## Study plan

# Name of study plan: Jaderná chemie

Faculty/Institute/Others:
Department:
Branch of study guaranteed by the department: Welcome page
Garantor of the study branch:
Program of study: Nuclear Chemistry
Type of study: Bachelor full-time
Required credits: 0
Elective courses credits: 180
Sum of credits in the plan: 180
Note on the plan:

Name of the block: Compulsory courses in the program Minimal number of credits of the block: 0 The role of the block: P

Code of the group: BSPJCH1 Name of the group: BS P\_JCHB 1st year

Requirement credits in the group:

Requirement courses in the group: In this group you have to complete at least 15 courses

Credits in the group: 0

Note on the group: Vykonání zkoušky 15ANCH1 je podmíněno úspěšným absolvováním předmětů 15LABT.Vykonání zkoušky 15ANCH2 je podmíněno úspěšným absolvováním předmětů 15ANCH1 a 15ANP.Vstup do praktika je podmíněn úspěšným absolvováním předmětu 15LABT.

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
15ANCH1	Michaela Fridrichová, Václav Tyrpekl, Jan Kotek Václav Tyrpekl Jan Kotek (Gar.)	Z,ZK	5	3+2	Z	Ρ
15ANCH2	Inorganic Chemistry 2 Michaela Fridrichová, Václav Tyrpekl, Jan Kotek, Petr Št pni ka Václav Tyrpekl Jan Kotek (Gar.)	Z,ZK	5	3+2	L	Ρ
15ANP	Practical Training in Inorganic Chemistry Václav Tyrpekl, Vojt ch Kubí ek Václav Tyrpekl Václav Tyrpekl (Gar.)	Z	4	9 dní	L	Ρ
02ELMA	Electricity and Magnetism Iskender Yalcinkaya, Josef Schmidt, Ji í Hrivnák, Goce Chadzitaskos, Jan Vysoký Jan Vysoký Josef Schmidt (Gar.)	Z,ZK	6	4+2	L	Ρ
15LABT	<b>Practical Training in Laboratory Technique</b> Michaela Fridrichová, Michaela Fridrichová <b>Michaela Fridrichová</b> Michaela Fridrichová (Gar.)	Z	3	0+4	Z	Ρ
01MATZ1	Mathematics, Examination 1 Radek Fu ik Radek Fu ik Radek Fu ik (Gar.)	ZK	2	-	Z	Ρ
01MATZ2	Mathematics, Examination 2 Radek Fu ík, Mat j Tušek Mat j Tušek Radek Fu ík (Gar.)	ZK	2	-	L	Ρ
01MAT1	Mathematics 1 Radek Fu ik Radek Fu ik Radek Fu ik (Gar.)	Z	4	3P+3C	Z	Ρ
01MAT2	Mathematics 2 Radek Fu ik Radek Fu ik Radek Fu ik (Gar.)	Z	4	3P+3C	L	Ρ
02MECH	Mechanics David B e Antonín Hoskovec David B e (Gar.)	Z	4	4+2	Z	Ρ
02MECHZ	<b>Mechanics - Examination</b> Iskender Yalcinkaya, Goce Chadzitaskos, Stanislav Skoupý, Petr Novotný, David B e , Filip Petrásek, Antonín Hoskovec <b>Antonín Hoskovec</b> David B e (Gar.)	ZK	2	-	Z	Ρ
15OCH	General Chemistry Petr Distler, Ond ej Holas Petr Distler Petr Distler (Gar.)	Z,ZK	6	5+2	Z	Ρ
15ORCA1	Organic chemistry 1 Michal Sakmár, Ján Kozempel, Stanislav Smr ek, Martin Vlk Stanislav Smr ek Ján Kozempel (Gar.)	Z	2	2P+2C	L	Ρ
00PT	Preparatory Week Petr Ambrož, Milan Krbálek Petr Ambrož Petr Ambrož (Gar.)	Z	2	týden	Z	Ρ

15TOXA	Toxicology Ján Kozempel, Martin VIk Martin VIk Ján Kozempel (Gar.)	ZK	2	2P	L	Р
Characteristics	of the courses of this group of Study Plan: Code=BSPJCH1 Name=BS	S P_JCHB	1st year			
15ANCH1					Z,ZK	5
15ANCH2	Inorganic Chemistry 2				Z,ZK	5
	rse is devoted to systematical chemistry of elements. The properties of representative elements,	transition elem	ents and che			compounds are
characterised. Selec	ted chapters in the second part of course deal with catalysis, organometallic compounds and cher	nistry of solid s	state. The role	e of metal io	ns in biolog	ical environmen
is discussed at the e	end of course.					
15ANP	Practical Training in Inorganic Chemistry				Ζ	4
Basic practical cours	se dealing with synthesis and characterization of inorganic compounds. Students get practical tra	ining in synthe	eses of inorg	anic compo	unds by ac	id- base and
oxidation-reduction r	reactions, complex formation reactions and reactions in melt.					
02ELMA	Electricity and Magnetism				Z,ZK	6
Electric charge, Cou	lomb's law, electrostatic field, Gauss' law. Electric dipole, polarization. Conductors and dielectric	s. Electric curre	ent and circu			s of the relativity
theory. Electrodynam	nic forces, magnetic field. Magnetic dipole, magnetics. Electromagnetic induction, RLC circuits. E	lectromagnetic	c waves, Ma	xwell equati	ons.	
15LABT	Practical Training in Laboratory Technique				Ζ	3
This course covers b	basic laboratory training and is designed for students of "Chemistry in Science", "Teaching of Che	mistry", and "I	Biology". The	course put	s the labora	atory experience
of the students gaine	ed at secondary school to an equal level and gets them ready for all following laboratory trainings	s. After absolvi	ng of the cou	urse, the stu	idents have	e the basic skills
including handling th	ne most frequently used laboratory equipments (pH-meter, UV-Vis spectrophotometer, vacuum ro	tary evaporato	or) and have	the necessa	ary information	tion about safety
rules as well as abou	ut writing laboratory diaries. The training is organized in blocks of four hours a week. The student	s work in grou	ps of two ac	cording to a	firm sched	lule so that each
group absolve the co	omplete set of (all) 10 exercises during semester. In the exercises, measurements of properties of	of unknown sai	mples, basic	synthetic a	nd purificat	ion operations
and basic methods of	of analyses are involved.					
01MATZ1	Mathematics, Examination 1				ZK	2
01MATZ2	Mathematics, Examination 2				ZK	2
01MAT1	Mathematics 1				Ζ	4
The course is devote	ed to the study of the basics of calculus of one variable. It includes an introduction to differential a	and integral ca	lculus, with p	oarticular en	nphasis on	applications in
practical problems.						
01MAT2	Mathematics 2				Ζ	4
The course, which is	s the continuation of Mathematics 1, is devoted to the integration techniques, improper Riemann	integral, introd	luction to par	ametric cur	ves (espec	ially in polar
coordinates), the bas	sics of sequences and infinite series, and finally to the Taylor and power series and their applicat	ions.				
02MECH	Mechanics				Ζ	4
Introduction to physic	ics, physical quantities and units. Kinematics of a particle, basic types of motion and their superp	osition. Dynam	nics of a part	icle, solving	equations	of motion for
	ption, motion in a central force field, forces in non-inertial reference frames. Mechanics of a system	m of particles,	two-body pre	oblems, par	ticle collisio	ons. Mechanics
of a rigid body, rotati	ion.					
02MECHZ	Mechanics - Examination				ZK	2
The content of the su	ubject is the examination according to the plan of studies.					-
15OCH	General Chemistry				Z,ZK	6
General chemistry, c	classification of substances, concentrations, chemical reactions and equations, stoichiometric cal	culations, ator	ms and mole	cules, chem	nical bond,	the states of
matter, chemical ther	rmodynamics, first law of thermodynamics, thermochemistry, second law of thermodynamics, entre	opy, Gibbs ene	rgy, phase ar	nd chemical	equilibria, e	electrochemistry
pH, reaction kinetics	s, kinetic equation, Arrhenius' equation.					
15ORCA1	Organic chemistry 1				Z	2
Structure of organic	compounds, properties of covalent bond, reactions on covalent bonds. Nomenclature of organic	compounds (r	main chain, g	roup, locan	ts, prefixes	and suffixes) .
Spatial structures of	organic compounds, double bond isomers, chirality, enantiomers and diastereomeric compounds	s. Configuratio	n and confor	mation, rela	itionships. L	_ewis structures,
formal charges, acid	lity, hard and soft acids and bases. Resonance, aromaticity, classification of substituents, reactivi	ty of polycyclic	c arenes. Inte	ermediates:	carbocatio	ns, carbanions,
	electronic structure. Basic overview on alkanes and cycloalkanes, alkenes, arenes, halogenderiv	atives, organo	ometallic con	npounds, alo	cohols and	ethers, organic
compounds of sulfur	r, nitrogen, phosphorus, silicon, other elements and carbonyl compounds chemistry.					
00PT	Preparatory Week				Z	2
15TOXA	Toxicology				ZK	2
Overview of basic to:	xicology, containing general and special toxicology, toxicological data, legislation and basic aspec	ts of chemical	compounds	handling. In	general to	xicology aspects
of toxicity, metabolisi	m, biodistribution and elimination has been described, as well as toxicological effects, evaluation	of toxicity, ind	exes, and bi	ological test	s. In specia	al toxicology part
selected aroup of or	ganic compounds, inorganic compounds, natural compounds and warfare were described from t	ovicity behavic	ur In leaisla	tion nart RE	ACH intor	national and

### Code of the group: BSPJCH2

Name of the group: BS P\_JCHB 2nd year

Requirement credits in the group:

Requirement courses in the group: In this group you have to complete at least 13 courses Credits in the group: 0

Note on the group:

national regulation is described.

y: Vykonání zkoušky 15ORCA2 je podmíněno splněním povinností z předmětu 15ORCA1.Vykonání zkoušky15ANALY2 je podmíněno splněním povinností z předmětů 15ANAL1, 15APLA.Zápis předmětu 15POCHA je podmíněn absolvováním předmětu 15ORCA2.

