type reactors, Temelín nuclear power plant. Boiling water reactors. Heavy water reactors, fast breeder reactors, high-temperature gas cooled reactors. Second nuclear era. reactors of generation III (EPR, AP-1000, VVER 1200, APR1000). Reactors of generation IV: Six selected concepts. Role of nuclear power in long-term outlook

17KOJE Design and Equipment of Nuclear Power Plants Main components of nuclear units. Basic designs of cooling circuits. Design of main parts of units with pressurized wa-ter reactors. Selected components of different nuclear power

plant units. Components of next technological systems ((accumulator tanks, boric acid systems, systems for coolant purification and coolant inventory control, hermetic space etc.). Requirements on electrical equipment and power output systems from nuclear power plant, examples of NPP wir-ing diagrams including electrical equipments parameters.

Nuclear Fuel Cycle The course deal with introduction to the nuclear fuel cycle of nuclear power plants, particularly PWR which are in operation in the Czech Republic or are under consideration for operation in future in the Czech Republic. The first part of the course is focused on front-end of the nuclear fuel cycle, the second part is focused on fuel utilisation in the reactor core and the third part of the course is focused on back-end of the nuclear fuel cycle.

01PRST Probability and Statistics

It is a basic course of probability theory and mathematical statistics. The probability theory is build gradually beginning with the classical definition and continuing till the Kolmogorov definition. The notions as random variable, distribution function of random variable and characteristics of random variable are treated and basic limit theorems are stated and proved. On the basis of this theory the basic methods of mathematical statistics such as estimation of distribution parameters and hypothesis testing are explained.

01RMFB Equations of Mathematical Physics B

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

17STJE Heat Transfer in Nuclear Power Plants

The course titled Heat Transfer in Nuclear Power Plants presents to the students the fundamental principles of heat transfer with a focus on nuclear power-related applications. Most of the terms and laws were introduced in the course 02TER which is a predecessor of this course. The course 17STJE elaborates the principles in details and extends the knowledge of students mainly in the areas related to the heat transfer in nuclear cores. An overview lecture of the basic principles will be given at the beginning of the course and all of the fundamental heat transfer mechanism will be discussed during the next weeks. It will start with conduction followed by convection and radiation at the end. The course focuses on the applications of thermokinetics related to nuclear reactors and equipment related to nuclear power plants and spent nuclear fuel. For that reason, conduction and convection are to be discussed into details. Convection is divided according the nature of the flow into laminar and turbulent. The concept of radiative heat transfer was theoretically introduced in previous courses and the applications and models used by industry will be presented here. The course includes also fundamentals of heat transfer with phase changes main emphasis is given to boiling. 01STME Statistical Methods with Applications

The course consists of selected methods of statistical data analysis such as: linear regression and correlation, analysis of variance, nonparametric methods, contingency tables, and their application. The aim is to illustrate the use of statistical procedures on examples. Solutions of concrete examples by use of statistical software are also included.

Name of the block: Compulsory elective courses

Minimal number of credits of the block: 0

The role of the block: PV

Code of the group: BSSPOLVEDY

Name of the group: BS - Social Sciences

Requirement credits in the group:

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

Credits in the group: 0

Note on the group:

Only one of these courses is obligatory.

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

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

00EKOT	Economy in Technology	Z	1
The course introduce	s the basics of micro- and macroeconomics.		
00ETV	Ethics of Science and Technology	Z	1
00RET	Rhetoric	Z	1
	d on the acquisition of speech and voice techniques and on the rules of correct pronounciation. The course is also devoted to t erbal aspects. Stylistics exercises, strategies for coping with stage-fright and a short excursion into the history of rhetoric are a	•	
00UPRA	Introduction to Law	Z	1
00UPSY	Introduction to Psychology	Z	1

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

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

Credits in the group: 0 Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
04XAMZK	English for Intermediate Students Examination Jana Ková ová, Slav na Brownová Jana Ková ová Jana Ková ová (Gar.)	ZK	4		Z	PV
04XAPZK	English for Advanced Students Examination Slav na Brownová, Darren Copeland Jana Ková ová Darren Copeland (Gar.)	ZK	4		Z	PV
04XCESZZK	Czech for Foreigners Beginners - Examination Slav na Brownová Jana Ková ová Jana Ková ová (Gar.)	ZK	4		Z	PV
04XCESMZK	Czech for Intermediate Students Examination Jana Ková ová Jana Ková ová Jana Ková ová (Gar.)	ZK	4		Z	PV
04XCESPZK	Czech for Foreign Students - Advanced Examination Jana Ková ová Jana Ková ová Jana Ková ová (Gar.)	ZK	4		Z	PV
04XFMZK	French for Intermediate Students Examination V ra Šlechtová V ra Šlechtová V ra Šlechtová (Gar.)	ZK	4		Z	PV
04XFPZK	French for Advanced Students Examination V ra Šlechtová V ra Šlechtová V ra Šlechtová (Gar.)	ZK	4		Z	PV
04XFZZK	French for Beginners Examination V ra Šlechtová V ra Šlechtová V ra Šlechtová (Gar.)	ZK	3		L	PV
04XNMZK	German for Intermediate Students Examination Miloslava echová Miloslava echová Miloslava echová (Gar.)	ZK	4		Z	PV
04XNPZK	German for Advanced Students Examination Miloslava echová Miloslava echová Miloslava echová (Gar.)	ZK	4		Z	PV
04XRMZK	Russian for Intermediate Students Examination Zhanna Isaeva Zhanna Isaeva Zhanna Isaeva (Gar.)	ZK	4		Z	PV
04XRPZK	Russian for Advanced Students Examination Zhanna Isaeva Zhanna Isaeva Zhanna Isaeva (Gar.)	ZK	4		Z	PV
04XRZZK	Russian for Beginners Examination Zhanna Isaeva Zhanna Isaeva Zhanna Isaeva (Gar.)	ZK	3		L	PV
04XSMZK	Spanish for Intermediate Students Examination Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)	ZK	4		Z	PV
04XSPZK	Spanish for Advanced Students Examination Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)	ZK	4		Z	PV
04XSZZK	Spanish for Beginners Examination Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.) Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo	ZK	3		L	PV

04XSZZK	Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)	ZK	3	L	PV
Characteristics	of the courses of this group of Study Plan: Code=BSPJAZYKYZK N	ame=BS P la	nguages		
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 AM	3 courses and co	nsists of two	parts - written (100	min) and oral
(20-30 min). The stu	dent is expected to master the AM syllabus and demonstrate the ability to apply their knowled	ge gained in the t	hree English	courses.	
04XAPZK	English for Advanced Students Examination			ZK	4
The course content i	is the examination as given by the study plan. The student is supposed to demonstrate master	ing the 04XAP3 s	yllabus and	the ability to apply th	eir knowledge
	e 04XAP courses. In addition to passing courses 04XAP1, 04XAP2, and 04XAP3, a prerequisite examination consists of 2 parts - written and oral.	te for taking the e	xam is a pres	sentation on a speci-	alized topic in the
04XCESZZK	Czech for Foreigners Beginners - Examination			ZK	4
The course content i	is the examination as given by the study plan. The examination consisting of a written and oral	part covers all th	e topics of th	ne 04XCESZ1,2,3 cc	urses and can
only be taken after s	successful completion of all three courses. Detailed information is to be obtained from the teach	ner.			
04XCESMZK	Czech for Intermediate Students Examination			ZK	4
The course content i	is the examination as given by the study plan. The examination consisting of a written and oral	part covers all th	e topics of th	ne CESM1,2,3 cours	es and can only
be taken after succe	essful completion of the 3 courses. Detailed information is to be obtained from the teacher.				
04XCESPZK	Czech for Foreign Students - Advanced Examination			ZK	4
The course content i	is the examination as given by the study plan. The examination consisting of a written and oral	part covers all th	e topics of th	ne CESP1,2,3 course	es and can only
be taken after succe	essful completion of the 3 courses. Detailed information is to be obtained from the teacher.				
04XFMZK	French for Intermediate Students Examination			ZK	4
The content is the ex	xamination as given by the study programme. The whole French programme is ended with an	examination cove	ring the cont	ents of FM1-FM3. The	ne examination
consists of a written	and oral part and is organized according to Examination Instructions, a document available or	the web.			
04XFPZK	French for Advanced Students Examination			ZK	4
The whole French pr	rogram is ended with an examination covering the contents of FP1-FP3. The examination cons	sists of a written a	nd/or an ora	l part and is organize	ed according to
Examination Instruct	tions, a document available on the web. Assessment of the presentation is included into the ex	amination grading	g .		
04XFZZK	French for Beginners Examination			ZK	3
The content is the ex	xamination as given by the study plan. The course is terminated with an examination consisting	g of oral and writt	en part. The	examination is ruled	by the document
Instruction for exami	ination. Its content covers the levels FZ1 - FZ5.				
04XNMZK	German for Intermediate Students Examination			ZK	4
The course content i	is the examination as given by the study plan. The whole German for Intermediate Students Co	urse is completed	by an exami	ination consisting of	two parts - written
and oral, which cove	er the courses NM1 - NM3. The oral part follows after passing the written part successfully and	after obtaining th	e 04NM3 as	sessment. More deta	ailed information
is to be obtained from	m the teacher.				

4XNPZK	German for Advanced Students Examination	ZK	4
he course content is	the examination as given by the study plan. The whole German for Advanced Students Course is completed by an examinat	ion consisting of tw	o parts - writter
nd oral, which cover	the courses NP1 - NP3. The oral part follows after passing the written part successfully and after obtaining the 04NP3 ungra	ded assessment. M	ore detailed
formation is to be ob	tained from the teacher.		
4XRMZK	Russian for Intermediate Students Examination	ZK	4
he course content is	the examination as given by the study plan. The course is completed by taking a written and oral examination testing the known	owledge and skills a	cquired in RM1
RM3. Students are e	ligible for the oral examination only after a prior pass in RM3 and a successful written examination. Students are given instru	ctions by the teach	er.
4XRPZK	Russian for Advanced Students Examination	ZK	4
he course content is	the examination as given by the study plan. The course is completed by taking a written and oral examination testing the known	owledge and skills a	cquired in RP1
RP3. Students are el	igible for the oral examination only after a prior pass in RP3 and a successful written examination. Students are given instruc	ctions by the teache	r.
4XRZZK	Russian for Beginners Examination	ZK	3
he course content is	the examination as given by the study plan. The course is completed by taking a written and oral examination testing the known	owledge and skills a	cquired in RZ1
RZ5. Students are el	igible for the oral examination only after a prior pass in RZ5 and a successful written examination. Students are given instruc	tions by the teache	r.
4XSMZK	Spanish for Intermediate Students Examination	ZK	4
he course content is	the examination as given by the study plan. XSMZK examination consists of two parts: written and oral; to be eligible for the	written part, studen	ts will have
otained non-graded	assessment for course XSM3. Oral examination follows the written part.		
4XSPZK	Spanish for Advanced Students Examination	ZK	4
he course content is	the examination as given by the study plan. Examination XSPZK consists of two parts, namely oral and written. The prerequ	isite for admission t	o oral part is
aving passed the wri	tten test. Examination content is based on syllabi of courses XSP1, XSP2, and XSP3 or on an individual study plan of the st	udent.	
aving passed the will			
4XSZZK	Spanish for Beginners Examination	ZK	3

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

The role of the block: V

Code of the group: BSPJIJRV

Name of the group: BS P_JIB JR Optional courses

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

Credits in the group: 0 Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
02DEF1	History of Physics 1 Igor Jex Igor Jex (Gar.)	Z	2	2+0	Z	V
02DEF2	History of Physics 2 Igor Jex Igor Jex (Gar.)	Z	2	2+0	L	V
17ENER	Energy Ond ej Novák, Miloš Tichý Miloš Tichý Miloš Tichý (Gar.)	ZK	2	2P	L	V
02EXF	Experimental Physics Jaroslav Adam, Barbara Antonina Trzeciak, Jaroslava Óbertová, Katarína K ížková Gajdošová Jaroslava Óbertová Katarína K ížková Gajdošová (Gar.)	ZK	2	2P+0C	Z	٧
02PRA1	Experimental Laboratory 1 Libor Škoda, Jaroslav Biel ík Jaroslav Biel ík (Gar.)	KZ	6	0+4	Z	V
02PRA2	Experimental Laboratory 2 Libor Škoda, Jaroslav Biel ík Jaroslav Biel ík (Gar.)	KZ	6	0+4	L	V
02FYS1	Physical Seminar 1 Jaroslav Adam Filip Petrásek (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 B e	Z	1	0+1		V
00MAM2	Essentials of High School Math Course 2 Lukáš Heriban Lukáš Heriban Lukáš Heriban (Gar.)	Z	1	0+1		V
17NRE	Experiment Design and Control Martin Kropík Martin Kropík Martin Kropík (Gar.)	Z,ZK	3	2+1	Z	V
15CH1	General Chemistry 1 Ond ej Holas, Petr Distler, Václav uba Petr Distler Petr Distler (Gar.)	Z	3	2+1	Z	V
15CH2	General Chemistry 2 Ond ej Holas, Petr Distler, Václav uba Petr Distler Petr Distler (Gar.)	Z,ZK	3	2+1	L	V
18PRC1	Programming in C++ 1 Vladimír Jarý, 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.)	KZ	4	2+2	L	V