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
15ANAL1	Analytical Chemistry 1 Vlastimil Vysko il, Anna Kubí ková Vlastimil Vysko il Vlastimil Vysko il (Gar.)	Z	5	3+2	L	Р
15ANALY2	Analytical Chemistry 2 Vlastimil Vysko il Vlastimil Vysko il (Gar.)	Z,ZK	5	3P+2C	L	Ρ

Construction         Units         Display         Display <thdisplay< th=""></thdisplay<>		1			1		ſ
Construct         Learning         Display         Learning         Display         Learning         Display           15JACH1         Muclear         CXX         3         2411         L         P           15JACH1         Muclear         Keyne Marking Markin	15FCHN1	Physical Chemistry 1 Viliam Mú ka, Jan Bárta Jan Bárta Viliam Mú ka (Gar.)	Z,ZK	5	3+2	Z	Р
ISACH1       Vector       More allow allow (day)       ZZK       3       2+1       L       P         171ARE       Nuclear Reactors       ZXK       2       2       L       P         171ARE       Nuclear Reactors       ZXK       2       2       L       P         171ARE       Nuclear Reactors       ZXK       4       2+2       L       P         171ARE       Nuclear Reactors       ZXK       6       2P+2C       Z       P         175CRCA2       Organic Chemistry Practical       XAM: Hrain (Six+)       Z       4       4L       L       P         175POCHA       Organic Chemistry Practical       XAM: Hrain (Six+)       Z       Z       4       4L       L       P         176POCH       Throngene Chemistry Practical       XAM: Hrain (Six+)       Z       Z       2       P       C       Z       P         176FOLE       Thep	15FCHN2		Z,ZK	5	3+2	Z	Р
Transfer         Tomais Bity Tomais Bity (Ger)         Link         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L <thl< th="">         L</thl<>	15JACH1	Václav uba, Merja Johanna Herzig, Xenie Lytvynenko, Jan John Václav	Z,ZK	3	2+1	L	Р
MIART3         Intercaser robel, Danie Kreg / Ik. Seven Peter David Kreg / Ik. Zick         4         2+2         Z         P           MIART4         Mathematics 4         Inter / Tubek (Sar)         Z.ZK         4         2+2         Z         P           MIART4         Mathematics 4         Inter / Tubek (Sar)         Z.ZK         4         2+2         L         P           ISAPLA         Laboratory Training in Analytical Chemistry 2         Z         4         4L         L         P           ISAPLA         Laboratory Training in Analytical Chemistry 2         Z         4         4L         L         P           ISAPLA         Laboratory Training in Analytical Chemistry 2         Z         4         4L         L         P           ISPOLE         Theory of Electromagnetic Field and Waves         Z.ZK         4         4+11         L         P           ISPOLE         Theory of Electromagnetic Field and Waves         Z.ZK         4         4-11         L         P           ISPOLE         Theory of Electromagnetic Field and Waves         Z.ZK         5         5           ISPOLE         Theory of Electromagnetic Field and Waves         Z.ZK         5         5           ISPOLE         Theory of Electromagnetic Field a	17JARE		ZK	2	2	L	Р
Intervent         Mark Ji Tuber Mar Ji	01MAT3	Mathematics 3 Miroslav Kolá , David Krej i ík, Severin Pošta David Krej i ík David Krej i ík	Z,ZK	4	2+2	Z	Р
150RCA2       Indexia Sawark, see Academyee, Sawarkee Xam et Marin Vin Stanister Smr et ZZK       6       2P+2C       Z       P         153RPLA       Laboratory Training in Analytical Chemistry       Z       4       4L       L       P         153RPLA       Datoratory Training in Analytical Chemistry       Z       4       4L       L       P         155POCHA       Organic Chemistry Practical Meedia Locare Mindske Uncerne Linksky Locare (Gar.)       Z       4       4L       L       P         155POLE       Theory of Electromagnetic Field and Waves       Z,ZK       4       4L1       L       P         155RDLA       Fundamentals of Biochemistry       Tomids Jermer, Radek Indra Radek Indra Tomids Jermer (Gar.)       ZK       2       2P+0C       Z       P         152RDHA       Fundamentals of this group of Study Plan: Code=BSPJCH2 Name=BS P_JCHB 2nd year       5       5         153NA11       Analytical Chemistry 1       analytical Chemistry 1       Z       5         150NAL0, namer, Radek Indra Radek Indra Tomids Jermen (Gar.)       Z/XK       5       5         151NA1       Analytical Chemistry 1       Z/XK       5       5         152NA1       Analytical Chemistry 2       Z/XK       5       5         153NA1       Analytical	01MAT4		Z,ZK	4	2+2	L	Р
Construct         Lear bit Martine Struktub Transi ek Jakub Transi ek Garu)         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L<	15ORCA2	Michal Sakmár, Ján Kozempel, Stanislav Smr ek, Martin Vlk Stanislav Smr ek	Z,ZK	6	2P+2C	Z	Р
ISPOCHA       Organic Chemistry Practical Minasiv Lorence Minosite Lorence Minosite Lorence Minosite Lorence (Gar.)       Z       4       4L       L       P         15POLE       Theory of Electromagnetic Field and Waves Adves Weekin Adves Veeskin Kales Veeskin Kales Veeskin Kales       Z,ZK       4       4+1       L       P         15ZBCHA       Fundamentals of Biochemistry Tomas and mone, Radek India Tomais Je men (Gar.)       ZK       2       2P+0C       Z       P         characteristics of the courses of this group of Study Plan: Code=BSJCH2 Name=BS P_JCHB 2nd year       I       5         15ANAL1       Analytical Chemistry 1       Advest Meeting and Prespiration reactions, sublify conduct, tectors influencing subbity complexes, thetarome it interacts, sterein or unve, endpoint indecision. Complex formation reactions and complex-formation reactions, sublify conduct, tectors influencing analytical chemistry Scheme and complex-formation reactions, advest particip and participation in transmuscular subvects.       5         15ANAL2       Analytical Chemistry 1       Analytical Chemistry 2       5         15FCHN1       Physical Chemistry 2       Analytical Chemistry 2       5         15FCHN2       Physical Chemistry 2       S       3         16FCHN1       Physical Chemistry 2       S       3         15FCHN2       Physical Chemistry 2       S       3       3         16FCHN1	15APLA	Laboratory Training in Analytical Chemistry	Z	4	4L	L	Р
ISPOLE         Theory of Electromagnetic Field and Waves         Z,ZK         4         4+1         L         P           152BCHA         Fundamentals of Biochemistry Tom8's & men, Ravie, Index Index Rade Index Tom8's & men (Gar.)         ZK         2         2P+0C         Z         P           152BCHA         Fundamentals of Biochemistry Tom8's & men, Ravie, Index Index Rade Index Tom8's & men, Ravie, Index Index Index Rade Index Tous         ZK         2         2P+0C         Z         P           153NAL1         Analytical Chemistry 1         Z         5         5         5           154NAL1         Analytical Chemistry 4         Z         5         5           154NAL1         Analytical Chemistry 4         Z         5         5           154NAL2         Analytical Chemistry 4         Z         K         5           154NAL2         Analytical Chemistry 1         Z         K         5           154NAL2         Analytical Chemistry 1         Z         K         5           156CHNP         Physical Chemistry 2         S         5           167CHNP         Physical Chemistry 2         C         Z         K         5           167CHNP         Physical Chemistry 2         C         Z         K         5 <td>15POCHA</td> <td>Organic Chemistry Practical</td> <td>Z</td> <td>4</td> <td>4L</td> <td>L</td> <td>Р</td>	15POCHA	Organic Chemistry Practical	Z	4	4L	L	Р
Instruction       Fundamentalis of Biochemistry       ZK       2       2 P+0C       Z       P         Instruction       Analytical Chemistry       Image: Second	15POLE	Theory of Electromagnetic Field and Waves	Z,ZK	4	4+1	L	Р
haracteristics of the courses of this group of Study Plan: Code=BSPJCH2 Name=BS P_JCHB And year     [5ANAL1 Analytical Chemistry 1     for Analytical Chemistry 2     for Analytical Chemistry 1     for Analytical Chemistry 2     for Analytical Chemistry 1     for Analytical Chemistry 2     for Analytical Chemistry 4     for Analytical	15ZBCHA	Fundamentals of Biochemistry	ZK	2	2P+0C	Z	Р
ISANAL1       Analytical Chemistry 1       I       5         Includucion, entrofixed of analytical chemistry scheme of analytical procedures. Sampling and proparation of Hampia. Precipitation reactions, stability constant, factors influencing tability of complexes. Chelatometric tratations, titrations, tratations, tratation, tratations, tratations, tratations, tratations, tratations, tratations, tratations, tratation, tratations, tratation, tr	Characteristics of the			nd vear	1	1	
Nandytick chemie 2 navezuje na p edm t Analytická chemie 1. Kurz je zam en na instrumentální metody analytické chemie a zpracováni výsledk analyzy.         Z,ZK         5           15FCHN         Physical Chemistry 1         Z,ZK         5           The introductive part is deviced to the recapitulation of the thermodynamic systems and thermodynamic, phase and chemical equilibrium termodynamics.         Z,ZK         5           Intermedynamics.         Z,ZK         5           Isopecultative of thermodynamics.         Z,ZK         5           Isopecultation on thermodynamics.         Z,ZK         3           Caccure of Physical Chemistry 2         Z,ZK         5           Isopecultation on nuclear nearcons.         Z,ZK         3           Caccure of Physical Chemistry 3         Z,ZK         4           Isopecultation on nuclear nearcons.         Isopecultation on nuclear neactions.           Isopecultat	stability of complexes. Chela for separation and identification	tometric titrations, titration curve, endpoint indication. Qualitative analysis of cations and tion of ions. Acid-base reactions, acids, basis, acidity function, salts, hydrolysis of salts,	anions, applicatio	on of precip	itation and co	omplex-form	nation reactions
15FCHN1       Physical Chemistry 1       Z,ZK       5         The introductive part is devoted to the recapitulation of the thermodynamic systems and thermodynamics, phase and chemical equilibriums are devoted to the first, second third word thermodynamics. Last but not least, attention is devoted also to the thermodynamic, phase and chemical equilibriums are devoted to the first, second and thair applications. Last but not least, attention is devoted also to the thermodynamic, phase and chemical equilibriums are devoted to the first, second and thair applications. Last but not least, attention is devoted also to the thermodynamic, phase and chemical equilibriums are devoted by the elemental of nonequilibrium thermodynamics.       Z,ZK       5         Description of the thermodynamics and their applications. Last but not least, attention is devoted also to the thermodynamics, phase and chemistry a tocuses on thermodynamics of solutions, particularly on electolytes. Basics of colloidal chemistry extend the theory of solvents in the end of the lecture of Physical Chemistry 1       Z,ZK       5         15JACH1       Nuclear Chemistry at adiochemistry inclear on electolytes. Basics of colloidal chemistry extend the theory of solvents in the end of the lecture devices of nuclear reactions, mass and energy balance of nuclear reactions, natural and artificial radioactivity. Kinetics of nuclear reactions, ass and energy balance of nuclear onext. Nuclear fassion reactors, level assemblies, active core, control systems, safety systems, containment. Classification of proposed systems. Sonthair metal. Classification of records in kite Westinghouse, KWU, Fransuton, VVER+ yee actors. The end head and their devicative, head and their devices. Heav yee the reactors. Heav yee there etactors. Revite westereactors. Revite westereactors. Revite westere					Z	,ZK	5
The introductive part is devoted to the recapitulation of the thermodynamic systems and thermodynamic properties of ideal and real gases. Next chapters are devoted to the first, second in the intermodynamics and their applications. Last but not least, attention is devoted also to the thermodynamic, phase and chemical equilibriums as well as to the elemental informedultibrium thermodynamics.           ISECHN2         Physical Chemistry 2         Z,ZK         5           .excure of Physical Chemistry and radiochemistry, nuclear entities, nuclear reactions, natural and artificial radioactivity. Kinetics of nuclear reactions, laws of radioactive decay, tengretics of nuclear reactions, mass of nerroy balance of nuclear indexing, particularly on electolytes. Basics of colloidal chemistry systems, containment. Classification freactors into Y on nuclear chemistry and radiochemistry, nuclear entities, nuclear reactors, luel assemblies, active core, control systems, safety systems, containment. Classification freactors into Y on generations. Standard types of nuclear reactors. Science on nuclear areactors, Ferencias or generation II (EPR, AP-100, VVER 1200). Readors of generation INPPRO initiatives. Evaluation and selection of proposed systems. Six selected concepts. ICRP scenarios of word evolution, hydrogen power, role of nuclear power nin long-term outlook.         Z/ZK         4           DIMAT4         Mathematics 3         Z/ZK         4         4           Insert of laboratory provide computer, standard bypes of nuclear space.         Z/ZK         4           Insert and non-linear differential equations of higher order with constant coefficients. Multivariable calculus and its applications.         Z/ZK         4           Insubjencements         Z/Z			ké chemie a zpra	cování výsl	-	-	5
15FCHN2       Physical Chemistry 2       Z,ZK       5         excure of Physical Chemistry 2 locuses on thermodynamics of solutions, particularly on electolytes. Basics of colloidal chemistry extend the theory of solvents in the end of the lecture 15JACH1       Nuclear Chemistry 1       Z,ZK       3         Concept and history of nuclear chemistry and radiochemistry, nuclear entities, nuclear reactions, natural and artificial radioactivity. Kinetics of nuclear reactions, laws of radioactive feeray. Energetics of nuclear Reactors       ZK       2         ITJARE       Nuclear Reactors       ZK       2         Introduction. World power issue. Previous evolution of power reactors: concept, description, layout, previous evolution, world share, perspectives. Pressurized water reactors (PWR)         Western-type PWR (Westinghouse, KWU, Framatom). VVER-type reactors. Themelin nuclear power plant. Boiling water reactors, fast breeder reactors.       2       X       2         Nuclear standard types of nuclear are, reactors of generation III (EPR, AP-1000, VVER type) water reactors. Is lab treeder reactors.       10       2       X       4         Intervalued standard and theorems related to the study of finite-dimensional vector spaces.       Z,ZK       4       4         Intervalued standard and matural and natural lond autors of the first order. Linear differential equations of higher order with constant coefficients. Multivariable calculus and its applications.       1       Z,ZK       4         Interat and non-linear differential equations of the	and third law of thermodyna	mics and their applications. Last but not least, attention is devoted also to the thermodyn					
15JACH1       Nuclear Chemistry 1       Z,ZK       3         Concept and history of nuclear chemistry and radiochemistry, nuclear entities, nuclear reactions, nava and energy of lapha, beta decay, gamma deexcitation in nuclear reactions, laws of radioactive decay. Energetics of nuclear reactions, as and energy balance of nuclear indications, navarial and artificial radioactivity. Kinetics of nuclear reactions, laws of radioactive decay. Energetics of nuclear reactions, as and energy of lapha, beta decay, gamma deexcitation in nuclear reactions, laws of radioactive decay. Energetics of nuclear reactions, and energy of lapha, beta decay, gamma deexcitation in nuclear reactions, containment. Classification freactors into IV generations. Standard types of nuclear power reactors: concept, description, layout, previous evolution, evolt of share, perspectives. Pressuriced water reactors (FWR) vestinghouse, KWU, Framatom). VVER-type reactors in orgeneration III (EPR, AP-1000, VVER 1200). Reactors of generation IV: GIF and INPRO initiatives. Evaluation indiselection of proposed systems. Six selected concepts. ICRP scenarios of word evolution, hydrogen power, role of nuclear power in long-term outlook.         01MAT3       Mathematics 3       Z,ZK       4         10MAT4       Mathematics 4       Z,ZK       4         .inear and non-linear differential equations of the first order. Linear differential equations of higher order with constant coefficients. Multivariable calculus and its applications.         15DRCA2       Organic Chemistry 2       Z,ZK       6         16Devortory exercises is ordiented to qualitative analysis of cations and anions using wet chemistry procedures. Quantitative determination of analyte based upon various					Z	Z,ZK	5
Concept and history of nuclear chemistry and radiochemistry, nuclear entities, nuclear reactions, natural and artificial radioactivity. Kinetics of nuclear reactions, mass and energy balance of nuclei and energy of alpha, beta decay, gamma deexcitation in nuclear reactions.         17 JARE       Nuclear Reactors       ZK       2         17 JARE       Nuclear Reactors       ZK       2         Notelear Reactors       ZK       2         17 JARE       Nuclear Reactors       Check       2         17 JARE       Nuclear Reactors       Check       2         16 setupied tractors.       Standard types of nuclear reactors (PWR)       Restripted migrature gas cooled reactors. Standard types of nuclear reactors of generation IV: GIF and INPRO initiatives. Evaluation and selection of proposed systems. Six selected concepts. ICRP scenarios of word evolution, hydrogen power, role of nuclear power in long-term outlook       Z/XK       4         17 Ant       Mathematics 3       Z/ZK       4 <td></td> <td></td> <td>dal chemistry ext</td> <td>end the the</td> <td>-</td> <td></td> <td></td>			dal chemistry ext	end the the	-		
17JARE       Nuclear Reactors       ZK       2         ntroduction. World power issue. Previous evolution of power reactor. Nuclear fission reactors, fuel assemblies, active core, control systems, safety systems, containment. Classification freactors into V generations. Standard types of nuclear power reactors: concept, description, layout, previous evolution, world share, perspectives. Pressurized water reactors (PWR) westimyhouse, KWU, Framatom). VVER-type reactors of generation III (EPR, AP-1000, VER 1200). Reactors of generation IV: CIF and INPRO initiatives. Evaluation and selection of proposed systems. Six selected concepts. ICRP scenarios of word evolution, hydrogen power, role of nuclear power in long-term outlook       Z,ZK       4         DIMAT3       Mathematics 3       Z,ZK       4         Inear and non-linear differential equations of the first order. Linear differential equations of higher order with constant coefficients. Multivariable calculus and its applications.       Z,ZK       4         15ORCA2       Organic chemistry 2       Z,ZK       6         16SPCHA       Laboratory Training in Analytical Chemistry       Z       4         16SPCHA       Organic chemistry Practical       Z       4         17SPL       Z       4       4         16SPCHA       Laboratory Training in Analytical Chemistry       Z       4         15SPCHA       Organic chemistry Practical       Z       4         15SPCHA       Organic chemistry Practical       Z       4<	Concept and history of nucle	ear chemistry and radiochemistry, nuclear entities, nuclear reactions, natural and artifici			uclear reacti	, 1	-
ntroduction. 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) (Westinghouse, KWU, Framatom). VVER-type reactors, or temelin nuclear power plant. Boiling water reactors. Heavy water reactors, storedeer reactors, as theredeer reactors, as thereadore, and non-linear differential equations and theorems related to the study of finite-dimensional vector spaces.  DIMAT Mathematics 4 Z,ZK 4 Inter and non-linear differential equations of the first order. Linear differential equations of higher order with constant coefficients. Multivariable calculus and its applications.  ISORCA2 Organic chemistry 2 Z,ZK 6 ISORCA2 Organic chemistry 2 ISORCA2 Organic chemistry 4 Iso and pharmaceuticals - industrial and natural. Introduction to the metods of structural analysis.  ISAPLA Laboratory Training in Analytical Chemistry ISPOCHA Organic Chemistry Practical ISORCA Organic Chemistry Practical ISORCA Organic chemistry Practical ISORCA Organic chemistry have the task to teach students the basics of laboratory techniques and methodology of work in the organic caboratory. Synthetic tasks are chosen so that the students are			a deexcitation in	nuclear rea		71/	2
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 PVWR (Westinghouse, KWU, Framatom). VVER-type reactors, or generation III (EPR, AP-1000, VVER 1200). Reactors of generation IV: GIF and INPRO initiatives. Evaluation and selection of proposed systems. Six selected concepts. ICRP scenarios of word evolution, hydrogen power, role of nuclear power in long-term outlook         OTMAT3       Mathematics 3       Z,ZK       4         Inear and non-linear differential equations of the first order. Linear differential equations of higher order with constant coefficients. Multivariable calculus and its applications.       Z,ZK       4         Insear and non-linear differential equations of the first order. Linear differential equations of higher order with constant coefficients. Multivariable calculus and its applications.       Z,ZK       6         Inforduction to the second group of organic compounds, carboxylic acids and their derivatives, heterocyclic compounds, important natural compounds, industrial organic compounds industrial organic compounds, industrial and natural. Introduction to the metods of structural analysis.       Z       4         ISDPCLA       Organic Chemistry Practical       Z       4         The subic practices of organic chemistry Practical       Z       4         ISPOCHA       Organic Chemistry Practical       Z       4         The basic practices of organic chemistry Practical       Z       4			e core control sv	stems safe			
high-temperature gas cooled reactors. Second nuclear era. reactors of generation III (EPR, AP-1000, VVER 1200). Reactors of generation IV: GIF and INPRO initiatives. Evaluation and selection of proposed systems. Six selected concepts. ICRP scenarios of word evolution, hydrogen power, role of nuclear power in long-term outlook The subject summarises the most important notions and theorems related to the study of finite-dimensional vector spaces. DIMAT Mathematics 4 Z,ZK 4 inear and non-linear differential equations of the first order. Linear differential equations of higher order with constant coefficients. Multivariable calculus and its applications. 15ORCA2 Organic chemistry 2 Z,ZK 6 ntroduction to the second group of organic compounds, carboxylic acids and their derivatives, heterocyclic compounds, important natural compounds, industrial organic compounds and pharmaceuticals - industrial and natural. Introduction to the metods of structural analysis. 15APLA Laboratory Training in Analytical Chemistry Z C q First part of laboratory exercises is oriented to qualitative analysis of cations and anions using wet chemistry procedures. Quantitative determination of analyte based upon various itration procedures follows. In the last part of exercises students become acquainted with basic instrumental methods of chemical analysis. 15POCHA Organic Chemistry Practical The basic practices of organic chemistry Practical operations, and to obtain information on the preparation and properties of organic compounds. Students the basics of laboratory techniques and methodology of work in the organic alconatory. Synthetic tasks are chosen so that the students are acquainted with basic chemistry. 15POLE Theory of Electromagnetic Field and Waves The course comprises of three parts: the first part contains selected passages of the theory of the electromagnetic field, the second part is dedicated to the wave motion and the optics and the third part is the introduction to the atomic physics. 15ZBCHA Fundamentals of							