18PMTL	Programming in MATLAB	KZ	4	4C		V
TOFWIL	Mat j Pokorný, Quang Van Tran, Jaromír Kukal Quang Van Tran Jaromír Kukal (Gar.)	I\Z	4	40		V
17TEXT	Writing and presenting academic text ubomír Sklenka ubomír Sklenka (Gar.)	KZ	2	1P+1C	Z	V
TV-1	Physical Education	Z	1		Z	V
TV-2	Physical Education	Z	1		L	V
TV-3	Physical education	Z	1	0+2	Z	V
TV-4	Physical education	Z	1	0+2	L	V
14TED	Creating Electronic Documents Aleś Materna, Ji i Martin ik Aleś Materna Aleš Materna (Gar.)	Z	2	26C		V
16ZIVB	Introduction to Ecology	KZ	2	2+0	Z	V
02UFEC	Introduction to Elementary Particle Physics Jaroslav Biel ík, Marek Matas Jaroslav Biel ík Jaroslav Biel ík (Gar.)	Z	2	2+0	Z	V
18ZALG	Basics of Algorithmization Vladimír Jarý, Miroslav Virius, Petr Pauš, Jan Tomsa, Zuzana Pet í ková, František Vold ich, František Gašpar Vladimír Jarý Miroslav Virius (Gar.)	Z,ZK	4	2+2	L	V
17ZEL	Basics of Electronics Martin Kropík Martin Kropík Martin Kropík (Gar.)	KZ	3	2+2	Z	V
02ZM1	Foundations of Physical Measurements 1 Solangel Rojas Torres, Petr Chaloupka Petr Chaloupka (Gar.)	ZK	2	2P+0C	Z	V
02ZM2	Foundations of Physical Measurements 2 Petr Chaloupka Petr Chaloupka (Gar.)	KZ	4	0P+4L	L	V
Characteristics of the	ne courses of this group of Study Plan: Code=BSPJIJRV Name=	BS P_JIB JR	Optiona	al courses		
15CH1 (General Chemistry 1				Z	3
The most important conce	epts, quantities and units used in chemistry are introduced in the course General Chemis	stry I. Their signific	ance and p	oractical use a	re illustrate	ed by example
solved in exercises.						
The state of the s	History of Physics 1			1	Z	2
•	e system of sciences. The relationship of man and nature. Natural sciences in ancient O					•
•	ed. Arabic science, European science in Middle Ages. Renaissance - da Vinci, Giordano	Bruno. Copernicus	s, Kepler, (Galileo, Huyge	ns. The bir	th of physics
as experimental science. I						
	History of Physics 2			1	Z	2
•	mechanics after Newton, Bernoulli's, Euler, Lagrange. Historical development of optics, c	•			•	
	electrodynamics and electromagnetism, Faraday and Maxwell. Thermodynamics and its					•
	anck and Einstein. Discovery of radioaktivity, structure of atom, atomic nucleus, Rutherfo	ord and Bohr. The	way to nuc	lear energy, E	lementary	particles,
	ept of Nature and Universe of today.					
	Energy				ZK	2
•	ents with basic information about energy industry as a branch of economy. It has five co-	•		_	-	
•	sport and consumption. Energy industry of the Czech Republic, including history with an	•				
•	s, a description of the main Czech energy industry components and the State Energy Sti	0,	•		•	
	including important processes, documents and legal instruments. Institutions of energy s	•	•			•
-	ically in the EU and the Czech Republic. Attention is also paid to energy modelling. Technic	-				
•	ic technical description of fossil, nuclear, water, wind and solar power plants, including a d ena such as greenhouse effect and climate change. Attention is also paid to energy netw		•		•	
- ·	rgy industry and student presentations on the chosen topic.	vorks. The conclus	sion or the	course is deve	ited to disc	ussing or the
				-	71/	
I	Experimental Physics	and and instrumen		1	ZK	2
-	to introduce the students the principles of physics measurements, their techniques, meth	nous and instrume	enis inai ar	e used for suc	n measure	ments, and t
analysis of measured data					(7	
	Experimental Laboratory 1				(Z	. 6
· ·	ially for students who intend to study some of the physical specializations of FNSPE(bra	, ,	•	ŭ	•	
	ested in the otherspecializations. In Experimental laboratory students learn how to prepare		-		-	-
, ,	uire of different experimental procedures and routines), willteach writing the records of m	easurement, proc	essing and	a evaluation of	results. At	tne same tin
· ·	vledge gained in lectures on physics.			-		
Lecture is intended espec	Experimental Laboratory 2				(Z	6
	experimental Laboratory 2 ially for students who intend to study some of the physical specializations of FNSPE(bra		-	uclear Engine	ering). But	it can be also
•	Experimental Laboratory 2 ially for students who intend to study some of the physical specializations of FNSPE(brainested in the otherspecializations. In Experimental laboratory students learn how to prepare	for experiments (in	ncluding wo	uclear Engine ork with theliter	ering). But ature), the	it can be also implementati
of the measurement (acqu	experimental Laboratory 2 ially for students who intend to study some of the physical specializations of FNSPE(bra	for experiments (in	ncluding wo	uclear Engine ork with theliter	ering). But ature), the	it can be also implementation

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The seminar is devoted to detailed study of interesting physical problems. It should help students to deeper understanding of fundamentals of physics presented in the course of

The course will develop the student's communication skills acquired throughout their previous studies. It aims to improve all aspects of oral communication. The student will develop their vocabulary for various communication situations and will master their communication strategy. They will also practise their listening skills in order to better follow and participate

The course introduces the fundamental areas of mathematics essential for university studies and practical applications. It covers sets, logic, proofs, functions, derivatives, integrals,

Mechanics. The problems are chosen, studied and presented by the students themselves, with the possibility to use PC and physical laboratory equipments.

in discussions. The student will be trained to express their ideas clearly and according to current English usage, and become a more confident speaker.

Ζ

Z

Z

2

1

02FYS1

04AKS

00MAM1

00MAM2

Physical Seminar 1

English Conversation

Essentials of High School Course 1

Students are introduced to mathematical concepts and methods used in the introductory physics course.

analytic geometry, combinatorics, and probability, with emphasis on understanding principles, rigor, and problem solving.

Essentials of High School Math Course 2

17NRE	Experiment Design and Control	Z,ZK	3
Lecture deals with design	gn and operation of systems for control of experiments, acquisition and evaluation of experimental data. It provides information	n about interfaces	of personal
computers for control of	experimental systems (COM, USB, Firewire, LAN, GPIB), further about measuring systems with VME, VXI and LXI interface	s, discuss their ad	vantages and
disadvantages. Next, le	ctures deal with programming of measuring systems - special dedicated software, problems of use of high programming lang	uages and especia	ally use of
graphical oriented devel	opment tools (Agilent VEE and LabView); data acquisition and evaluation. Finally, students prepare individual software project for	or data acquisition	and evaluation.
15CH2	General Chemistry 2	Z,ZK	3
The subject is the contin	uation of the course General chemistry I. The main attention is paid to general principles governing chemical processes. Usin	ng various exampl	es, the fact that
the validity of these prin	ciples is not restricted only to chemical processes is documented. The significance and practical use of explained principles a	are illustrated by ex	xamples solved
in exercises.			
18PRC1	Programming in C++ 1	Z	4
	nly the C programming language and non-object oriented features of the C++ language.		
18PRC2	Programming in C++ 2	KZ	4
	object oriented programming and othesr advanced constructs in the C+;+ programming language and the Standard Template		
18PMTL	Programming in MATLAB	KZ	4
	ronment as efficient tool for computation in complex arrays and symbolic variables, namely for linear algebra, mathematic ana		- 1
and geometric represer		llysis, statistics, al	goriumization
		1/7	
17TEXT	Writing and presenting academic text	KZ	.2
	examples development of soft skills how to write and present academic text. The first part of the course is dedicated to introdu	-	-
	al rules for writing an academic text, and creating an appropriate structure of the written text. Follows lectures related to basic		• .
•	n text; rules how to write and create tables, graphs, figures; differences between new text and plagiarism; and how to manage		
	ar engineering. In this part, students are familiarised with widely used software for the writing of the academic text. The first provided the control of th		
· -	kt, mainly to introduction to verbal and non-verbal aspects of presentation; to all stages of presentation building; and widely used	•	- 1
	w theoretical lectures give a chance to students to apply theory into practice with the primary aim to give the first experiences	to students before	e tney start
writing and presenting t			
TV-1	Physical Education	Z	1
TV-2	Physical Education	Z	1
TV-3	Physical education	Z	1
TV-4	Physical education	Z	1
14TED	Creating Electronic Documents	Z	2
Basic skills for creating	and presenting student theses. Individual exercises focus on creating and formatting texts, equations, charts, tables, presents	ations and entire d	ocuments in an
office suite.			
16ZIVB	Introduction to Ecology	KZ	2
	t basic of the ecologic principles, terms and ideas. It covers overview information regarding to particular components of the en	1	
indicators and sustainal			
02UFEC	Introduction to Elementary Particle Physics	Z	2
	easily accessible introduction to elementary particle physics. Development, methods, goals and perspectives of the subject a	1	-
18ZALG		Z,ZK	4
	Basics of Algorithmization	, ,	- 1
	to selected algorithms and methods for algorithm design. This course intruduces selected methods for the determination of the		
17ZEL	Basics of Electronics	KZ	3
•	information of electronics. In the beginning, lectures are devoted to passive components - resistors, capacitors, inductors and		I
	al with semiconductor components (standard, Zener, capacitive, LED), bipolar, unipolar transistors and semiconductor compo		, , ,
•	ntinue with general amplifiers and operational amplifiers. Finally, lectures deal with digital circuits, digital/analog and analog/di	gital converters. L	ectures are
completed with electron			
02ZM1	Foundations of Physical Measurements 1	ZK	2
-	for students of physical specializations (Experimental particle physics, Physical engineering, Nuclear engineering), however,		-
•	al of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired decreases and evaluation of acquired decreases.	ata on a PC. Stude	ents learn the
basic habits of work in a	· · ·		
02ZM2	Foundations of Physical Measurements 2	KZ	4
The course is designed	for students of physical specializations FNSPE (Nuclear and Particle Physics, Physical engineering, Nuclear engineering), ho	owever, it can be a	ttended by
students of other branch	ues. The goal of the course is to practically introduce students to the basics of physical measurements of the most important qua	ntities the method	s of processing

and evaluation of acquired data on a PC. Students learn the basic habits of work in a physics lab.

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

Credits in the group: 0 Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
04XAM1	English for Intermediate Students M1 Jana Ková ová Jana Ková ová (Gar.)	Z	2	0+2	Z	٧
04XAM2	English for Intermediate Students M2 Jana Ková ová Jana Ková ová (Gar.)	Z	2	0+2	L	V
04XAM3	English for Intermediate Students M3 Jana Ková ová Jana Ková ová (Gar.)	Z	2	0+2	Z	V

04XAP1	English for Advanced Students P1 Jana Ková ová Darren Copeland (Gar.)	Z	2	0+2	Z	V
04XAP2	English for Advanced Students P2 Jana Ková ová Darren Copeland (Gar.)	Z	2	0+2	L	V
04XAP3	English for Advanced Students P3 Jana Ková ová Darren Copeland (Gar.)	Z	2	0+2	Z	V
04XCESZ1	Czech for Foreigners - Beginners 1 Jana Ková ová Jana Ková ová (Gar.)	Z	2	0+2	Z	V
04XCESZ2	Czech for Foreigners - Beginners 2 Jana Ková ová Jana Ková ová (Gar.)	Z	2	0+2	L	V
04XCESZ3	Czech for Foreigners - Beginners 3 Jana Ková ová Jana Ková ová (Gar.)	Z	2	2S	Z	V
04XCESM1	Czech for Foreigners - Intermediate 1 Jana Ková ová Jana Ková ová (Gar.)	Z	2	0+2	Z	V
04XCESM2	Czech for Foreigners - Intermediate 2 Jana Ková ová Jana Ková ová (Gar.)	Z	2	0+2	L	V
04XCESM3	Czech for Foreigners - Intermediate 3 Jana Ková ová Jana Ková ová (Gar.)	Z	2	0+2	Z	V
04XCESP1	Czech for Foreign Students - Advanced 1 Jana Ková ová Jana Ková ová (Gar.)	Z	2	0+2	Z	V
04XCESP2	Czech for Foreigners - Advanced 2 Jana Ková ová Jana Ková ová (Gar.)	Z	2	0+2	L	V
04XCESP3	Czech for Foreigners - Advanced 3 Jana Ková ová Jana Ková ová (Gar.)	Z	2	0+2	Z	V
04XFM1	French for Intermediate Students M1 V ra Šlechtová V ra Šlechtová (Gar.)	Z	2	0+2	Z	V
04XFM2	French for Intermediate Students M2 V ra Šlechtová V ra Šlechtová (Gar.)	Z	2	0+2	L	V
04XFM3	French for Intermediate Students M3 V ra Šlechtová V ra Šlechtová (Gar.)	Z	2	0+2	Z	V
04XFP1	French for Advanced Students P1 V ra Šlechtová V ra Šlechtová (Gar.)	Z	2	0+2	Z	V
04XFP2	French for Advanced Students P2 V ra Šlechtová V ra Šlechtová (Gar.)	Z	2	0+2	L	V
04XFP3	French for Advanded Students P3 V ra Šlechtová V ra Šlechtová (Gar.)	Z	2	0+2	Z	V
04XFZ1	French for Beginners Z1 V ra Šlechtová V ra Šlechtová (Gar.)	Z	2	0+4	L	V
04XFZ2	French for Beginners Z2 V ra Šlechtová V ra Šlechtová (Gar.)	Z	2	0+4	Z	V
04XFZ3	French for Beginners Z3 V ra Šlechtová V ra Šlechtová (Gar.)	Z	2	0+4	L	V
04XFZ4	French for Beginners Z4 V ra Šlechtová V ra Šlechtová (Gar.)	Z	2	0+4	Z	V
04XFZ5	French for Beginners Z5 V ra Šlechtová V ra Šlechtová (Gar.)	Z	2	0+4	L	V
04XNM2	German for Intermediate Students M2 Miloslava echová Miloslava echová (Gar.)	Z	2	0+2	L	V
04XNM1	German for Intermediate Students M1 Miloslava echová Miloslava echová (Gar.)	Z	2	0+2	Z	V
04XNM3	German for Intermediate Students M3 Miloslava echová Miloslava echová (Gar.)	Z	2	0+2	Z	V
04XNP1	German for Advanced Students P1 Miloslava echová Miloslava echová (Gar.)	Z	2	0+2	Z	V
04XNP2	German for Advanced Students P2 Miloslava echová Miloslava echová (Gar.)	Z	2	0+2	L	V
04XNP3	German for Advanced Students P3 Miloslava echová Miloslava echová (Gar.)	Z	2	0+2	Z	V
04XRM1	Russian for Intermediate Students M1 Zhanna Isaeva Zhanna Isaeva (Gar.)	Z	2	0+2	Z	V
04XRM2	Russian for Intermediate Students M2 Zhanna Isaeva Zhanna Isaeva (Gar.)	Z	2	0+2	L	V
04XRM3	Russian for Intermediate Students M3 Zhanna Isaeva Zhanna Isaeva (Gar.)	Z	2	0+2	Z	V
04XRP1	Russian for Advanced Students P1 Zhanna Isaeva Zhanna Isaeva (Gar.)	Z	2	0+2	Z	V
04XRP2	Russian for Advanced Students P2 Zhanna Isaeva Zhanna Isaeva (Gar.)	Z	2	0+2	L	V
04XRP3	Russian for Advanced Students P3 Zhanna Isaeva Zhanna Isaeva (Gar.)	Z	2	0+2	Z	V
04XRZ1	Russian for Beginners Z1 Zhanna Isaeva Zhanna Isaeva (Gar.)	Z	2	0+4	L	V
04XRZ2	Russian for Beginners Z2 Zhanna Isaeva Zhanna Isaeva (Gar.)	Z	2	0+4	Z	V
04XRZ3	Russian for Beginners Z3 Zhanna Isaeva Zhanna Isaeva (Gar.)	Z	2	0+4	L	V

04XRZ4	Russian for Beginners Z4 Zhanna Isaeva Zhanna Isaeva (Gar.)	Z	2	0+4	Z	V
04XRZ5	Russian for Beginners Z5 Zhanna Isaeva Zhanna Isaeva (Gar.)	Z	2	0+4	L	V
04XSM1	Spanish for Intermediate Students M1 Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)	Z	2	0+2	Z	V
04XSM2	Spanish for Intermediate Students M3 Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)	Z	2	0+2	L	V
04XSM3	Spanish for Intermediate Students M3 Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)	Z	2	0+2	Z	V
04XSP1	Spanish for Advanced Students P1 Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)	Z	2	0+2	Z	V
04XSP2	Spanish for Advanced Students P2 Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)	Z	2	0+2	L	V
04XSP3	Spanish for Advanced Students P3 Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)	Z	2	0+2	Z	V
04XSZ1	Spanish for Beginners Z1 Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)	Z	2	0+4	L	V
04XSZ2	Spanish for Beginners Students Z2 Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)	Z	2	0+4	Z	V
04XSZ3	Spanish for Beginners Z3 Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)	Z	2	0+4	L	V
04XSZ4	Spanish for Beginners Z4 Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)	Z	2	0+4	Z	V
04XSZ5	Spanish for Beginners Z5 Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)	Z	2	0+4	L	V

Characteristics of the courses of this group of Study Plan: Code=BSPJAZYKYZAP Name=BS P jazyky zap

04XAM1 English for Intermediate Students M1

The course is designed for students who have successfully completed the full secondary school English language course at least at the A2 level of the Common European Framework of Reference for Languages (CEFR). It provides an introduction into English for Specific and Academic Purposes (ESP, EAP), i.e., into fundamentals of vocabulary and style typical of professional oral and written communication situations. Thus it covers topics related to the student's life and needs as well as topics of subtechnical interest. Attention is also paid to extending the knowledge of grammar issues used in EAP.

04XAM2 English for Intermediate Students M2

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The AM2 course expects the student to have completed the AM1 course. It develops their skills for work with subtechnical texts, focusing also more on specific grammar, functions, and lexical items typical of ESP and EAP (e.g., definition, existence and classification of phenomena, object descriptions). Part of the course is also guided writing. If necessary, grammar revision is included.

04XAM3 English for Intermediate Students M3

2

The course develops the skills that enable students to cope with features typical of professional style. Increasing attention is paid to developing subtechnical vocabulary and independent understanding of professional texts. Great emphasis is placed on distinguishing different levels of formal and informal oral and written communication and their appropriate Czech equivalents. The course 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 student's field.

04XAP1 English for Advanced Students P1

The course is at the level of advanced English, designed for students who have successfully completed the full secondary school English language course (at least to the B1 level of the Common European Framework of Reference for Languages - CEFR). It provides an introduction into English for Specific and Academic Purposes (ESP, EAP), providing insights into the fundamentals of vocabulary, grammar, and the purpose and style which is typical of academic and professional oral and written communication situations concerning science, technology, engineering and mathematics (STEM) contexts. There is an emphasis on reading material and discussing ideas with colleagues prior to participating in plenary sessions. Full and active participation is a basic expectation.

04XAP2 English for Advanced Students P2

The course is designed for students who have successfully completed AP1 and is a continuation of the Advanced English course. The AP2 course builds on content covered in AP1, thus extending the students skills for working with texts relating to science, technology, engineering and mathematics (STEM), and honing spoken and written communication in STEM contexts. The course extends the students academic vocabulary, through exposure to a wide variety of diverse texts and broadens knowledge of key aspects of grammar (referred to as Language Topics), pertinent to effective academic discourse and communication. There is a specific emphasis on responding to graphic data and the synthesizing of comprehensive and nuanced interpretations of such data. There is a focus on formal conventions in written communication including sentence and paragraph structure, discourse marking and cohesion. As in AP1, considerations of the purpose and concomitant style which is typical of academic and professional oral and written communication is explored through sample materials. And once again, students are expected to discuss ideas with colleagues prior to participating in plenary sessions. Full and active participation is a basic expectation.

04XAP3 English for Advanced Students P3

The AP3 course is designed for students who have successfully completed AP2 and is a continuation of the Advanced English course leading to a zápo et and a final graded examination. The AP3 course builds on content covered in both AP1 and AP2 and in terms of the final examinations, provides a summative assessment of the knowledge and skills acquired over the course of the three semesters. The AP3 course places greater emphasis on student participation, training oral communication skills, particularly when expressing an opinion, agreement, and objections in formal discussions. There is also focus on professional written communication in the context of applying for work placements and opportunities for further study. For most students this is their third year of studying for their bachelors degree and so there is a commitment to honing efficient and effective language skills with a view to enabling successful communication in English both in the academic context and in the wider world. Collaborating with colleagues to enable deeper understanding of complex ideas is a key goal.

04XCESZ1 Czech for Foreigners - Beginners 1

The course is designed for students of the English programme. Students will become acquainted with the main characteristics of Czech (phonetic and grammar features) and they will acquire basic language and speaking skills. The course focuses on pronunciation exercises, simple social phrases, and oral and written communication in the most common everyday situations. The course covers roughly lessons 1-3 of eština Express (Czech Express) by L. Holá and P. Bo ilová.

04XCESZ2 Czech for Foreigners - Beginners 2

The language and communication competences acquired in CESZ1 are further developed. Students deepen their knowledge of the declension and conjugation system and practise basic communication topics. The course covers roughly lessons 3-5 in Czech Express by L. Holá and P. Bo illová.