and selection of proposed systems. Six selected concepts. ICRP scenarios of word evolution, hydrogen power, role of nuclear power in long-term outlook         D1MAT3       Mathematics 3       Z,ZK       4         The subject summarises the most important notions and theorems related to the study of finite-dimensional vector spaces.       Z,ZK       4         D1MAT4       Mathematics 4       Z,ZK       4         .inear and non-linear differential equations of the first order. Linear differential equations of higher order with constant coefficients. Multivariable calculus and its applications.       5         155ORCA2       Organic chemistry 2       Z,ZK       6         ntroduction to the second group of organic compounds, carboxylic acids and their derivatives, heterocyclic compounds, important natural compounds, industrial organic compounds and pharmaceuticals - industrial and natural. Introduction to the metods of structural analysis.       Z       4         15APLA       Laboratory Training in Analytical Chemistry       Z       4         15FOCCHA       Organic Chemistry Practical       Z       4         The basic practices of organic chemistry Practical       Z       4         15POCHA       Organic Chemistry Practical       Z       4         The basic practices of organic chemistry Practical       Z       4         The basic practices of organic chemistry Practical       Z       4         15P	Western-type PWR (Westing	ghouse, KWU, Framatom). VVER-type reactors , Temelín nuclear power plant. Boiling w	ater reactors. He	avy water r	eactors, fast	breeder re	actors,
D1MAT3       Mathematics 3       Z,ZK       4         The subject summarises the most important notions and theorems related to the study of finite-dimensional vector spaces.       Z,ZK       4         D1MAT4       Mathematics 4       Z,ZK       4         inear and non-linear differential equations of the first order. Linear differential equations of higher order with constant coefficients. Multivariable calculus and its applications.       ISORCA2       Organic chemistry 2       Z,ZK       6         15ORCA2       Organic compounds, carboxylic acids and their derivatives, heterocyclic compounds, important natural compounds, industrial organic compounds and pharmaceuticals - industrial and natural. Introduction to the metods of structural analysis.       Isoaratory Training in Analytical Chemistry       Z       4         15POCHA       Laboratory Training in Analytical Chemistry       Z       4         15POCHA       Organic Chemistry Practical       Z       4         The basic practices of organic chemistry Practical       Z       4         The basic practices of organic chemistry Practical       Z       4         The basic practices of organic chemistry thave the task to teach students the basics of laboratory techniques and methodology of work in the organic laboratory. Synthetic tasks are chosen so that the students are acquainted with basic chemical operations, and to obtain information on the preparation and properties of organic compounds. Students thus have to supplement the theoretical knowledge from the lectures of	0 1 0	<b>o</b> ( ) , , , , , , , , , , , , , , , , , ,	0			RO initiative	es. Evaluation
The subject summarises the most important notions and theorems related to the study of finite-dimensional vector spaces.       Z,ZK       4         D1MAT4       Mathematics 4       Z,ZK       4         inear and non-linear differential equations of the first order. Linear differential equations of higher order with constant coefficients. Multivariable calculus and its applications.       ISORCA2       Organic chemistry 2       Z,ZK       6         Introduction to the second group of organic compounds, carboxylic acids and their derivatives, heterocyclic compounds, important natural compounds, industrial organic compounds and pharmaceuticals - industrial and natural. Introduction to the metods of structural analysis.       IsoPCHA       Laboratory Training in Analytical Chemistry       Z       4         Tist part of laboratory exercises is oriented to qualitative analysis of cations and anions using wet chemistry procedures. Quantitative determination of analyte based upon various itration procedures follows. In the last part of exercises students become acquainted with basic instrumental methods of chemical analysis.       Z       4         The basic practices of organic chemistry Practical       Z       4         The basic practices of organic chemistry have the task to teach students the basics of laboratory techniques and properties of organic compounds. Students thus have to supplement the theoretical knowledge from the lectures of organic chemistry.       Z       4         ISPOCLA       Organic Chemistry Practical       Z       4         The basic practices of organic chemistry			of nuclear powe	r in long-ter			
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ntroduction to the second group of organic compounds, carboxylic acids and their derivatives, heterocyclic compounds, important natural compounds, industrial organic compounds, and pharmaceuticals - industrial and natural. Introduction to the metods of structural analysis.          15APLA       Laboratory Training in Analytical Chemistry       Z       4         First part of laboratory exercises is oriented to qualitative analysis of cations and anions using wet chemistry procedures. Quantitative determination of analyte based upon various itration procedures follows. In the last part of exercises students become acquainted with basic instrumental methods of chemical analysis.       Z       4         15POCHA       Organic Chemistry Practical       Z       4         The basic practices of organic chemistry have the task to teach students the basics of laboratory techniques and methodology of work in the organic laboratory. Synthetic tasks are chosen so that the students are acquainted with basic chemistry.       Z       4         15POLE       Theory of Electromagnetic Field and Waves       Z,ZK       4         15POLE       Theory of Electromagnetic Field and Waves       Z,ZK       4         15POLE       Theory of Electromagnetic Field and Waves       Z,ZK       4         15ZBCHA       Fundamentals of Biochemistry       Z,ZK       2         15ZBCHA       Fundamentals of Biochemistry as well as basic biochemical pathways. The special attention is paid to make students understand interconnection of cell			ant coefficients. I	luitivariable	1		
15APLA       Laboratory Training in Analytical Chemistry       Z       4         First part of laboratory exercises is oriented to qualitative analysis of cations and anions using wet chemistry procedures. Quantitative determination of analyte based upon various itration procedures follows. In the last part of exercises students become acquainted with basic instrumental methods of chemical analysis.       Z       4         15POCHA       Organic Chemistry Practical       Z       4         The basic practices of organic chemistry have the task to teach students the basics of laboratory techniques and methodology of work in the organic laboratory. Synthetic tasks are chosen so that the students are acquainted with basic chemistry.       Isopole       Z,ZK       4         15POLE       Theory of Electromagnetic Field and Waves       Z,ZK       4         16POLE       Theory of Electromagnetic Field and Waves.       Z,ZK       4         16POLE       Theory of Blochemistry       Z       4         16POLE       Theory of Electromagnetic Field and Waves.       Z,ZK       4         The course comprises of three parts: the first part contains selected passages of the theory of the electromagnetic field, the second part is dedicated to the wave motion and the optics.       Z       2         15POLE       Fundamentals of Biochemistry       Z       2       2         15ZBCHA       Fundamentals of Biochemistry as well as basic biochemical pathways. The special attention is paid t		<b>o</b>	inds, important n	atural com		, 1	
First part of laboratory exercises is oriented to qualitative analysis of cations and anions using wet chemistry procedures. Quantitative determination of analyte based upon various itration procedures follows. In the last part of exercises students become acquainted with basic instrumental methods of chemical analysis.         15POCHA       Organic Chemistry Practical       Z       4         The basic practices of organic chemistry have the task to teach students the basics of laboratory techniques and methodology of work in the organic laboratory. Synthetic tasks are chosen so that the students are acquainted with basic chemical operations, and to obtain information on the preparation and properties of organic compounds. Students thus have to supplement the theoretical knowledge from the lectures of organic chemistry.       Image: Compound information on the preparation and properties of organic compounds. Students thus have to supplement the theoretical knowledge from the lectures of organic chemistry.       Image: Compound information on the preparation and properties of organic compounds. Students thus have to supplement the theoretical knowledge from the lectures of organic chemistry.         15POLE       Theory of Electromagnetic Field and Waves       Z,ZK       4         The course comprises of three parts: the first part contains selected passages of the theory of the electromagnetic field, the second part is dedicated to the wave motion and the optics and the third part is the introduction to the atomic physics.       Z       2         15POLA       Fundamentals of Biochemistry       Z       2         15POLE       Theory of Electromagnetic Field and Waves       Z       2	and pharmaceuticals - indus	strial and natural. Introduction to the metods of structural analysis.					
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15POLE       Theory of Electromagnetic Field and Waves       Z,ZK       4         15POLE       The course comprises of three parts: the first part contains selected passages of the theory of the electromagnetic field, the second part is dedicated to the wave motion and the optics and the third part is the introduction to the atomic physics.       Image: Comparison of the electromagnetic field, the second part is dedicated to the wave motion and the optics and the third part is the introduction to the atomic physics.         15ZBCHA       Fundamentals of Biochemistry       ZK       2         The course covers the whole field of a general biochemistry as well as basic biochemical pathways. The special attention is paid to make students understand interconnection of cell					-		
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and the third part is the introduction to the atomic physics.          15ZBCHA       Fundamentals of Biochemistry       ZK       2         The course covers the whole field of a general biochemistry as well as basic biochemical pathways. The special attention is paid to make students understand interconnection of cell	15POLE Th	eory of Electromagnetic Field and Waves			Z	,ZK	4
15ZBCHA   Fundamentals of Biochemistry   ZK   2 The course covers the whole field of a general biochemistry as well as basic biochemical pathways. The special attention is paid to make students understand interconnection of cell			eld, the second p	art is dedic	ated to the w	ave motion	and the optics,
The course covers the whole field of a general biochemistry as well as basic biochemical pathways. The special attention is paid to make students understand interconnection of cell						·	
			ention is paid to	make stude	nts understa	ind intercon	nection of cell
	processes essential for the l	II <del>U</del> .					