04XCESZ3	Czech for Foreigners - Beginners 3	Z	2
	lops the language and communication competences acquired in the XCESZ1 and XCESZ2 courses. The teaching focuses or ion and deepening grammar, features through practice, as well as introducing the Czech culture. Students are asked to produ		-
•	ie. They also practise understanding texts in terms of main ideas or looking for specific details in texts. The course covers roug	•	
1.			
	Czech for Foreigners - Intermediate 1	Z	2
	n correct pronunciation, important morphological phenomena, prepositional phrases, and verb forms as well as on extending the	e student's vocab	ulary for various
social situations. 04XCESM2	Czach far Faraignara Intermediate 2	Z	2
	Czech for Foreigners - Intermediate 2 topics covered in CESM1 and is then focused on more difficult grammar phenomena. It practices writing, speaking, and rear	ı	
•	on abbreviations, abbreviated words, and mathematical terms and formulas.	anig onino ana na	and the student
04XCESM3	Czech for Foreigners - Intermediate 3	Z	2
The last course revises	morphological topics covered earlier and extends the student's knowledge of more difficult language phenomena. It is especi	ally focused on s	tylistics and
	ping the student's writing skills.		
04XCESP1	Czech for Foreign Students - Advanced 1	Z	2
	ourse is very good knowledge of the Czech language, i.e., communicative competences at least at level B2 of the Common Eu vision of standard language structures, but mainly on practising more complex grammatical structures typical of the style of s	-	
· · · ·	e of engineering and professional communication, both in spoken and written form. The topics include University Studies and		-
	with teachers and faculty administrators.		
04XCESP2	Czech for Foreigners - Advanced 2	Z	2
This course extends the	student's knowledge acquired in CESP1 and focuses on difficult language phenomena. It practises working with technical ar	nd specialist texts	placing greater
emphasis on individual v			
04XCESP3	Czech for Foreigners - Advanced 3	Z	2
•	estudent's knowledge from CESP2. It includes working with authentic specialist materials, their interpretation and presentation as skills necessary for professional communication are trained.	n, and, finally, pre	esentation of the
<u> </u>	French for Intermediate Students M1	Z	2
- 1	M The objective of this three-semester course is to improve and further develop communication in the French language in bot	ı	
	cate in social interaction and in academic, scientific and professional environment. They will be able to use the language to tra		
information and to solve	problems. FM1 The course builds on and further develops linguistic competence acquired at secondary school. It revises, sy	stemizes and exp	ands language
	study. The following topics are covered: University studies in our country and in France, writing of transactional letters, CV, per		
	ure and geography, Paris. Topics of specialization: mathematics, physics. Reading technical and popular science texts, work		
	French for Intermediate Students M2	Z	2
	V1. Linguistic structures and competence acquired in previous study are systemized and expanded. Reading popular science to passives, nominalization, word formation). Topics: physics, power engineering, environment, Internet, success of French science.		
	chitects. Description of an object, device, shapes, dimensions, material.		.9,,
04XFM3	French for Intermediate Students M3	Z	2
The course is focused or	n improvement and further development of linguistic competence acquired during the follow-up courses. Syntactic structures (s	subordinate and ir	nfinitive clauses,
	npound tenses). Text summaryStudents prepare a written paper which will be delivered in form of an oral presentation in-cla		
	specialisation or to their interest and generally covers a technical /applied science topic. It is not a translation but a creative wa ge/experienceLonger monologues on topics /situations set for the examination are prepared. Text structure, cohesion and c	-	French articles
04XFP1	French for Advanced Students P1	Z Z	2
-	e objective of this three-semester course is to improve and further develop communication in the French language in both wri		_
	in social interaction and in academic, scientific and work environment. They will be able to use the language to transmit gene		
to solve problems. FP1 T	he course builds on and further develops linguistic competence acquired at secondary school. Difficult grammar topics are re	peated and expar	nded: subjonctif,
	it, pronouns. The following specific topics are covered: University studies in our country and in France, writing of transactional		<i>'</i>
•	vert, environmental issues, success of French science and technology, chosen topics from French regional culture, Paris. Topic	cs of specializatio	n: mathematics,
	stry. Reading of technical and popular science texts, further work with these texts and interpretation. French for Advanced Students P2	Z	2
	ints, the course further develops language skills. Focus is put on reading popular science texts and on oral communication or	ı	
	communication are stressed (passive voice, nominalization, word formation).		,,
04XFP3	French for Advanded Students P3	Z	2
	n systemization and improvement of acquired linguistic competence, skills and knowledge, and their use for communication in		
	ter texts (both from and into the language). Writing of a paper and making oral presentation in-class. The paper generally covered to the control of the con	ers a technical /a	pplied science
· · · · · · · · · · · · · · · · · · ·	k compiled from 3 French sources. Preparation of several set topics for oral examination.	7	2
	French for Beginners Z1 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	Z ocializing and in a	
-	nch for specific / technical communication and reading of popular science and scientific texts. FZ1 The objective is to be able	-	
level, actively using the l	knowledge of chosen elementary language. The contents is roughly outlined by lessons 1 - 7 of the textbook Pravda - Pravdo	vá, French for be	ginners
	te ky). It is extended with situations of communication and functions from the textbook Espaces I, lessons 1-4: introductions,	-	-
	ple instructions and questions. Special attention is paid to pronunciation. Spelling is explained in connection with pronunciation.		
	French for Beginners Z2	Z	da Pravdová :
<u> </u>	with FZ1. Elementary linguistic knowledge and communication skills are expanded. The scope is given by lessons 8 - 13 of the dditional topics and skills are filled in from the textbook Espaces I, lesson 1 - 5 (introductions, invitation, welcoming, agreeme		
-	of France, food, expression of will, wish, order, prohibition, pleasure). Correct pronunciation is practiced. Stress on oral community, agreement of the control of the con	_	
	work? A few expressions concerning the study. Name of University and Faculty.	· 	·
04XFZ3	French for Beginners Z3	Z	2
· ·	TZ2. Basic linguistic knowledge and skills are developed. The contents is given by lessons 14 - 18 of the textbook: Pravda - P		-
•	uations are complemented from other materials. Stress is put on oral communication in dialogues and on reading, both for int	ormation and lou	as part of
pronunciation practice. F	Reading covers short adapted texts of general interest first, and later popular science texts.		

04XFZ4	French for Beginners Z4	Z	2
-	FZ3. Basic linguistic knowledge and skills are further developed. Oral communication and reading skills are practiced. The c		
	tbook French for Beginners, and is expanded with topics and functions from other materials. Reading is developed from the lec ourse covers generals and specific topics: health- illness, sport, free time, environment, study, travelling in France, Paris, shop		0 0
	now to write CV, application, topics in mathematics, reading physics - mechanics, informatics, internet.	ping, ireairei, ai	o.o.iy ou.
04XFZ5	French for Beginners Z5	Z	2
· · · · · · · · · · · · · · · · · · ·	FZ4 are further developed, as well as technical language. Students prepare a paper on a chosen popular science topic. The		
•	ered by lessons 24 - 26 of the textbook: Pravda-Pravdova, French for Beginners, and is complemented from other materials. The control of the complement of t		
notes, success of Frenc subjunctive clauses, ger	h science and technology, information about France. Grammar is systemized and complemented with syntax (subordinate cla und passive	iuses, typicai con	junctions,
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	l l	
the world at the beginning	ng of the 21st century, linguistically more demanding texts on the environment, the language of mathematics, computers and	car technology ef	tc. Students
-	mation and reading aloud, and appropriate language for various purposes in oral and written communication. The course system	natically revises ot	her grammatical
· · · · · · · · · · · · · · · · · · ·	or professional discourse (participles, relative clauses).	7	
04XNM1	German for Intermediate Students M1 rse is to level off the students' skills in the German language. The course focuses on revision of more difficult phenomena and	Z	he 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		
terminology. It develops	communication on related topics and is aimed at correct pronunciation, grammatical correctness and understandability.		
04XNM3	German for Intermediate Students M3	Z	2
	ther more complex grammatical structures and their application in communication based on technical texts, such as the relation		٠, , ,
•	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).	ialioally rovided of	or grammanear
04XNP1	German for Advanced Students P1	Z	2
This course requires go	od grammar knowledge, extended general vocabulary, and good communication skills acquired at secondary school to be lev	elled off at the be	eginning of the
	en focused on working with technical and scientific texts and practising reading techniques (skimming, scanning, reading for	•	
more difficult grammar st i.e., telephoning.	ructures necessary for understanding a subtechnical text (passive voice, participles, participle structures) and it also focuses on participles.	oractical everyday	communication,
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		
<u> </u>	V, letter of application, interview, scholarship), and more complex grammatical structures (i.e., subjunctive, indirect speech).		
04XNP3	German for Advanced Students P3	Z	2
	B main parts (general communicative situations, grammar and technical topics). Students will develop their vocabulary in a va r accidents, accident report, filling in a form, complaints). Based on presentations and technical and subtechnical texts, the vo	-	
•	ng, the environment, computer science, and car technology, will also be extended. Only authentic professional texts are used	, ,	
	rocess information gained from their reading of complex and difficult texts and present it to the class in a simplified oral form. The		
practice to and from Ge			
04XRM1	Russian for Intermediate Students M1	Z	2
•	for students with previous knowledge of Russian from secondary schools. Students are supposed to know the Russian alphab nmunication in everyday situations (introductions, socializing, greetings, shopping for food and objects of everyday need, aski		· ·
	immediated in everyady statations (infroductions, socializing, greetings, shopping for food and objects of everyady freed, askinimar structures (verbal and nominal forms, irregular verbs, pronouns). The initial knowledge corresponds to the achievement		
,	ne course correspond approximately to the RZ3 course, but for half of the time allotted in the timetable.		
04XRM2	Russian for Intermediate Students M2	Z	2
	the RM1 course, its contents and scope correspond roughly to RZ4, however, for half of the time allotted in the timetable.		
04XRM3	Russian for Intermediate Students M3	Z	2
in the timetable.	eknowledge and skills acquired in RM1 and RM2 and its contents and scope are roughly at the same level as those of RZ5, ho	wever, for half of	the time allotted
04XRP1	Russian for Advanced Students P1	Z	2
	nt for the course is to achieve the B1 CEFR level. The objective of the course is revision of standard language structures, pra	ı	
structures, understandir	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
04XRP3	ton independent oral and written communication.	Z	2
	Russian for Advanced Students P3 RP2 and is mainly focused on working with technical and scientific texts (reading comprehension, oral and written paraphras	ı	
	evious knowledge of general language at secondary level (listening, reading, correct communication in everyday situations).		
these skills. Further stud	ly is aimed at professional and technical skills (reading technical literature according to the students' specialization, oral and	written interpreta	tion). Students
•	al vocabulary and practice quick and correct communication in professional situations. They will be able to both speak write a	ccurately and wit	h confidence on
technical topics.	Puesian for Paginnare 71	7	2
04XRZ1 The course represents t	Russian for Beginners Z1 he first stage of the five-semester programme, its final aim being reading and understanding professional texts written in Russ	Z sian. Thus it begins	
•	or both reading and writing skills) and fundamentals of grammar necessary for everyday communication (listening and speaki	_	- 1
	stress, understand its contents and summarize it.		
04XRZ2	Russian for Beginners Z2	Z	2
	the programme is designed to teach skills for basic communication in everyday situations and for reading easy and short su		
	ing short sentences and appropriate structures, and read aloud with confidence a short text without marked stress. They will ical structures. They will have mastered with confidence the Russian alphabet and will be able to use it in writing.	also develop their	vocabulary and
si anoi grammat			

04XR73 Russian for Beginners Z3 The course is based on RZ2 and includes further everyday topics, develops understanding of short compact texts on new subtechnical topics (for training various forms of reading skills and listening) and introduces new grammar. Students will be trained to distinguish intonation patterns while listening to spoken language. They will be able to respond so as to be understood, and to express their opinion. Writing skills will be trained on guided writing tasks and note-taking. Russian for Beginners Z4 The course is based on RZ3. It improves and expands the knowledge of general language in all four skills (reading and understanding longer texts with a certain percentage of unfamiliar words, oral communication in everyday situations, writing longer texts). Students are trained to use grammar structures effectively (e.g., irregular verbs, differences in verb patterns from Czech, modality, imperatives, conditionals). They practice and develop communication skills for everyday situations (food, travelling, free time), and practice oral and written communication on more specific topics (environment, addictions, the green movement). They become acquainted with various geographical data (e.g., Siberia), learn how to fill in forms, look up the information from the timetable, learn about Russian holidays and typical meals. 04XRZ5 Russian for Beginners Z5 The course expects the student to have completed RZ4. It concentrates predominantly on reading skills (working with professional texts, i.e. understanding, extracting and summarizing information from a specialized text) and speaking, and to a certain extent, writing about the professional information obtained by reading the texts. Communication skills are trained on everyday topics. Studying grammar is based on professional and technical texts and only includes items typically used in professional communication (verbal adjectives, participles, passive voice). Students develop their technical and economic vocabulary, and are also trained in some professional skills (writing a CV, polite request, etc.) Spanish for Intermediate Students M1 04XSM1 The course is designed for students whose competence is at level B1 of CEFR, i.e. those who studied Spanish in the secondary school. The 3-semester course develops standard vocabulary and pays attention to further grammar topics, to written and oral communication on a given everyday or easy subtechnical topic, for which the students are trained by reading texts or listening to them. 04XSM2 Spanish for Intermediate Students M3 The course develops the students' knowledge from the previous course (XSM1). Students are gradually acquainted with fundamentals of Spanish for specific purposes in order to be able to work with specialized texts on the Internet. 04XSM3 Spanish for Intermediate Students M3 2 The course books are supplemented with additional subtechnical materials, so the students will be gradually acquainted with the peculiarities of academic style. They will be competent enough to use the Internet in Spanish and search for information of their specialization or field of interest. Students will use the information to write short articles and summaries. The final part of the programme, general Spanish course based on course books, covers presentations and, finally, a written and oral examination. 04XSP1 Spanish for Advanced Students P1 Course concentrates on more difficult grammar topics, revision of vocabulary, basics of Spanish for specific purposes as well as written communication. Course prerequisites: level B2 of CEFR. 04XSP2 Spanish for Advanced Students P2 2 Course XSP2 is the second part of the advanced Spanish course, extending Spanish for specific purposes topics. It comprises more grammar and syntax and focuses on independent written communication. 04XSP3 Spanish for Advanced Students P3 7 Course XSP3 is the final part of the advanced Spanish course. It is based on texts chosen by the students according to their future specialization. It is focused on written communication based on what students will need in their career. 04XSZ1 Spanish for Beginners Z1 Course XSZ1 is the first stage of the five-semester programme of Spanish studies; during the first stage the students will master phonetics and fundamental grammar structures and will be able to communicate at an elementary level on topics of everyday life. They will acquire and extend fundamental vocabulary of general Spanish and will develop it. Spanish for Beginners Students Z2 Course XSZ2 is based on course XSZ1, and expects students to develop and extend the knowledge and skills acquired so far. Grammar structures and lexis will be chosen so as to enable them to understand short adapted written texts and speech. Attention is also paid to cultural differences between Spanish-speaking countries and others such as the Czech Republic. Realia of Spanish-speaking countries are also included. 04XSZ3 Spanish for Beginners Z3 This course builds upon the foundations established in course XSZ2 and further develops students vocabulary and grammatical competence. It includes an introduction to the realia and cultural context of Spanish-speaking countries, with a primary focus on Spain. Particular attention is given to key grammatical structures, including the pretérito perfecto, pretérito indefinido, pretérito imperfecto, the gerund, and the imperative. The course also focuses on both written and spoken communication on general topics. Students are prepared for this through targeted reading and listening activities. 04XSZ4 Spanish for Beginners Z4 The course is based on course XSZ3. It develops the student's vocabulary and extends the knowledge of the culture and social customs of the Spanish speaking countries, mainly of Spain. It pays attention to further grammar topics (perifrasis verbales, futuro imperfecto, direct object and indirect object pronouns, negative form of the imperative, and subjunctive), to written and oral communication on a given general or subtechnical topic, for which the student is trained by reading texts or listening to them. Spanish for Beginners Z5 The course books are supplemented with additional subtechnical materials, so the students will be gradually acquainted with peculiarities of Spanish for specific purposes. In its final part, the general Spanish course based on the course book will end with a written and oral examination.