Code of the group: BSPJCH3 Name of the group: BS P\_JCHB 3rd year

### Requirement credits in the group:

Requirement courses in the group: In this group you have to complete at least 15 courses Credits in the group: 0

Note on the group:

Zápis předmětu 15JACH2 je podmíněn absolvováním předmětu 15JACH1.Zápis předmětu 15RATEC je podmíněn absolvováním předmětu 15JACH1.Zápis předmětu 15PINS je podmíněn současným zápisem nebo absolvováním předmětu 15INSN1.Zápis předmětu 15DEIZ je podmíněn současným

	Name of the course / Name of the group of courses					
Code	(in case of groups of courses the list of codes of their members)	Completion	Credits	Scope	Semester	Role
	Tutors, <b>authors</b> and guarantors (gar.)					
15BPCH1	Bachelor Thesis 1 Petr Distler, Martin VIk, Jan Bárta, Barbora Drtinová, Václav uba, Josef Filgas, Dušan Vopálka, Jan Král, Tereza Janská, Václav uba Václav uba (Gar.)	z	5	0+5	Z	Ρ
15BPCH2	Bachelor Thesis 2 Petr Distler, Martin Vlk, Jan Bárta, Barbora Drtinová, Václav uba, Josef Filgas, Dušan Vopálka, Jan Král, Tereza Janská, Lenka Prouzová Procházková Václav uba (Gar.)	Z	10	0+10	L	Ρ
17BPROV	Safe operation of nuclear facilities Lenka Frýbortová, ubomír Sklenka Lenka Frýbortová (Gar.)	KZ	2	2P		Ρ
15DIZ	Detection of Ionizing Radiation Jan John, Martin Da o Jan John Jan John (Gar.)	ZK	2	2+0	L	Ρ
15EXK1	<b>Excursion 1</b> Barbora Drtinová, Alena Zavadilová <b>Alena Zavadilová</b> Barbora Drtinová (Gar.)	Z	1	5 dn	L	Ρ
15INSN1	Instrumental Methods 1 Martin Vlk, Alena Zavadilová Martin Vlk	ZK	3	3+0	L	Ρ
15JACH2	Nuclear Chemistry 2 Václav uba, Merja Johanna Herzig, Xenie Lytvynenko, Jan John Václav uba Václav uba (Gar.)	Z,ZK	4	2+2	z	Ρ
15MZD	Measurement and Data Handling Aleš Vetešník, Dušan Vopálka, Lucie Baborová Aleš Vetešník Aleš Vetešník (Gar.)	Z,ZK	3	2+1	Z	Ρ
12NMEA	Numerical Methods for Scientists and Engineers Alena Zavadilová, Pavel Váchal Pavel Váchal (Gar.)	KZ	3	2+2	L	Ρ
15DEIZ	<b>Practical Exercises in Detection of Ionizing Radiation</b> Pavel Bartl, Mojmír N mec, Miroslava Semelová <b>Miroslava Semelová</b> Mojmír N mec (Gar.)	ΚZ	3	0+3	L	Ρ
15PRFCH	Practical Exercises in Physical Chemistry Kate ina Ušelová Kate ina Ušelová	Z	5	0P+4C	Z	Ρ
15PINS	Laboratory Practice in Instrumental Methods Martin VIk, Alena Zavadilová Martin VIk Alena Zavadilová (Gar.)	KZ	2	0+3	L	Ρ
15RATEC	Practical Exercises in Radiochemical Techniques Kate ina ubová, Pavel Bartl, Mojmír N mec, Miroslava Semelová Miroslava Semelová Mojmír N mec (Gar.)	КZ	2	0+2	z	Ρ
15SBP	Bachelor Thesis Seminar Barbora Drtinová, Alena Zavadilová Alena Zavadilová (Gar.)	Z	1	0+1	z	Ρ
16ZDOZ1	Fundamentals of Radiation Dosimetry 1 Tomáš Trojek Tomáš Trojek Tomáš Trojek (Gar.)	Z,ZK	4	2+2		Р

#### Characteristics of the courses of this group of Study Plan: Code=BSPJCH3 Name=BS P\_JCHB 3rd year

15BPCH1	Bachelor Thesis 1	Z	5				
Background research and results of research							
15BPCH2	Bachelor Thesis 2	Z	10				
Background research a	nd results of research						
17BPROV	Safe operation of nuclear facilities	KZ	2				
The aim of the subject i	s to familiarize students with basic principles of nuclear safety.						
15DIZ	Detection of Ionizing Radiation	ZK	2				
The first part of the cou	rse deals with the definitions, properties, and application of the detectors of ionising radiation (IR). In the second part, a deta	iled overview of th	e gas detectors,				
scintillation detectors, d	letectors for high energy IR, semiconductor detectors, and integrating solid state detectors is given. The last part of the cours	e reviews the prin	ciples of the				
statistical treatment of o	Jata, and limits of detection.						
15EXK1	Excursion 1	Z	1				
The excursion aims at r	nediating the students the acquaintance with various radiochemical and radiation methods used in practice.						
15INSN1	Instrumental Methods 1	ZK	3				
Overview of selected m	, odern instrumental methods of research and analysis, theoretical fundamentals, instrumental technique, utilization and appli	cation.					
15JACH2	Nuclear Chemistry 2	Z,ZK	4				
The following topics are discussed in detail in the course: Nuclear reactions yield, reaction cross section, excitation function. Fission reaction, spontaneous fission. Chemistry of atoms							
formed in a nuclear reaction, local temperature, atomic recoil and recoil energy, recoil of atom bound in a molecule, hot atom chemistry, retention, Szilard Chalmers reaction.							
15MZD	Measurement and Data Handling	Z,ZK	3				
Characteristics of statistical distribution functions (one-dimensional data), hypotesis testing, analysis of variance (ANOVA), correlation analysis, regression, statistical analysis of							
multidimensional data;	chemometrics; testing of analytical methods; numerical methods and computers in data processing						

12NMEA	Numerical Methods for Scientists and Engineers	KZ	3				
There are explained the basic principles of numerical mathematics important for numerical solving of problems important for physics and technology. Methods for solution of tasks ver							
important for physicists	(ordinary differential equations, random numbers) are included in addition to the basic numerical methods. Integrated compu	tational environm	ent MATLAB is				
used as a demonstratio	n tool. The seminars are held in computer laboratory and PASCAL is used as a principle programming language and MATLA	B is also used.					
15DEIZ	Practical Exercises in Detection of Ionizing Radiation	KZ	3				
This laboratory exercise	is a practical introduction to fundamental principles of detection of ionizing radiation (IR), interaction of IR with matter, and fun	ctionality and sett	ings of particular				
types of detectors and o	detection systems.						
15PRFCH	Practical Exercises in Physical Chemistry	Z	5				
Principles of fundament	al physico-chemical phenomena are demonstrated in ten exercises. Basic thermodynamic, kinetic and electrochemical charac	teristics, as equili	brium constants,				
rate constant, buffer cap	acity etc., are determinated. Required data are obtained by means of chemical analysis (e.g. titration, extraction) and by comm	ion instrumental r	nethods (UV-VIS				
spectrophotometry, pola	arography, potentiometry, conductometry, electrolysis, viscosimetry). Emphasis is given on appropriate interpretation of meas	ured data and the	ir mathematical				
and statistical evaluation	n.						
15PINS	Laboratory Practice in Instrumental Methods	KZ	2				
Practical training of stud	ents in the use of selected modern instrumental methods and techniques for determination of required parameters						
15RATEC	Practical Exercises in Radiochemical Techniques	KZ	2				
The exercise is oriented	on the training of students in laboratory praxis and work with open radioactive sources through basic lab operations such as	s pipetting, extrac	tion and				
chromatography technic	ues. Training is also focused on decontamination of surfaces and clean-up of the accident, work behind shielding and in a gle	ove box.					
15SBP	Bachelor Thesis Seminar	Z	1				
The aim is to prepare students to write and defend bachelor thesis, including work with information sources and to acquire basic presentation skills.							
16ZDOZ1	Fundamentals of Radiation Dosimetry 1	Z,ZK	4				
History, development, and objectives of dosimetry. Quantities and units used for description of sources, fields, interactions of ionizing radiation, ionizations, energy transfer and							
absorption. Fundamenta	als of the effects of ionizing radiation.						

## 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 <b>Jana Ková ová</b>	Z	1	0+2	L	PV
00RET	Rhetoric Jana Ková ová Jana Ková ová Jana Ková ová (Gar.)	Z	1	0+2		PV
00UPRA	Introduction to Law Martin ech Jana Ková ová	Z	1	0+2		PV
00UPSY	Introduction to Psychology Jakub Hají ek Jana Ková ová	Z	1	0+2		PV

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

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

Code of the group: BSPJAZYKYZK Name of the group: BS P languages Requirement credits in the group: Requirement courses in the group: In this group you have to complete at least 2 courses Credits in the group: 0 Note on the group:

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

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

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

04XRMZK Russian for Intermediate Students Examination	ZK	4
The course content is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the know	/ledge and skills a	acquired in RM1
- RM3. Students are eligible for the oral examination only after a prior pass in RM3 and a successful written examination. Students are given instruct	ions by the teach	er.
04XRPZK Russian for Advanced Students Examination	ZK	4
The course content is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the know	ledge and skills a	acquired in RP1
- RP3. Students are eligible for the oral examination only after a prior pass in RP3 and a successful written examination. Students are given instruction	ons by the teache	⊧r.
04XRZZK Russian for Beginners Examination	ZK	3
The course content is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the know	ledge and skills a	acquired in RZ1
- RZ5. Students are eligible for the oral examination only after a prior pass in RZ5 and a successful written examination. Students are given instruction	ons by the teache	r.
04XSMZK Spanish for Intermediate Students Examination	ZK	4
The course content is the examination as given by the study plan. SMZK examination consists of two parts - written and oral; to be eligible for the writte	n part, students w	ill have obtained
non-graded assessment for course SM3.Oral examination follows the written part.		
04XSPZK Spanish for Advanced Students Examination	ZK	4
The course content is the examination as given by the study plan. Examination SPZK consists of two parts, namely oral and written. The prerequisite I	for admission to o	ral part is having
passed the written test. Examination content is based on syllabi of courses SP1, SP2, and SP3 or on an individual study plan of the student.		
04XSZZK Spanish for Beginners Examination	ZK	3
The course content is the examination as given by the study plan. Examination consists of two parts - written and oral. Student can register for oral e	examination only i	f he/she has
passed the written examination test.		

#### Name of the block: Elective courses Minimal number of credits of the block: 0 The role of the block: V

Code of the group: BSPJCHV Name of the group: BS P\_JCHB 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
15CHEM	Analytical Calculations and Chemometry Principals Ji í Zima Ji í Zima Ji í Zima (Gar.)	ZK	2	2+0	Z	V
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
16EPAM	Exact Methods in Research of Historic Monuments Ladislav Musílek Ladislav Musílek Ladislav Musílek (Gar.)	ZK	2	2+0	Z	V
02PRAK	Experimental Laboratory Libor Škoda Libor Škoda (Gar.)	KZ	4	0+4	L	V
04AKS	English Conversation Jana Ková ová Jana Ková ová (Gar.)	Z	1	0+2	L	V
02KF	Quantum Physics Filip Petrásek Petr Jizba Petr Jizba (Gar.)	Z,ZK	3	2P+1C	Z	V
00MAM1	Essentials of High School Course 1 David B e	Z	1	0+1		V
00MAM2	Essentials of High School Math Course 2 Lukáš Heriban Severin Pošta Lukáš Heriban (Gar.)	Z	1	0+1		V
01PRSTB	Probability and Statistics B Tomáš Hobza Tomáš Hobza Tomáš Hobza (Gar.)	KZ	4	3+1	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 Aleš Materna, Ji í Martin ík Aleš Materna Aleš Materna (Gar.)	Z	2	26C		V
02UFEC	Introduction to Elementary Particle Physics Marek Matas, Jaroslav Biel ík Jaroslav Biel ík (Gar.)	Z	2	2+0	Z	V
18ZALG	Basics of Algorithmization Jan Tomsa, Petr Pauš, Vladimír Jarý, František Vold ich, Miroslav Virius, František Gašpar, Zuzana Pet í ková Vladimír Jarý Miroslav Virius (Gar.)	Z,ZK	4	2+2	L	V
16ZBAF1	Fundamentals of Human Biology, Anatomy and Physiology 1 Alena Doubková, Šimon Vaculín, Zde ka Polívková, Josef Stingl Alena Doubková Alena Doubková (Gar.)	Z,ZK	4	2+2	Z	V