List of courses of this pass:

Code	Name of the course	Completion	Credits
00EKOT	Economy in Technology	Z	1
'	The course introduces the basics of micro- and macroeconomics.		,
00ETV	Ethics of Science and Technology	Z	1
00MAM1	Essentials of High School Course 1	Z	1
'	Students are introduced to mathematical concepts and methods used in the introductory physics course.		,
00MAM2	Essentials of High School Math Course 2	Z	1
The course introdu	ces the fundamental areas of mathematics essential for university studies and practical applications. It covers sets, logic, proofs, fu	inctions, derivatives	, integrals,
	analytic geometry, combinatorics, and probability, with emphasis on understanding principles, rigor, and problem solving		

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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		
00UPRA	nonverbal aspects. Stylistics exercises, strategies for coping with stage-fright and a short excursion into the history of rhetoric are an Introduction to Law	Z	1
00UPSY		Z	1
	Introduction to Psychology Calculus B 3	Z,ZK	
01ANB3	Calculus b 3 quences and series - convergence range, criteria of uniform convergence, continuity, limit, differentiation and integration of functional		8 Series
	r's theorem. 2. Ordinary differential equations - equations of first order (method of integration factor, equation of Bernoulli, separation	•	
equation and exact	equation) and equations of higher order (fundamental system, reduction of order, variation of parameters, equations with constant coeff	ficients and specia	al right-hand
	tial equation). 3. Quadratic functions and quadrics. 4. Metric spaces - metric, norm, scalar product, neighborhood, interior and exterior p		
· ·	pint, boundary of set, completeness of space, Hilbert spaces. Orthogonal polynomials. Complete orthogonal systems. 5. Differential constitution and transfer and directional derivative, gradient, total derivatives and transfer along 6. Toylor period for functions of account veriable		
variables - Ilmit, co	ontinuity, partial and directional derivative, gradient, total derivatives and tangent plane. 6. Taylor series for functions of several variable analysis, Jacobi matrix.	es. 7. Fundamenta	iis in vector
01ANB4	Calculus B 4	Z,ZK	6
	d functions. [2] Regular mapping, transformation of coordinates, non-cartesian coordinate systems. [3] Local, constrained, and global		
=	bles. [4] Basics of the measure theory, and construction of the Lebesgue measure. [5] Integral calculus of functions of several indeper		
Lebesgue integrals	, basic properties, theorem of Fubini, substitution theorem, theorems of Levi and Lebesgue. Limit, continuity and differentiability of par	rametric integrals.	[6] Line and
01LAL	surface integrals. Integral theorems.	Z	2
	Linear Algebra 1 Linear dependence and independence. 3. Basis and dimension. 4. Subspaces of vector spaces. 5. Linear mappings. 6. Matrices of li		
1. 100101 00400.2	theorem.	noar mappingo. 7.	rioboliido
01LAL2	Linear Algebra 2	Z,ZK	4
	se matrix and operator. 2. Permutation and determinant. 3. Spectral theory (eigenvalue, eigenvector, diagonalization). 4. Hermitian and	'	5. Scalar
	ponality. 6. Metric geometry. 7. Riesz theorem and adjoint operator. Outline of the exercises: 1. Methods for calculation of inverse matri		II.
of determinants.	3. Calculation of eigenvalues and eigenvectors. 4. Hermitian and quadratic forms. Canonical form. 5. Scalar product and orthogonality	y. Calculation of or	rthogonal
01LALZ	complements. 6. Geometry exercises and examples. 7. Adjoint operators. Linear Algebra 1, exam	ZK	2
01MAN	Calculus 1	Z	4
OTIVIAIN	Basic calculus (real analysis, functions of one real variable, differential calculus).	2	'
01MAN2	Calculus 2	Z,ZK	8
1. Continuation of	differential calculus: Taylor's Polynomials, Taylor's formula 2. Infinite series: criteria of convergence, operations on series, absolute ar		vergence 3.
Real and complex p	power series, the Cauchy-Hadamard theorem, expansion of function into power series, summation of infinite series. 4. Theory of integr	ale: primitivae dafi	inite integral
		ais. primitives, den	
	(Riemann definition), techniques of integration and application of integrals, Generalized Riemann integral		_
01MANZ	(Riemann definition), techniques of integration and application of integrals, Generalized Riemann integral Calculus 1, exam	ZK	4
01MANZ 01PRST	(Riemann definition), techniques of integration and application of integrals, Generalized Riemann integral Calculus 1, exam Probability and Statistics	ZK Z,ZK	4 4
01MANZ 01PRST It is a basic course	(Riemann definition), techniques of integration and application of integrals, Generalized Riemann integral Calculus 1, exam	ZK Z,ZK continuing till the K	4 4 (olmogorov
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02PRA1 Experimental Laboratory 1 ΚZ 6 Lecture is intended especially for students who intend to study some of the physical specializations of FNSPE(branch Physical Engineering, Nuclear Engineering). But it can be also attended by students interested in the otherspecializations. In Experimental laboratory students learn how to prepare for experiments (including work with theliterature), the implementation of the measurement (acquire of different experimental procedures and routines), willteach writing the records of measurement, processing and evaluation of results. At the same time practically extendthe knowledge gained in lectures on physics. 02PRA2 Experimental Laboratory 2 K7 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. 02TEF1 Theoretical Physics 1 The course is an introduction to analytical mechanics. The students acquire knowledge of the basic concepts of the Lagrange and Hamiltonian formalisms as well as diferent approaches to description of dynamics (Newtons, 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). 02TER Heat and Molecular Physics Z,ZK Thermal expansion of materials, heat transfer; stationary and non-stationary heat conduction, heat transfer and penetration; 1st and 2nd thermodynamic principle, ideal and real gas, entropy; non-chemical systems: dielectric and magnetic materials; Maxwell relations and thermodynamic potentials; kinetic theory: Maxwell's velocity distribution,equipartition theorem. Thermodynamics and Statistical Physics Foundation of thermodynamics and statistical physics. Thermodynamic potential, the Joule Thomson effect, conditions of equilibrium, the Braun-Le Chatelier principle. Statistical entropy. Basics of many body descriptionfrom a statistical point of view (classical and quasiclassical regime within the frame of a canonical and grand-canonical ensemble, Fermi gas, models of crystals and the black body radiation). The Boltzmann equation is used to discusses simple transport phenomena. Introduction to Elementary Particle Physics The course provides an easily accessible introduction to elementary particle physics. Development, methods, goals and perspectives of the subject are presented. 02VOAF Waves, Optics and Atomic Physics 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 to quantum 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. 02ZM1 Foundations of Physical Measurements 1 7K The lecture is designed for students of physical specializations (Experimental particle physics, Physical engineering, Nuclear engineering), however, it can be attended by students of other branches. The goal of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired data on a PC. Students learn the basic habits of work in a physics lab. 02ZM2 ΚZ Foundations of Physical Measurements 2 The course is designed for students of physical specializations FNSPE (Nuclear and Particle Physics, Physical engineering, Nuclear engineering), however, it can be attended by students of other branches. The goal of the course is to practically introduce students to the basics of physical measurements of the most important quantities, the methods of processing and evaluation of acquired data on a PC. Students learn the basic habits of work in a physics lab. 04AKS **English Conversation** Ζ The course will develop the student's communication skills acquired throughout their previous studies. It aims to improve all aspects of oral communication. The student will develop their vocabulary for various communication situations and will master their communication strategy. They will also practise their listening skills in order to better follow and participate in discussions. The student will be trained to express their ideas clearly and according to current English usage, and become a more confident speaker. 04XAM1 English for Intermediate Students M1 The course is designed for students who have successfully completed the full secondary school English language course at least at the A2 level of the Common European Framework of Reference for Languages (CEFR). It provides an introduction into English for Specific and Academic Purposes (ESP, EAP), i.e., into fundamentals of vocabulary and style typical of professional oral and written communication situations. Thus it covers topics related to the student's life and needs as well as topics of subtechnical interest. Attention is also paid to extending the knowledge of grammar issues used in EAP. 04XAM2 English for Intermediate Students M2 The AM2 course expects the student to have completed the AM1 course. It develops their skills for work with subtechnical texts, focusing also more on specific grammar, functions, and lexical items typical of ESP and EAP (e.g., definition, existence and classification of phenomena, object descriptions). Part of the course is also guided writing. If necessary, grammar revision is included. 04XAM3 English for Intermediate Students M3 Ζ 2 The course develops the skills that enable students to cope with features typical of professional style. Increasing attention is paid to developing subtechnical vocabulary and independent understanding of professional texts. Great emphasis is placed on distinguishing different levels of formal and informal oral and written communication and their appropriate Czech equivalents. The course 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 student's field. 04XAMZK English for Intermediate Students Examination The course content is the examination as given by the study plan. The examination covers the AM1, AM2, and AM3 courses and consists of two parts - written (100 min) and oral (20-30 min). The student is expected to master the AM syllabus and demonstrate the ability to apply their knowledge gained in the three English courses. 04XAP1 English for Advanced Students P1 The course is at the level of advanced English, designed for students who have successfully completed the full secondary school English language course (at least to the B1 level of the Common European Framework of Reference for Languages - CEFR). It provides an introduction into English for Specific and Academic Purposes (ESP, EAP), providing insights into the fundamentals of vocabulary, grammar, and the purpose and style which is typical of academic and professional oral and written communication situations concerning science, technology, engineering and mathematics (STEM) contexts. There is an emphasis on reading material and discussing ideas with colleagues prior to participating in plenary sessions. Full and active participation is a basic expectation. 04XAP2 English for Advanced Students P2 The course is designed for students who have successfully completed AP1 and is a continuation of the Advanced English course. The AP2 course builds on content covered in AP1, thus extending the students skills for working with texts relating to science, technology, engineering and mathematics (STEM), and honing spoken and written communication in STEM contexts. The course extends the students academic vocabulary, through exposure to a wide variety of diverse texts and broadens knowledge of key aspects of grammar (referred to as Language Topics), pertinent to effective academic discourse and communication. There is a specific emphasis on responding to graphic data and the synthesizing of comprehensive and nuanced interpretations of such data. There is a focus on formal conventions in written communication including sentence and paragraph structure, discourse marking and cohesion. As in AP1, considerations of the purpose and concomitant style which is typical of academic and professional oral and written communication is explored through sample materials. And once again, students are expected to discuss ideas with colleagues prior to participating in plenary sessions. Full and active participation is a basic expectation.

The AP3 course b	English for Advanced Students P3 designed for students who have successfully completed AP2 and is a continuation of the Advanced English course leading to a zápo et a uilds on content covered in both AP1 and AP2, and in terms of the final examinations, provides a summative assessment of the know e three semesters. The AP3 course places greater emphasis on student participation, training oral communication skills, particularly we	ledge and skills ac	quired over
study. For most stu	ejections in formal discussions. There is also focus on professional written communication in the context of applying for work placemen dents this is their third year of studying for their bachelors degree and so there is a commitment to honing efficient and effective languag nunication in English both in the academic context and in the wider world. Collaborating with colleagues to enable deeper understandi goal.	ge skills with a view	to enabling
04XAPZK	Ţ Ţ	ZK	4
	English for Advanced Students Examination		=
	ent is the examination as given by the study plan. The student is supposed to demonstrate mastering the 04XAP3 syllabus and the ab ee 04XAP courses. In addition to passing courses 04XAP1, 04XAP2, and 04XAP3, a prerequisite for taking the exam is a presentatio student's field. The examination consists of 2 parts - written and oral.		_
041/050144		7	
04XCESM1 The course is focus	Czech for Foreigners - Intermediate 1 sed on correct pronunciation, important morphological phenomena, prepositional phrases, and verb forms as well as on extending the st social situations.	Z tudent´s vocabulary	2 y for various
04XCESM2	Czech for Foreigners - Intermediate 2	Z	2
The course develo	ops the topics covered in CESM1 and is then focused on more difficult grammar phenomena. It practices writing, speaking, and reading in understanding common abbreviations, abbreviated words, and mathematical terms and formulas.	ng skills and trains	
04XCESM3	Czech for Foreigners - Intermediate 3	Z	2
	revises morphological topics covered earlier and extends the student's knowledge of more difficult language phenomena. It is especially lexicology and on developing the student's writing skills.	ally focused on styl	istics and
04XCESMZK	Czech for Intermediate Students Examination	ZK	4
The course conte	nt is the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of the CES be taken after successful completion of the 3 courses. Detailed information is to be obtained from the teacher.	M1,2,3 courses an	d can only
04XCESP1	Czech for Foreign Students - Advanced 1	Z	2
The prerequisite of	the course is very good knowledge of the Czech language, i.e., communicative competences at least at level B2 of the Common Europe	bean Framework of	Reference.
It is focused partly	y on revision of standard language structures, but mainly on practising more complex grammatical structures typical of the style of sci	ence. Students are	taught the
	nal style of engineering and professional communication, both in spoken and written form. The topics include University Studies and \$		
	includes communication with teachers and faculty administrators.		
04VCESD2	·	7	2
04XCESP2	Czech for Foreigners - Advanced 2	_	
This course extend	ds the student's knowledge acquired in CESP1 and focuses on difficult language phenomena. It practises working with technical and	specialist texts plac	cing greater
	emphasis on individual work.		
04XCESP3	Czech for Foreigners - Advanced 3	Z	2
The course develo	ps the student's knowledge from CESP2. It includes working with authentic specialist materials, their interpretation and presentation,	and, finally, present	tation of the
	student's project. Writing skills necessary for professional communication are trained.		
04XCESPZK		ZK	4
			-
The course conte	ent is the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of the CES	SP1,2,3 Courses an	d can only
	be taken after successful completion of the 3 courses. Detailed information is to be obtained from the teacher.	· · · · · · · · · · · · · · · · · · ·	
04XCESZ1	Czech for Foreigners - Beginners 1	Z	2
The course is desi	gned for students of the English programme. Students will become acquainted with the main characteristics of Czech (phonetic and g	rammar features) a	and they will
acquire basic lang	uage and speaking skills. The course focuses on pronunciation exercises, simple social phrases, and oral and written communication	in the most commo	on everyday
	situations. The course covers roughly lessons 1-3 of eština Express (Czech Express) by L. Holá and P. Bo ilová.		
04XCESZ2	Czech for Foreigners - Beginners 2	Z	2
	d communication competences acquired in CESZ1 are further developed. Students deepen their knowledge of the declension and cor		
ino languago am	basic communication topics. The course covers roughly lessons 3-5 in Czech Express by L. Holá and P. Bo ilová.	naganon oyotom a	p.ao.ioo
041/05070		7	-
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		-
	unciation and deepening grammar, features through practice, as well as introducing the Czech culture. Students are asked to produce	-	
frequent types of d	ialogue. They also practise understanding texts in terms of main ideas or looking for specific details in texts. The course covers roughly	lessons 5-7 in es	stina expres
0.070=0===	1.		
04XCESZZK		ZK	4
The course conte	ent is the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of the 04X	CESZ1,2,3 course	s and can
	only be taken after successful completion of all three courses. Detailed information is to be obtained from the teacher.		
04XFM1	French for Intermediate Students M1	Z	2
	ı ate FM The objective of this three-semester course is to improve and further develop communication in the French language in both v	vritten and oral forr	
	ommunicate in social interaction and in academic, scientific and professional environment. They will be able to use the language to tra		
	solve problems. FM1 The course builds on and further develops linguistic competence acquired at secondary school. It revises, systematically secondary school is the course builds on and further develops linguistic competence acquired at secondary school. It revises, systematically secondary school is the course builds on an acquired at secondary school is the course builds on an acquired at secondary school is the course builds on an acquired at secondary school is the course builds on a course builds on a course build school is the course build school is	=	
	vious study. The following topics are covered: University studies in our country and in France, writing of transactional letters, CV, persor		
- :			
	French culture and geography, Paris. Topics of specialization: mathematics, physics. Reading technical and popular science texts, wo		
04XFM2	French for Intermediate Students M2	Z	2
	on FM1. Linguistic structures and competence acquired in previous study are systemized and expanded. Reading popular science text		
and scientific la	nguage (passives, nominalization, word formation). Topics: physics, power engineering, environment, Internet, success of French scie scientists, artists and architects. Description of an object, device, shapes, dimensions, material.	nce and technolog	y, French
04XFM3	French for Intermediate Students M3	Z	2
		l l	
	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-classical delivered in-classical del		
	uture specialisation or to their interest and generally covers a technical /applied science topic. It is not a translation but a creative work		
and on	e's own knowledge/experienceLonger monologues on topics /situations set for the examination are prepared. Text structure, cohesi	on and coherence.	
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 o		amination
	consists of a written and oral part and is organized according to Examination Instructions, a document available on the wel		
	,		

04XFP1 French for Advanced Students P1	Z 2
FP advanced course The objective of this three-semester course is to improve and further develop communication in the French language in both written be able to communicate in social interaction and in academic, scientific and work environment. They will be able to use the language to transmit general a	
o solve problems. FP1 The course builds on and further develops linguistic competence acquired at secondary school. Difficult grammar topics are repeat	
passé composé-imparfait, pronouns. The following specific topics are covered: University studies in our country and in France, writing of transactional lett	ers, CV, personal statement,
request, answer to an advert, environmental issues, success of French science and technology, chosen topics from French regional culture, Paris. Topics of	specialization: mathematics,
internet, physics, chemistry. Reading of technical and popular science texts, further work with these texts and interpretation.	Z 2
04XFP2 French for Advanced Students P2 With the link to P1 contents, the course further develops language skills. Focus is put on reading popular science texts and on oral communication on giv	
technical and scientific communication are stressed (passive voice, nominalization, word formation).	on topicon i datales typical of
04XFP3 French for Advanded Students P3	Z 2
The course is focused on systemization and improvement of acquired linguistic competence, skills and knowledge, and their use for communication in engin	•
skill - translation of shorter texts (both from and into the language). Writing of a paper and making oral presentation in-class. The paper generally covers topic. It is a creative work compiled from 3 French sources. Preparation of several set topics for oral examination.	a technical /applied science
04XFPZK French for Advanced Students Examination	ZK 4
The whole French program is ended with an examination covering the contents of FP1-FP3. The examination consists of a written and/or an oral part and	
Examination Instructions, a document available on the web. Assessment of the presentation is included into the examination grad	ding.
04XFZ1 French for Beginners Z1	Z 2
French for beginners The objective of this 5-level course is to be able to communicate in French orally and in writing in situations of everyday life, in socia The course includes French for specific / technical communication and reading of popular science and scientific texts. FZ1 The objective is to be able to	• •
level, actively using the knowledge of chosen elementary language. The contents is roughly outlined by lessons 1 - 7 of the textbook Prayda - Praydo	•
Francouzština pro za áte ky). It is extended with situations of communication and functions from the textbook Espaces I, lessons 1-4: introductions, pers	-
giving the directions, simple instructions and questions. Special attention is paid to pronunciation. Spelling is explained in connection with pronunciation.	<u>_</u>
04XFZ2 French for Beginners Z2	Z 2
The course is linking up with FZ1. Elementary linguistic knowledge and communication skills are expanded. The scope is given by lessons 8 - 13 of the to French for Beginners. Additional topics and skills are filled in from the textbook Espaces I, lesson 1 - 5 (introductions, invitation, welcoming, agreemen	
hanking, travelling, map of France, food, expression of will, wish, order, prohibition, pleasure). Correct pronunciation is practiced. Stress on oral communication	
How does the machine work? A few expressions concerning the study. Name of University and Faculty.	
04XFZ3 French for Beginners Z3	Z 2
The course builts upon FZ2. Basic linguistic knowledge and skills are developed. The contents is given by lessons 14 - 18 of the textbook: Pravda - Prav	-
Topics, functions and situations are complemented from other materials. Stress is put on oral communication in dialogues and on reading, both for infor pronunciation practice. Reading covers short adapted texts of general interest first, and later popular science texts.	mation and loud as part of
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 control	ents is roughly covered with
essons 19 - 23 of the textbook French for Beginners, and is expanded with topics and functions from other materials. Reading is developed from the lecture	
Students of FJFI. The course covers generals and specific topics: health- illness, sport, free time, environment, study, travelling in France, Paris, shoppin country and in France, how to write CV, application, topics in mathematics, reading physics - mechanics, informatics, internet	-
04XFZ5 French for Beginners Z5	Z2
All four skills acquired in FZ4 are further developed, as well as technical language. Students prepare a paper on a chosen popular science topic. They pre	I
general contents 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 clau subjunctive clauses, gerund, passive.	ises, typical conjunctions,
04XFZZK French for Beginners Examination	ZK 3
The content is the examination as given by the study plan. The course is terminated with an examination consisting of oral and written part. The examinat	l l
Instruction for examination. Its content covers the levels FZ1 - FZ5.	
04XNM1 German for Intermediate Students M1	Z 2
The objective of the course is to level off the students' skills in the German language. The course focuses on revision of more difficult phenomena and struword formation processes (e.g. importance of verb prefixes). In the lexical part, it covers topics referring to higher education in both the Czech Repub	
environmental issues together with all necessary expressions and phrases, expressions and phrases needed to chemists, mathematicians, physicists, a	• • • • • • • • • • • • • • • • • • • •
terminology. It develops communication on related topics and is aimed at correct pronunciation, grammatical correctness and understa	andability.
04XNM2 German for Intermediate Students M2	Z 2
The course introduces other more complex grammatical structures and their application in communication based on technical texts, such as the relation betoever the world at the beginning of the 21st century, linguistically more demanding texts on the environment, the language of mathematics, computers and careful at the beginning of the 21st century, linguistically more demanding texts on the environment, the language of mathematics, computers and careful at the beginning of the 21st century, linguistically more demanding texts on the environment, the language of mathematics, computers and careful at the beginning of the 21st century, linguistically more demanding texts on the environment, the language of mathematics, computers and careful at the beginning of the 21st century, linguistically more demanding texts on the environment, the language of mathematics, computers and careful at the beginning of the 21st century, linguistically more demanding texts on the environment, the language of mathematics, computers and careful at the beginning of the 21st century, linguistically more demanding texts on the environment, the language of mathematics, computers and the careful at the beginning of the 21st century.	
practise reading for information and reading aloud, and appropriate language for various purposes in oral and written communication. The course systematical	 -
phenomena important for professional discourse (participles, relative clauses).	,
04XNM3 German for Intermediate Students M3	Z 2
The course introduces other more complex grammatical structures and their application in communication based on technical texts, such as the relation between the resolution of the course of the CO to continue the relation between the resolution of the course of the co	
the world at the beginning of the 21st century, linguistically more demanding texts on the environment, the language of mathematics, computers and ca practise reading for information and reading aloud, and appropriate language for various purposes in oral and written communication. The course systematica	
phenomena important for professional discourse (participles, relative clauses).	,
04XNMZK German for Intermediate Students Examination	ZK 4
The course content is the examination as given by the study plan. The whole German for Intermediate Students Course is completed by an examination co	
and oral, which cover the courses NM1 - NM3. The oral part follows after passing the written part successfully and after obtaining the 04NM3 assessmer is to be obtained from the teacher.	it. iviore detailed information
04XNP1 German for Advanced Students P1	Z 2
This course requires good grammar knowledge, extended general vocabulary, and good communication skills acquired at secondary school to be levelle	Į.
course. The course is then focused on working with technical and scientific texts and practising reading techniques (skimming, scanning, reading for det	·
nore difficult grammar structures necessary for understanding a subtechnical text (passive voice, participles, participle structures) and it also focuses on pract	ical everyday communication,
i.e., telephoning.	