	Fundamentals of Human Biology, Anatomy and Physiology					
16ZBAF2	Alena Doubková, Šimon Vaculín, Josef Stingl Alena Doubková Alena Doubková (Gar.)	Z,ZK	4	2+2	L	V
02ZJFY	Fundamentals of Nuclear Physics Vladimír Wagner Vladimír Wagner (Gar.)	Z,ZK	5	3P+2C	Z	V
18ZPRO	Basics of Programming Jan Tomsa, Petr Pauš, Vladimír Jarý, František Vold ich, Miroslav Virius, Zuzana Pet í ková, Nichita Vatamaniuc, Jan Vondruška, Maksym Dreval, Miroslav Virius Miroslav Virius (Gar.)	Z	4	4C	Z	V
	e courses of this group of Study Plan: Code=BSPJCHV Name=I	BS P_JCHB C	Optional			
	nalytical Calculations and Chemometry Principals			1	ZK	2
	nciples of chemometry including errors in classical and instrumental analysis, probabilit					
-	ng, hypothesis testing, least squares regression and correlation, calibration and fitting n try of redox, acid-base, complex and precipitation reactions, gravimetric stoichiometry. p	-		-	-	-
-	aration methods, solving of complex and precipitation reactions, gravimente stolchometry, p			potention	etry, coulonie	u y,
	story of Physics 1				Z	2
-	system of sciences. The relationship of man and nature. Natural sciences in ancient Or	rientand Greece, (	Greek natur	al philosoph	- 1	_
Helenistic period, Archimed	I. Arabic science, European science in Middle Ages. Renaissance - da Vinci, Giordano I	Bruno. Copernicus	s, Kepler, Ga	alileo, Huyge	ens. The birth	of physics
as experimental science. N	ewton and his work.					
	story of Physics 2				Z	2
	echanics after Newton, Bernoulli's, Euler, Lagrange. Historical development of optics, c	-			-	
-	lectrodynamics and electromagnetism, Faraday and Maxwell. Thermodynamics and its	-	-			-
	nck and Einstein. Discovery of radioaktivity, structure of atom, atomic nucleus, Rutherfo pt of Nature and Universe of today.	rd and Bonr. The V	way to nucle	ar energy, E	ementary pa	irticles,
	kact Methods in Research of Historic Monuments				ZK	2
	c monument investigations, methods of age determination (radiocarbon, thermoluminescen	ice and related me	thods furthe	1	1	
	ical methods for determination of origin and production technologies of artefacts (activa					
photogrammetry.						
02PRAK Ex	kperimental Laboratory				KZ	4
Lecture is intended primaril	y for students who study branch Nuclear Chemistry engineering, or practically oriented	bachelor's specia	lizations of I	branch Nucl	ear engineeri	ng. But it can
-	interested in the other specializations. During Experimental laboratory, students learn h		-			-
	easurement (acquire of different experimental procedures and routines), will teach writin	ig the records of m	leasuremen	t, processin	g and evaluati	on of results.
	v extend the knowledge gained in lectures on physics.				Z	1
	nglish Conversation student´s communication skills acquired throughout their previous studies. It aims to irr	norove all aspects	of oral com	 munication	- 1	•
	communication situations and will master their communication strategy. They will also					
in discussions. The student	will be trained to express their ideas clearly and according to current English usage, an	nd become a more	confident s	peaker.		
02KF Q	uantum Physics			Z	"ZK	3
	ction, postulates of quantum mechanics, Born s statistical interpretation, expectation va	alues, Schrödinge	r equation,	Heisenberg	uncertainty p	rinciple,
	nentum, solution of simple systems, hydrogen atom.					
	ssentials of High School Course 1				Z	1
	mathematical concepts and methods used in the introductory physics course. ssentials of High School Math Course 2				Z	1
Review of basics of high sc				I	Z	I
,	robability and Statistics B				KZ	4
	bility theory and mathematical statistics. The probability theory is build gradually beginr	ning with the class	ical definitio			-
	ndom variable, distribution function of random variable and characteristics of random variable					
On the basis of this theory	the basic methods of mathematical statistics such as estimation of distribution parameter	ers and hypothesi	s testing are	e explained.		
	nysical Education				Z	1
TV-2 Pł	nysical Education				Z	1
	nysical education				Z	1
TV-4 Pł	nysical education				Z	1
14TED C	reating Electronic Documents				Z	2
-	presenting student theses. Individual exercises focus on creating and formatting texts,	equations, charts,	tables, pres	sentations a	nd entire doc	uments in an
office suite.						
	troduction to Elementary Particle Physics				Z	2
	sily accessible introduction to elementary particle physics. Development, methods, goal	s and perspective	s of the sub			
	asics of Algorithmization	aathada far tha da	termination	1	,ZK	4
	elected algorithms and methods for algorithm design. This course intruduces selected n andamentals of Human Biology, Anatomy and Physiology 1	nethous for the de	termination			4
	ms, non-cellular and cellular organisms, prokaryotic and eukaryotic cell. Molecular and	cell biology Biopo	lymers Mol		.,ZK   tics. Cell.cvcle	
	man anatomy. Basics of medical terminology. Overview of tissues. Skeleton. Muscle and		-	-	-	
-	espiration. Excretory and genital tract.	, <u>,</u>	5			
	undamentals of Human Biology, Anatomy and Physiology 2			Z	"ZK	4
	diac activity. General anatomy of blood vessels, main arteries of the body, overview of	veins and physiolo	gy of blood		·	of nerves.
	ysiology of the visual system. Auditory and vestibular system and physiology of hearing	and balance. Ski	n, endocrine	-	<u>.</u>	
	undamentals of Nuclear Physics				"ZK	5
	formidable challenges both experimentally and theoretically, simply because we are de	-	-	c domain, w	here much of	our classical
Intuition regarding the beha	viour of objects fails us. The lecture is a basic introduction to very interesting regions of	subatomic physic	s.			

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 program	nming and with th	e Python
programming language			

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

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
04XAM1	English for Intermediate Students M1 Jana Ková ová	Z	2	0+2	Z	V
04XAM2	English for Intermediate Students M2 Jana Ková ová	Z	2	0+2	L	V
04XAM3	English for Intermediate Students M3 Jana Ková ová	Z	2	0+2	Z	V
04XAP1	English for Advanced Students P1 Jana Ková ová	Z	2	0+2	Z	V
04XAP2	English for Advanced Students P2 Jana Ková ová	Z	2	0+2	L	V
04XAP3	English for Advanced Students P3 Jana Ková ová	Z	2	0+2	Z	V
04XCESZ1	Czech for Foreigners - Beginners 1 Jana Ková ová Jana Ková ová (Gar.)	Z	2	0+2	Z	V
04XCESZ2	Czech for Foreigners - Beginners 2 Jana Ková ová Jana Ková ová (Gar.)	Z	2	0+2	L	V
04XCESZ3	Czech for Foreigners - Beginners 3 Jana Ková ová Jana Ková ová (Gar.)	Z	2	2S	Z	V
04XCESM1	Czech for Foreigners - Intermediate 1 Jana Ková ová Jana Ková ová (Gar.)	Z	2	0+2	Z	V
04XCESM2	Czech for Foreigners - Intermediate 2 Jana Ková ová Jana Ková ová (Gar.)	Z	2	0+2	L	V
04XCESM3	Czech for Foreigners - Intermediate 3 Jana Ková ová Jana Ková ová (Gar.)	Z	2	0+2	Z	V
04XCESP1	Czech for Foreign Students - Advanced 1 Jana Ková ová Jana Ková ová (Gar.)	Z	2	0+2	Z	V
04XCESP2	Czech for Foreigners - Advanced 2 Jana Ková ová Jana Ková ová (Gar.)	Z	2	0+2	L	V
04XCESP3	Czech for Foreigners - Advanced 3 Jana Ková ová Jana Ková ová (Gar.)	Z	2	0+2	Z	V
04XFM1	French for Intermediate Students M1 V ra Šlechtová V ra Šlechtová (Gar.)	Z	2	0+2	Z	V
04XFM2	French for Intermediate Students M2 V ra Šlechtová V ra Šlechtová (Gar.)	Z	2	0+2	L	V
04XFM3	French for Intermediate Students M3 V ra Šlechtová V ra Šlechtová (Gar.)	Z	2	0+2	Z	V
04XFP1	French for Advanced Students P1 V ra Šlechtová V ra Šlechtová (Gar.)	Z	2	0+2	Z	V
04XFP2	French for Advanced Students P2 V ra Šlechtová V ra Šlechtová (Gar.)	Z	2	0+2	L	V
04XFP3	French for Advanded Students P3 V ra Šlechtová V ra Šlechtová (Gar.)	Z	2	0+2	Z	V
04XFZ1	French for Beginners Z1 V ra Šlechtová V ra Šlechtová (Gar.)	Z	2	0+4	L	V
04XFZ2	French for Beginners Z2 V ra Šlechtová V ra Šlechtová (Gar.)	Z	2	0+4	Z	V
04XFZ3	French for Beginners Z3 V ra Šlechtová V ra Šlechtová (Gar.)	Z	2	0+4	L	V
04XFZ4	French for Beginners Z4 V ra Šlechtová V ra Šlechtová (Gar.)	Z	2	0+4	Z	V
04XFZ5	French for Beginners Z5 V ra Šlechtová V ra Šlechtová (Gar.)	Z	2	0+4	L	V
04XNM2	German for Intermediate Students M2 Miloslava echová Miloslava echová (Gar.)	Z	2	0+2	L	V
04XNM1	German for Intermediate Students M1 Miloslava echová Miloslava echová (Gar.)	Z	2	0+2	Z	V
04XNM3	German for Intermediate Students M3 Miloslava echová Miloslava echová (Gar.)	Z	2	0+2	Z	V