04XNP2	German for Advanced Students P2	Z	2
	es the students' skills in working with professional scientific texts (understanding, summarising, note-taking, interpreting) while extending t introduces mathematical expressions and texts of nuclear power engineering. Increasing emphasis is placed on understanding and pra	•	
· -	oth written and oral (CV, letter of application, interview, scholarship), and more complex grammatical structures (i.e., subjunctive, indi	_	numeation,
04XNP3	German for Advanced Students P3	Z	2
	sts of 3 main parts (general communicative situations, grammar and technical topics). Students will develop their vocabulary in a varient of a main form, complaints). Based on presentations and technical and subtechnical texts, the voca	=	
nuclear power en	gineering, the environment, computer science, and car technology, will also be extended. Only authentic professional texts are used.	By means of a pres	sentation,
students are traine	d to process information gained from their reading of complex and difficult texts and present it to the class in a simplified oral form. The c practice to and from German.	ourse also includes	translation
04XNPZK	German for Advanced Students Examination	ZK	4
	t is the examination as given by the study plan. The whole German for Advanced Students Course is completed by an examination co		
and oral, which o	over the courses NP1 - NP3. The oral part follows after passing the written part successfully and after obtaining the 04NP3 ungraded information is to be obtained from the teacher.	l assessment. More	detailed
04XRM1	Russian for Intermediate Students M1	Z	2
-	ned for students with previous knowledge of Russian from secondary schools. Students are supposed to know the Russian alphabet (•	
=	or communication in everyday situations (introductions, socializing, greetings, shopping for food and objects of everyday need, asking Sic grammar structures (verbal and nominal forms, irregular verbs, pronouns). The initial knowledge corresponds to the achievement l		
	contents and scope of the course correspond approximately to the RZ3 course, but for half of the time allotted in the timetab	le.	
04XRM2	Russian for Intermediate Students M2	Z	2
04XRM3	The course is based on the RM1 course, its contents and scope correspond roughly to RZ4, however, for half of the time allotted in th Russian for Intermediate Students M3	Z	2
	os the knowledge and skills acquired in RM1 and RM2 and its contents and scope are roughly at the same level as those of RZ5, howe in the timetable.	_	
04XRMZK	Russian for Intermediate Students Examination	ZK	4
	t is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowled	1	- 1
- RM3. Stud	ents are eligible for the oral examination only after a prior pass in RM3 and a successful written examination. Students are given instr	ructions by the teacl	her.
04XRP1	Russian for Advanced Students P1	Z	2
The entrance req	uirement for the course is to achieve the B1 CEFR level. The objective of the course is revision of standard language structures, practice of the course is revision of standard language structures, practice of the course is revision of standard language structures, practice of the course is revision of standard language structures, practice of the course is revision of standard language structures, practice of the course is revision of standard language structures, practice of the course is revision of standard language structures, practice of the course is revision of standard language structures, practice of the course is revision of standard language structures, practice of the course is revision of standard language structures, practice of the course is revision of standard language structures.	ticing more difficult	grammar
0.41//D.D.0	structures, understanding the fundamentals of technical language and training writing skills.	-	
04XRP2	Russian for Advanced Students P2	Z	2
The course is bas	ied on RP1. It expands grammatical structures important for understanding technical texts (verbal adjectives, participles, passives, ve structures). Stress is put on independent oral and written communication.	ib aspects, specific	Symactic
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	g, translation). The F	RP1 - RP3
courses require go	od previous knowledge of general language at secondary level (listening, reading, correct communication in everyday situations). The	courses develop a	nd expand
	er study is aimed at professional and technical skills (reading technical literature according to the students' specialization, oral and wr	•	
develop their subte	chnical vocabulary and practice quick and correct communication in professional situations. They will be able to both speak write accutechnical topics.	urately and with con	itidence on
04XRPZK	Russian for Advanced Students Examination	ZK	4
	It is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowled		red in RP1
- RP3. Stud	ents are eligible for the oral examination only after a prior pass in RP3 and a successful written examination. Students are given instr	uctions by the teach	ner.
04XRZ1	Russian for Beginners Z1	Z	2
-	ents the first stage of the five-semester programme, its final aim being reading and understanding professional texts written in Russian bet (for both reading and writing skills) and fundamentals of grammar necessary for everyday communication (listening and speaking)	-	- 1
the Russian alphai	a short text with marked stress, understand its contents and summarize it.	i. Students will be a	bie to read
04XRZ2	Russian for Beginners Z2	Z	2
	ster of the programme is designed to teach skills for basic communication in everyday situations and for reading easy and short subte		
able to communica	te using short sentences and appropriate structures, and read aloud with confidence a short text without marked stress. They will also	•	bulary 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 d introduces new grammar. Students will be trained to distinguish intonation patterns while listening to spoken language. They will be		- 1
and notoning, an	understood, and to express their opinion. Writing skills will be trained on guided writing tasks and note-taking.	abio to respend se	40 10 20
04XRZ4	Russian for Beginners Z4	Z	2
	d on RZ3. It improves and expands the knowledge of general language in all four skills (reading and understanding longer texts with a c	ertain percentage of	f unfamiliar
	nunication in everyday situations, writing longer texts). Students are trained to use grammar structures effectively (e.g., irregular verbs		
	dality, imperatives, conditionals). They practice and develop communication skills for everyday situations (food, travelling, free time), a n more specific topics (environment, addictions, the green movement). They become acquainted with various geographical data (e.g.	· ·	
communication	forms, look up the information from the timetable, learn about Russian holidays and typical meals.	, Olberia), learn nov	W 10 1111 111
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 su	
	specialized text) and speaking, and to a certain extent, writing about the professional information obtained by reading the texts. Comm		
	Studying grammar is based on professional and technical texts and only includes items typically used in professional communication (articiples,
04XRZZK	ve voice). Students develop their technical and economic vocabulary, and are also trained in some professional skills (writing a CV, po	ZK	3
	Russian for Beginners Examination		_
	it is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowled	lge and skills acquir	ea in Kz i i
- KZ5. Stud	it is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowled ents are eligible for the oral examination only after a prior pass in RZ5 and a successful written examination. Students are given instr	-	
04XSM1		-	
04XSM1 The course is des	ents are eligible for the oral examination only after a prior pass in RZ5 and a successful written examination. Students are given instr Spanish for Intermediate Students M1 signed for students whose competence is at level B1 of CEFR, i.e. those who studied Spanish in the secondary school. The 3-semest	uctions by the teach Z er course develops	ner. 2 standard
04XSM1 The course is des	ents are eligible for the oral examination only after a prior pass in RZ5 and a successful written examination. Students are given instr Spanish for Intermediate Students M1	uctions by the teach Z er course develops	ner. 2 standard

04XSM2	Spanish for Intermediate Students M3 Z	2
The course develops	s the students' knowledge from the previous course (XSM1). Students are gradually acquainted with fundamentals of Spanish for specific purpos able to work with specialized texts on the Internet.	ses in order to b
04XSM3	Spanish for Intermediate Students M3 Z	2
II.	e supplemented with additional subtechnical materials, so the students will be gradually acquainted with the peculiarities of academic style. They	
enough to use the In	sternet in Spanish and search for information of their specialization or field of interest. Students will use the information to write short articles and	summaries. The
	inal part of the programme, general Spanish course based on course books, covers presentations and, finally, a written and oral examination.	
04XSMZK	Spanish for Intermediate Students Examination ZK	4
The course conter	nt is the examination as given by the study plan. XSMZK examination consists of two parts: written and oral; to be eligible for the written part, stu	dents will have
047604	obtained non-graded assessment for course XSM3. Oral examination follows the written part. Spanish for Advanced Students P1 Z	2
04XSP1	son more difficult grammar topics, revision of vocabulary, basics of Spanish for specific purposes as well as written communication. Course prere	1
course concentrates	of CEFR.	squisites, level D
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 and focuse	
	written communication.	
04XSP3	Spanish for Advanced Students P3 Z	2
Course XSP3 is the f	inal part of the advanced Spanish course. It is based on texts chosen by the students according to their future specialization. It is focused on written	n communicatio
	based on what students will need in their career.	
04XSPZK	Spanish for Advanced Students Examination ZK	4
	t is the examination as given by the study plan. Examination XSPZK consists of two parts, namely oral and written. The prerequisite for admissic g passed the written test. Examination content is based on syllabi of courses XSP1, XSP2, and XSP3 or on an individual study plan of the stude	
		2
04XSZ1 Course XSZ1 is the	Spanish for Beginners Z1 Z first stage of the five-semester programme of Spanish studies; during the first stage the students will master phonetics and fundamental gramma	
	communicate at an elementary level on topics of everyday life. They will acquire and extend fundamental vocabulary of general Spanish and will	
04XSZ2	Spanish for Beginners Students Z2 Z	2
	sed on course XSZ1, and expects students to develop and extend the knowledge and skills acquired so far. Grammar structures and lexis will be	
enable them to und	erstand short adapted written texts and speech. Attention is also paid to cultural differences between Spanish-speaking countries and others sur	ch as the Czech
	Republic. Realia of Spanish-speaking countries are also included.	
04XSZ3	Spanish for Beginners Z3 Z	2
	ipon the foundations established in course XSZ2 and further develops students vocabulary and grammatical competence. It includes an introduc	
	of Spanish-speaking countries, with a primary focus on Spain. Particular attention is given to key grammatical structures, including the pretérito primperfecto, the gerund, and the imperative. The course also focuses on both written and spoken communication on general topics. Students are	
indennido, pretento i	through targeted reading and listening activities.	prepared for this
04XSZ4	Spanish for Beginners Z4 Z	2
	on course XSZ3. It develops the student's vocabulary and extends the knowledge of the culture and social customs of the Spanish speaking co	
Spain. It pays attent	ion to further grammar topics (perífrasis verbales, futuro imperfecto, direct object and indirect object pronouns, negative form of the imperative, a	and subjunctive)
to	written and oral communication on a given general or subtechnical topic, for which the student is trained by reading texts or listening to them.	
04XSZ5	Spanish for Beginners Z5 Z	2
The course books a	re supplemented with additional subtechnical materials, so the students will be gradually acquainted with peculiarities of Spanish for specific pur	poses. In its fina
041/0771/	part, the general Spanish course based on the course book will end with a written and oral examination.	
04XSZZK	Spanish for Beginners Examination ZK sthe examination as given by the study plan. Examination consists of two parts: written and oral. Students can register for oral examination only if	boy have passe
The course content is	the written examination test.	illey llave passe
12ANM	Applied Numerical Methods KZ	4
	ise code 12YNME1. The basic principles of numerical mathematics important for the numerical solution of physical and technical problems are exp	1 -
=	nerical tasks, problems relevant to physicists are also included (e.g. solving ordinary differential equations). The exercises take place in a comput	
	demonstrations of various numerical methods, their properties, and applications.	
14TED	Creating Electronic Documents Z	2
Basic skills for creating	ng and presenting student theses. Individual exercises focus on creating and formatting texts, equations, charts, tables, presentations and entire	documents in a
	office suite.	
15CH1	General Chemistry 1 Z	3
i ne most important d	concepts, quantities and units used in chemistry are introduced in the course General Chemistry I. Their significance and practical use are illustrated in exercises.	ated by example
15CH2	General Chemistry 2 Z,ZK	3
	ortinuation of the course General chemistry I. The main attention is paid to general principles governing chemical processes. Using various exam	
=	principles is not restricted only to chemical processes is documented. The significance and practical use of explained principles are illustrated by	-
	in exercises.	
16UJRF1	Introductory Nuclear and Radiation Physics 1 Z,ZK	4
The aim of the cours	Introductory Nuclear and Radiation Physics 1 Z,ZK e is to provide students with basic knowledge about atomic nucleus and radiation physics, which is followed by other specialized lectures. The sul	oject summarize
The aim of the course thematic areas: deve	Introductory Nuclear and Radiation Physics 1 Z,ZK e is to provide students with basic knowledge about atomic nucleus and radiation physics, which is followed by other specialized lectures. The sul elopment of opinions on micro-wave and radiation physics, basic characteristics of the atom and nucleus, binding energy, measurement of mass	bject summarize and dimensions
The aim of the course thematic areas: deve	Introductory Nuclear and Radiation Physics 1 e is to provide students with basic knowledge about atomic nucleus and radiation physics, which is followed by other specialized lectures. The sul elopment of opinions on micro-wave and radiation physics, basic characteristics of the atom and nucleus, binding energy, measurement of mass st important nuclear models. General characteristics of the interaction of ionizing radiation with the matter, interaction of alpha, beta, gamma and the support of the interaction of ionizing radiation with the matter, interaction of alpha, beta, gamma and the support of the interaction of ionizing radiation with the matter, interaction of alpha, beta, gamma and the support of the interaction of ionizing radiation with the matter, interaction of alpha, beta, gamma and the support of the interaction of ionizing radiation with the matter, interaction of alpha, beta, gamma and the support of the ionizing radiation with the matter, interaction of alpha, beta, gamma and the support of the ionizing radiation with the matter, interaction of alpha, beta, gamma and the support of the ionizing radiation with the matter, interaction of alpha, beta, gamma and the support of the ionizing radiation with the matter, interaction of alpha, beta, gamma and the support of the ionizing radiation with the matter, interaction of alpha, beta, gamma and the support of the ionizing radiation with the matter, interaction of alpha, beta, gamma and the support of the ionizing radiation with the matter, interaction of alpha, beta, gamma and the support of the ionizing radiation with the matter, interaction of alpha, beta, gamma and the support of the ionizing radiation with the support of the ionizing radiation with the matter of the support of the ionizing radiation with the matter of the ionizing radiation with the support of the ionizing ra	bject summarize and dimensions
The aim of the course thematic areas: deve of the nuclei, the mos	Introductory Nuclear and Radiation Physics 1 Z,ZK e is to provide students with basic knowledge about atomic nucleus and radiation physics, which is followed by other specialized lectures. The sul elopment of opinions on micro-wave and radiation physics, basic characteristics of the atom and nucleus, binding energy, measurement of mass st important nuclear models. General characteristics of the interaction of ionizing radiation with the matter, interaction of alpha, beta, gamma and passage of radiation beams through the matter, radiation effects in matter.	bject summarize and dimensions neutron radiation
The aim of the cours thematic areas: develor the nuclei, the mos	Introductory Nuclear and Radiation Physics 1 z,ZK e is to provide students with basic knowledge about atomic nucleus and radiation physics, which is followed by other specialized lectures. The sul elopment of opinions on micro-wave and radiation physics, basic characteristics of the atom and nucleus, binding energy, measurement of mass st important nuclear models. General characteristics of the interaction of ionizing radiation with the matter, interaction of alpha, beta, gamma and passage of radiation beams through the matter, radiation effects in matter. Fundamentals of Radiation Dosimetry 1 Z,ZK	oject summarize and dimensions neutron radiation
The aim of the cours thematic areas: develor the nuclei, the mos	Introductory Nuclear and Radiation Physics 1 e is to provide students with basic knowledge about atomic nucleus and radiation physics, which is followed by other specialized lectures. The sul elopment of opinions on micro-wave and radiation physics, basic characteristics of the atom and nucleus, binding energy, measurement of mass st important nuclear models. General characteristics of the interaction of ionizing radiation with the matter, interaction of alpha, beta, gamma and passage of radiation beams through the matter, radiation effects in matter. Fundamentals of Radiation Dosimetry 1 Z,ZK nent, and objectives of dosimetry. Quantities and units used for description of sources, fields, interactions of ionizing radiation, ionizations, energy	oject summarize and dimensions neutron radiation
The aim of the cours thematic areas: develof the nuclei, the most 16ZDOZ1 History, developm	Introductory Nuclear and Radiation Physics 1 z,ZK e is to provide students with basic knowledge about atomic nucleus and radiation physics, which is followed by other specialized lectures. The sul elopment of opinions on micro-wave and radiation physics, basic characteristics of the atom and nucleus, binding energy, measurement of mass st important nuclear models. General characteristics of the interaction of ionizing radiation with the matter, interaction of alpha, beta, gamma and passage of radiation beams through the matter, radiation effects in matter. Fundamentals of Radiation Dosimetry 1 z,ZK nent, and objectives of dosimetry. Quantities and units used for description of sources, fields, interactions of ionizing radiation, ionizations, energy absorption. Fundamentals of the effects of ionizing radiation.	oject summarize and dimensions neutron radiation 4 y transfer and
The aim of the cours thematic areas: develof the nuclei, the most 16ZDOZ1 History, developm	Introductory Nuclear and Radiation Physics 1 e is to provide students with basic knowledge about atomic nucleus and radiation physics, which is followed by other specialized lectures. The sul elopment of opinions on micro-wave and radiation physics, basic characteristics of the atom and nucleus, binding energy, measurement of mass st important nuclear models. General characteristics of the interaction of ionizing radiation with the matter, interaction of alpha, beta, gamma and passage of radiation beams through the matter, radiation effects in matter. Fundamentals of Radiation Dosimetry 1 Z,ZK nent, and objectives of dosimetry. Quantities and units used for description of sources, fields, interactions of ionizing radiation, ionizations, energy	oject summarize and dimensions neutron radiation 4 y transfer and