04XNP1	German for Advanced Students P1 Miloslava echová Miloslava echová (Gar.)	Z	2	0+2	Z	V
04XNP2	German for Advanced Students P2 Miloslava echová Miloslava echová (Gar.)	Z	2	0+2	L	v
04XNP3	German for Advanced Students P3 Miloslava echová Miloslava echová (Gar.)	Z	2	0+2	Z	V
04XRM1	Russian for Intermediate Students M1 Zhanna Isaeva Zhanna Isaeva (Gar.)	Z	2	0+2	Z	V
04XRM2	Russian for Intermediate Students M2	Z	2	0+2	L	v
04XRM3	Zhanna Isaeva Zhanna Isaeva (Gar.)           Russian for Intermediate Students M3	Z	2	0+2	Z	v
04XRP1	Zhanna Isaeva Zhanna Isaeva (Gar.) Russian for Advanced Students P1	Z	2	0+2	Z	v
04XRP2	Zhanna Isaeva Zhanna Isaeva (Gar.)           Russian for Advanced Students P2	Z	2	0+2	L	V
04XRP3	Zhanna Isaeva Zhanna Isaeva (Gar.)           Russian for Advanced Students P3	Z	2	0+2	Z	V
04XRZ1	Zhanna Isaeva Zhanna Isaeva (Gar.) Russian for Beginners Z1	 Z	2	0+4		v
04XRZ2	Zhanna Isaeva Žhanna Isaeva (Gar.) Russian for Beginners Z2	Z	2	0+4	Z	V
04XRZ3	Zhanna Isaeva Žhanna Isaeva (Gar.) Russian for Beginners Z3	Z	2	-		-
	Zhanna Isaeva Zhanna Isaeva (Gar.)           Russian for Beginners Z4			0+4	L	V
04XRZ4	Zhanna Isaeva Zhanna Isaeva (Gar.)       Russian for Beginners Z5	Z	2	0+4	Z	V
04XRZ5	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
04XAM1 E The course is designed for	ne courses of this group of Study Plan: Code=BSPJAZYKYZAF inglish for Intermediate Students M1 students who have successfully completed the full secondary school English languag	je course at least at	the A2 leve	l of the Com		
professional oral and writte	es (CEFR). It provides an introduction into English for Specific and Academic Purpose en communication situations. Thus it covers topics related to the student's life and nee					
04XAM2 E	of grammar issues used in EAP. Inglish for Intermediate Students M2 he student to have completed the AM1 course. It develops their skills for work with sut	htechnical taxts for	using also r			2 functions
	ESP and EAP (e.g., definition, existence and classification of phenomena, object descri		-		-	
04XAM3 E The course develops the sl understanding of profession	inglish for Intermediate Students M3 kills that enable students to cope with features typical of professional style. Increasing a nal texts. Great emphasis is placed on distinguishing different levels of formal and info	ormal oral and writte	en communi	cation and th	neir appropria	ate Czech
equivalents. The course als student's field.	so includes studying abstracts and rules for writing them as well as basic rules for pre	paring and giving a	short prese	ntation on a	chosen topic	related to the
The course is designed for	nglish for Advanced Students P1 • students who have successfully completed the full secondary school English languag •s - CEFR). It provides an introduction into English for Specific and Academic Purpose	- ·				
grammar, and style typical covers professional oral an	of professional oral and written communication situations (fundamentals of terms in n d written communication on topics related to the undergraduate's life and needs. It deve y, revision of selected grammar topics is included.	nathematics and ph	ysics, defini	tions, graph	descriptions,	etc). It also

polite request). If necessary, revision of selected grammar topics is included.

04XAP2	English for Advanced Students P2	Z	2
The AP2 course is base	ed on AP1, thus extending the student's skills for working with subtechnical texts, and even with professional texts of chosen	branches of scien	nce. According to
	oncentrates on chosen grammar topics, but mainly intends to develop understanding of syntactic structures and typical rheto		• •
	possible, a case study). Increasing emphasis is placed on the undergraduate's independent work with and reading of linguisti	-	-
	student's subtechnical vocabulary, and includes fundamental notions of chosen branches of science. It is focused on formal king, cohesion and coherence in texts.	writing including th	he sentence and
04XAP3	English for Advanced Students P3	Z	2
	d on AP2 and expects the student to work without any guidance with authentic professional materials and to interpret the text.	-	
	nd functions (e.g., expressing an opinion, agreement, and objections; taking part in discussion, note-taking; summarizing, wri t on a given or chosen topic and presenting it. The course places emphasis on distinguishing levels of formal and informal lar		
04XCESZ1	Czech for Foreigners - Beginners 1	Z	2
	for students of the English programme. Students will become acquainted with the main characteristics of Czech (phonetic ar	1 – 1	1
acquire basic language	and speaking skills. The course focuses on pronunciation exercises, simple social phrases, and oral and written communicat	-	
04XCESZ2	covers roughly lessons 1-3 of eština Express (Czech Express) by L. Holá and P. Bo ilová.	Z	2
	munication competences acquired in CESZ1 are further developed. Students deepen their knowledge of the declension and		_
	pics. The course covers roughly lessons 3-5 in Czech Express by L. Holá and P. Bo ilová.		
04XCESZ3	Czech for Foreigners - Beginners 3	Z	2
	clops the language and communication competences acquired in the XCESZ1 and XCESZ2 courses. The teaching focuses of	• •	
	tion and deepening grammar, features through practice, as well as introducing the Czech culture. Students are asked to prod ue. They also practise understanding texts in terms of main ideas or looking for specific details in texts. The course covers roug	-	
04XCESM1	Czech for Foreigners - Intermediate 1	Z	2
The course is focused o social situations.	n correct pronunciation, important morphological phenomena, prepositional phrases, and verb forms as well as on extending the	he student's vocab	oulary for various
04XCESM2	Czech for Foreigners - Intermediate 2	Z	2
	e topics covered in CESM1 and is then focused on more difficult grammar phenomena. It practices writing, speaking, and rea	1 1	1
in understanding comm	on abbreviations, abbreviated words, and mathematical terms and formulas.	-	
04XCESM3	Czech for Foreigners - Intermediate 3	Z	2
	morphological topics covered earlier and extends the student's knowledge of more difficult language phenomena. It is espec	cially focused on s	stylistics and
	oping the student's writing skills.		
04XCESP1	Czech for Foreign Students - Advanced 1	Z	2
	course is very good knowledge of the Czech language, i.e., communicative competences at least at level B2 of the Common E evision of standard language structures, but mainly on practising more complex grammatical structures typical of the style of		
	e of engineering and professional communication, both in spoken and written form. The topics include University Studies and		
	n with teachers and faculty administrators.		•
04XCESP2	Czech for Foreigners - Advanced 2	Z	2
	e student's knowledge acquired in CESP1 and focuses on difficult language phenomena. It practises working with technical a	and specialist texts	s placing greater
emphasis on individual			
04XCESP3	Czech for Foreigners - Advanced 3 e student's knowledge from CESP2. It includes working with authentic specialist materials, their interpretation and presentation	Z	2
	g skills necessary for professional communication are trained.	on, and, many, pre	esentation of the
04XFM1	French for Intermediate Students M1	Z	2
	M The objective of this three-semester course is to improve and further develop communication in the French language in bo	1 1	1
will be able to communi	cate in social interaction and in academic, scientific and professional environment. They will be able to use the language to tr	ransmit general ar	nd technical
	e problems. FM1 The course builds on and further develops linguistic competence acquired at secondary school. It revises, sy	, ,	
° '	s study. The following topics are covered: University studies in our country and in France, writing of transactional letters, CV, pe Iture and geography, Paris. Topics of specialization: mathematics, physics. Reading technical and popular science texts, work		•
04XFM2	French for Intermediate Students M2	Z	2
	TM1. Linguistic structures and competence acquired in previous study are systemized and expanded. Reading popular science	1 1	1
	(passives, nominalization, word formation). Topics: physics, power engineering, environment, Internet, success of French sci		
scientists, artists and a	rchitects. Description of an object, device, shapes, dimensions, material.		
04XFM3	French for Intermediate Students M3	Z	2
	on improvement and further development of linguistic competence acquired during the follow-up courses. Syntactic structures (		
	mpound tenses). Text summaryStudents prepare a written paper which will be delivered in form of an oral presentation in-c		
	specialisation or to their interest and generally covers a technical /applied science topic. It is not a translation but a creative w Ige/experienceLonger monologues on topics /situations set for the examination are prepared. Text structure, cohesion and o	-	n French articles
04XFP1	French for Advanced Students P1	Z	2
-	the objective of this three-semester course is to improve and further develop communication in the French language in both w	1 – 1	
	e in social interaction and in academic, scientific and work environment. They will be able to use the language to transmit gen		
	The course builds on and further develops linguistic competence acquired at secondary school. Difficult grammar topics are re		
	ait, pronouns. The following specific topics are covered: University studies in our country and in France, writing of transaction		
	dvert, environmental issues, success of French science and technology, chosen topics from French regional culture, Paris. Top	ics of specializatio	on: mathematics,
	istry. Reading of technical and popular science texts, further work with these texts and interpretation.		
04XFP2	French for Advanced Students P2 ents, the course further develops language skills. Focus is put on reading popular science texts and on oral communication o	Z	2
	communication are stressed (passive voice, nominalization, word formation).	n given topics. re	atures typical U
04XFP3	French for Advanded Students P3	Z	2
	in systemization and improvement of acquired linguistic competence, skills and knowledge, and their use for communication in	I I	1
	rter texts (both from and into the language). Writing of a paper and making oral presentation in-class. The paper generally co		-
	rk compiled from 3 French sources. Preparation of several set topics for oral examination.		