17BPJI1	Bachelor Thesis 1	Z	5
Student on the bas	sis of theses assignment and under leading of a supervisor individually processes given topic during 2 semesters. The subject is give topic. The work is continuously check by a supervisor.	n by self-reliant wo	rk on given
17BPJI2	Bachelor Thesis 2	Z	10
	Dacheror Thesis 2 sis of theses assignment and under leading of a supervisor individually processes given topic during 2 semesters. The subject is give	I	_
Ottacin on the bac	topic. The work is continuously check by a supervisor.	ir by 3011 reliant we	in on given
17BPROV	Safe operation of nuclear facilities	KZ	2
	The aim of the subject is to familiarize students with basic principles of nuclear safety.		_
17DEZA	Detection of Ionizing Radiation	KZ	3
	es basic information about sources and methods of detection of ionizing radiation and spectroscopy, with special emphasis on neutro	n detection and sp	ectrometry.
The subject focus	es on the physical principles of detection, but introduces detection technology to the extent appropriate. An important part is a labora	tory practice, when	e students
inc	dividually solve seven tasks in groups of up to three students. It also includes writing a measurement report, which teaches to write s	cientific work.	
17ENEF	Experimental Neutron Physics	KZ	3
	sed on experimental methods and experiments in the field of neutron physics, mainly using radionuclide neutron sources. The lectures		
-	or preparation and realization of the laboratory exercises and to the methods of experimental data processing and evaluation. Specifical	-	
	ron properties and their utilization, the characteristics of neutron sources, properties of prompt and delayed neutrons, selected method		
-	nces, production, formation and modification of neutron fields and neutron beams. The lectures are complemented by the laboratory e urement of delayed neutrons, study of neutron transport in various substances, experiments with various neutron sources (252Cf, Am		
	I detection of photo-neutron source, calibration of the radionuclide neutron source. The experiments are realized at the VR-1 training i		**
17ENER		ZK	2
	Energy es students with basic information about energy industry as a branch of economy. It has five co-related parts: World energy, including l	I	
•	es, transport and consumption. Energy industry of the Czech Republic, including history with an emphasis on recent development, incl	• •	
_	nal basis, a description of the main Czech energy industry components and the State Energy Strategy. Energy industry in the EU; the	• .	
_	gration, including important processes, documents and legal instruments. Institutions of energy systems describing the basic models	· ·	
	d specifically in the EU and the Czech Republic. Attention is also paid to energy modelling. Technical ground of energy production/transf		-
generation covering	g a basic technical description of fossil, nuclear, water, wind and solar power plants, including a discussion of their advantages and disc	advantages and en	vironmental
impact, including	phenomena such as greenhouse effect and climate change. Attention is also paid to energy networks. The conclusion of the course is	s devoted to discus	sing of the
	main topics of current energy industry and student presentations on the chosen topic.		
17EXE	Excursion	Z	2
	ubject is to familiarize students with institutions and industry connected with the nuclear energy production in the Czech Republic. Th		
	possibilities of the participating companies, but it always covers basic fields: (i) research, development and engineering (e.g. ÚJV a.s		
SKODA JS a.s.),	(ii) fuel cycle (e.g. UJP PRAHA a.s., SÚRAO, EZ a.s.), (iii) electricity and heat production (EZ a.s.), (iv) radiation protection and or	versight (SUJB, SU	JRO). The
	subject requires 5 full days, which are uniformly spread among semester and examination period.	_	
17IJR	Instrumentation of Nuclear Reactors	Z	3
	entrated on the instrumentation of nuclear reactors. The introduction is devoted to requirements on the safe operation of nuclear powers to systems with a respect to the nuclear safety according to IAEA, IEC and IEEE standards. Next, the attention is oriented to sensors of	-	
	se, DC current and Campbell operation, thermocouples, thermoresistors, pressure and flow meters. Next part is directed to the incore		
detectors, trien pair			mentation of
nuclear power pla			
	ants Dukovany and Temelin, to the evaluation of their states and power measurement. Next are presented safety functions of nuclear	power plants, their	actication
and systems that		power plants, their ples of foreign nuc	actication lear power
and systems that	ants Dukovany and Temelin, to the evaluation of their states and power measurement. Next are presented safety functions of nuclear carries out safety actions. Attention is also given to the qualification of nuclear power plants systems. There are also presented exam	power plants, their ples of foreign nuc	actication lear power
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in homogeneous multiplying and non-multiplying media. The same theory is also utilized for large-scale calculations of nuclear reactor cores. Conclusions obtained for homogeneous reactor are subsequently compared to heterogeneous reactors. Lecture on fundamentals of nuclear rector kinetics and dynamics is also included. 17STJE Heat Transfer in Nuclear Power Plants 7 7K The course titled Heat Transfer in Nuclear Power Plants presents to the students the fundamental principles of heat transfer with a focus on nuclear power-related applications. Most of the terms and laws were introduced in the course 02TER which is a predecessor of this course. The course 17STJE elaborates the principles in details and extends the knowledge of students mainly in the areas related to the heat transfer in nuclear cores. An overview lecture of the basic principles will be given at the beginning of the course and all of the fundamental heat transfer mechanism will be discussed during the next weeks. It will start with conduction followed by convection and radiation at the end. The course focuses on the applications of thermokinetics related to nuclear reactors and equipment related to nuclear power plants and spent nuclear fuel. For that reason, conduction and convection are to be discussed into details. Convection is divided according the nature of the flow into laminar and turbulent. The concept of radiative heat transfer was theoretically introduced in previous courses and the applications and models used by industry will be presented here. The course includes also fundamentals of heat transfer with phase changes main emphasis is given to boiling. 17TEMT Thermodynamics and fluid mechanics of nuclear power plants Z,ZK The course gives summary of basic knowledge of the two theoretical fields which are important for the nuclear reactors and nuclear power plants design and operation: thermodynamics engineering and fluid mechanics. Both fields are lectured with hand-on approach, so that students obtain elementary view on issue, they will be able to calculate basic and simplified tasks and they will be able to study this issues in more details in next continuing special courses. 17TEXT ΚZ Writing and presenting academic text 2 The course focuses on examples development of soft skills how to write and present academic text. The first part of the course is dedicated to introducing and classifying various academic texts, essential rules for writing an academic text, and creating an appropriate structure of the written text. Follows lectures related to basic typographic rules for graphical arrangement of a written text; rules how to write and create tables, graphs, figures; differences between new text and plagiarism; and how to manage references and citations in academic texts in nuclear engineering. In this part, students are familiarised with widely used software for the writing of the academic text. The first part of the course is dedicated to presenting academic text, mainly to introduction to verbal and non-verbal aspects of presentation; to all stages of presentation building; and widely used software for presenting academic text. Exercises that follow theoretical lectures give a chance to students to apply theory into practice with the primary aim to give the first experiences to students before they start writing and presenting their bachelor thesis. 17UING Introduction to Engineering ΚZ This course provides introduction to engineering skills. Students should gain general engineering skills at basic level (e.g. material properties and behavior, basics of manufacturing and production, quality assurance, environmental impacts,). In addition, the introduction to scientific work and technical drawing will be included. 177FL **Basics of Electronics** Lectures provide basic information of electronics. In the beginning, lectures are devoted to passive components - resistors, capacitors, inductors and solution of electrical circuits with them. Next, lectures deal with semiconductor components (standard, Zener, capacitive, LED), bipolar, unipolar transistors and semiconductor components 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. Programming in MATLAB Introducing Matlab environment as efficient tool for computation in complex arrays and symbolic variables, namely for linear algebra, mathematic analysis, statistics, algorithmization and geometric representation of results. 18PRC1 Programming in C++ 1 Ζ 4 This course covers mainly the C programming language and non-object oriented features of the C++ language. 18PRC2 Programming in C++ 2 ΚZ 4 This course covers the object oriented programming and othesr advanced constructs in the C+;+ programming language and the Standard Template Library 18ZALG Basics of Algorithmization 7.7K 4 This course is devoted to selected algorithms and methods for algorithm design. This course intruduces selected methods for the determination of the algorithm complexity. 18ZPRO Basics of Programming Z 4 This course is intended mainly for students with little or no experience in programming. It familiarizes the students with the basic concepts in programming and with the Python programming language. TV-1 Physical Education Ζ 1 TV-2 Physical Education 7 1

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Physical education

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For updated information see http://bilakniha.cvut.cz/en/FF.html Generated: day 2025-11-28, time 09:12.

TV-3

TV-4