04XFZ1	French for Beginners Z1	Z	2
French for beginners Th	he objective of this 5-level course is to be able to communicate in French orally and in writing in situations of everyday life, in	socializing and in r	professional life.
	ench for specific / technical communication and reading of popular science and scientific texts. FZ1 The objective is to be able		
	knowledge of chosen elementary language. The contents is roughly outlined by lessons 1 - 7 of the textbook Pravda - Pravde		s
	te ky). It is extended with situations of communication and functions from the textbook Espaces I, lessons 1-4 : introductions	-	tion, asking and
<b>0 0</b>	nple instructions and questions. Special attention is paid to pronunciation. Spelling is explained in connection with pronuncial	ion and grammar.	
04XFZ2	French for Beginners Z2	Z	2
	with FZ1. Elementary linguistic knowledge and communication skills are expanded. The scope is given by lessons 8 - 13 of the statistical tables and skills are filled in from the tauthories of the scope 1. 5. (introductions in station under statistical tables).		
•	Additional topics and skills are filled in from the textbook Espaces I, lesson 1 - 5 (introductions, invitation, welcoming, agreem o of France, food, expression of will, wish, order, prohibition, pleasure). Correct pronunciation is practiced. Stress on oral comm	•	
	work? A few expressions concerning the study. Name of University and Faculty.	unication. Opecine	topics covered.
04XFZ3	French for Beginners Z3	Z	2
	FZ2. Basic linguistic knowledge and skills are developed. The contents is given by lessons 14 - 18 of the textbook: Pravda - F		
	tuations are complemented from other materials. Stress is put on oral communication in dialogues and on reading, both for ir		°
• •	Reading covers short adapted texts of general interest first, and later popular science texts.		a ao part or
04XFZ4	French for Beginners Z4	Z	2
-	n FZ3. Basic linguistic knowledge and skills are further developed. Oral communication and reading skills are practiced. The c		
	xtbook French for Beginners, and is expanded with topics and functions from other materials. Reading is developed from the lea		
Students of FJFI. The c	ourse covers generals and specific topics: health- illness, sport, free time, environment, study, travelling in France, Paris, sho	pping, weather, un	iversity in our
country and in France,	how to write CV, application, topics in mathematics, reading physics - mechanics, informatics, internet.		
04XFZ5	French for Beginners Z5	Z	2
All four skills acquired in	FZ4 are further developed, as well as technical language. Students prepare a paper on a chosen popular science topic. The	y present it orally i	n the class. The
general contents is cove	ered by lessons 24 - 26 of the textbook: Pravda-Pravdova, French for Beginners, and is complemented from other materials.	Topics: on physics	from lecture
notes, success of Frence	ch science and technology, information about France. Grammar is systemized and complemented with syntax (subordinate cl	auses, typical conj	unctions,
subjunctive clauses, ge			
04XNM2	German for Intermediate Students M2	Z	2
The course introduces of	other more complex grammatical structures and their application in communication based on technical texts, such as the relation	n between technol	ogy and society,
-	ng of the 21st century, linguistically more demanding texts on the environment, the language of mathematics, computers and		
	mation and reading aloud, and appropriate language for various purposes in oral and written communication. The course system	natically revises ot	her grammatical
	or professional discourse (participles, relative clauses).		
04XNM1	German for Intermediate Students M1	Z	2
	Irse is to level off the students' skills in the German language. The course focuses on revision of more difficult phenomena an		
	es (e.g. importance of verb prefixes). In the lexical part, it covers topics referring to higher education in both the Czech Reput	-	
	gether with all necessary expressions and phrases, expressions and phrases needed to chemists, mathematicians, physicis	is, and the fundam	ientals of II
	communication on related topics and is aimed at correct pronunciation, grammatical correctness and understandability.		
04XNM3	German for Intermediate Students M3	Z	2
	ther more complex grammatical structures and their application in communication based on technical texts, such as the relation		•••
•	ng of the 21st century, linguistically more demanding texts on the environment, the language of mathematics, computers and	0,	
	mation and reading aloud, and appropriate language for various purposes in oral and written communication. The course syster or professional discourse (participles, relative clauses).	natically revises of	ner grammatical
		7	2
04XNP1	German for Advanced Students P1 od grammar knowledge, extended general vocabulary, and good communication skills acquired at secondary school to be le	Z	2 sinning of the
	the focused on working with technical and scientific texts and practising reading techniques (skimming, scanning, reading for		° °
	tructures necessary for understanding a subtechnical text (passive voice, participles, participle structures) and it also focuses on	,	
i.e., telephoning.	מיטנערפי הפניפיזמו א וויי הוועריזמות אין א משנפירווונימו נפגי (ממשר אטנפי, אמי ונטאופי, אמי ונטאופי אינטנערפי) מות המוסט וטנעספי טרי	practical everyday	communication,
04XNP2	German for Advanced Students P2	Z	2
	e students' skills in working with professional scientific texts (understanding, summarising, note-taking, interpreting) while extend		
	budgets skills in working with professional solentific texts (understanding, summarsing, note-taking, interpreting) with extend bduces mathematical expressions and texts of nuclear power engineering. Increasing emphasis is placed on understanding and	0 0	
	V, letter of application, interview, scholarship), and more complex grammatical structures (i.e., subjunctive, indirect speech).	i practising torman	communication,
04XNP3	German for Advanced Students P3	Z	2
	3 main parts (general communicative situations, grammar and technical topics). Students will develop their vocabulary in a va r accidents, accident report, filling in a form, complaints). Based on presentations and technical and subtechnical texts, the v		
· ·	ing, the environment, computer science, and car technology, will also be extended. Only authentic professional texts are use	, ,	
	process information gained from their reading of complex and difficult texts and present it to the class in a simplified oral form. 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	I I	
-	mmunication in everyday situations (introductions, socializing, greetings, shopping for food and objects of everyday need, ask		
	nmar structures (verbal and nominal forms, irregular verbs, pronouns). The initial knowledge corresponds to the achievement	• • •	<b>e</b> 7.
contents and scope of t	he 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.	I	
04XRM3			-
		Z	2
The course develops the	Russian for Intermediate Students M3 e knowledge and skills acquired in RM1 and RM2 and its contents and scope are roughly at the same level as those of RZ5, h	Z Z owever, for half of t	
The course develops the in the timetable.	Russian for Intermediate Students M3		
	Russian for Intermediate Students M3 e knowledge and skills acquired in RM1 and RM2 and its contents and scope are roughly at the same level as those of RZ5, h	owever, for half of	
in the timetable. 04XRP1	Russian for Intermediate Students M3	owever, for half of	the time allotted
in the timetable. 04XRP1 The entrance requirement	Russian for Intermediate Students M3 e knowledge and skills acquired in RM1 and RM2 and its contents and scope are roughly at the same level as those of RZ5, h Russian for Advanced Students P1	owever, for half of	the time allotted
in the timetable. 04XRP1 The entrance requirement	Russian for Intermediate Students M3 e knowledge and skills acquired in RM1 and RM2 and its contents and scope are roughly at the same level as those of RZ5, h Russian for Advanced Students P1 ent for the course is to achieve the B1 CEFR level. The objective of the course is revision of standard language structures, pro-	owever, for half of	the time allotted
in the timetable. 04XRP1 The entrance requirement structures, understandin 04XRP2	Russian for Intermediate Students M3 e knowledge and skills acquired in RM1 and RM2 and its contents and scope are roughly at the same level as those of RZ5, h Russian for Advanced Students P1 ent for the course is to achieve the B1 CEFR level. The objective of the course is revision of standard language structures, pro- ng the fundamentals of technical language and training writing skills.	owever, for half of Z	the time allotted 2 cult grammar 2

04XRP3	Russian for Advanced Students P3	Z	2
	RP2 and is mainly focused on working with technical and scientific texts (reading comprehension, oral and written paraphra:	I – I	1
	revious knowledge of general language at secondary level (listening, reading, correct communication in everyday situations).		· ·
	dy is aimed at professional and technical skills (reading technical literature according to the students' specialization, oral and	•	,
	cal vocabulary and practice quick and correct communication in professional situations. They will be able to both speak write	accurately and wit	th confidence on
technical topics.			
04XRZ1	Russian for Beginners Z1	Z	2
The course represents	the first stage of the five-semester programme, its final aim being reading and understanding professional texts written in Russ	sian. Thus it begin	s with mastering
the Russian alphabet (f	or both reading and writing skills) and fundamentals of grammar necessary for everyday communication (listening and speak	king). Students will	l be able to read
	d stress, understand its contents and summarize it.	0,	
04XRZ2		7	2
-	Russian for Beginners Z2	, <u> </u>	1
	f the programme is designed to teach skills for basic communication in everyday situations and for reading easy and short su		
	sing short sentences and appropriate structures, and read aloud with confidence a short text without marked stress. They will	also develop their	r vocabulary and
master further grammat	tical structures. They will have mastered with confidence the Russian alphabet and will be able to use it in writing.		
04XRZ3	Russian for Beginners Z3	Z	2
The course is based on	RZ2 and includes further everyday topics, develops understanding of short compact texts on new subtechnical topics (for train	ning various forms	s of reading skills
	duces new grammar. Students will be trained to distinguish intonation patterns while listening to spoken language. They will b	-	-
	ress their opinion. Writing skills will be trained on guided writing tasks and note-taking.		
			-
04XRZ4	Russian for Beginners Z4	Z	2
The course is based on	RZ3. It improves and expands the knowledge of general language in all four skills (reading and understanding longer texts with	a certain percent	age of unfamiliar
words, oral communicat	tion in everyday situations, writing longer texts). Students are trained to use grammar structures effectively (e.g., irregular ver	bs, differences in	verb patterns
from Czech, modality, ir	nperatives, conditionals). They practice and develop communication skills for everyday situations (food, travelling, free time),	and practice oral	and written
communication on more	e specific topics (environment, addictions, the green movement). They become acquainted with various geographical data (e.	.g., Siberia), learn	how to fill in
	mation from the timetable, learn about Russian holidays and typical meals.		
04XRZ5		7	2
	Russian for Beginners Z5	, <u> </u>	_
	student to have completed RZ4. It concentrates predominantly on reading skills (working with professional texts, i.e. understan	<b>e</b> . <b>e</b>	•
	ialized text) and speaking, and to a certain extent, writing about the professional information obtained by reading the texts. Co		
everyday topics. Studyi	ng grammar is based on professional and technical texts and only includes items typically used in professional communicatio	n (verbal adjective	es, participles,
passive voice). Students	s develop their technical and economic vocabulary, and are also trained in some professional skills (writing a CV, polite reque	∋st, etc.)	
04XSM1	Spanish for Intermediate Students M1	Z	2
	for students whose competence is at level B1 of CEFR, i.e. those who studied Spanish in the secondary school. The 3-seme	ester course devel	lops standard
-	tention to further grammar topics (e.g., perifrasis verbales, futuro imperfecto, direct object and indirect object pronouns, nega		-
	and oral communication on a given everyday or easy subtechnical topic, for which the students are trained by reading texts o		
04XSM2	Spanish for Intermediate Students M3		2
The course develops th	e students' knowledge from the previous course (SM1). Students are gradually acquainted with fundamentals of Spanish for	specific purposes	s in order to be
able to work with specia	alized texts on the Internet.		
04XSM3	Spanish for Intermediate Students M3	Z	2
	upplemented with additional subtechnical materials, so the students will be gradually acquainted with the peculiarities of acad		
e e	net in Spanish and search for information of their specialization or field of interest. Students will use the information to write s	non anicles and s	summanes. The
	nme, general Spanish course based on course books, covers presentations and, finally, a written and oral examination.		
04XSP1	Spanish for Advanced Students P1	Z	2
Course concentrates or	n more difficult grammar topics, revision of vocabulary, basics of Spanish for specific purposes as well as written communicati	ion. Course prerec	quisites: level B2
of CEFR.			
04XSP2	Spanish for Advanced Students P2	Z	2
		I I	1
	ond part of the advanced Spanish course, extending Spanish for specific purposes topics. It comprises more grammar and sy	max and locuses	on independent
written communication.		1	
04XSP3	Spanish for Advanced Students P3	Z	2
Course SP3 is the final	part of the advanced Spanish course. It is based on texts chosen by the students according to their future specialization. It is	focused on writter	n communication
based on what students	s will need in their career.		
04XSZ1	Spanish for Beginners Z1	Z	2
	stage of the five-semester programme of Spanish studies; during the first stage the students will master phonetics and fundar	I I	1
		-	
	e at an elementary level on topics of everyday life. They will acquire and extend fundamental vocabulary of general Spanish a	· · ·	
04XSZ2	Spanish for Beginners Students Z2	Z	2
Course SZ2 is based or	n course SZ1, and expects students to develop and extend the knowledge and skills acquired so far. Grammar structures and le	exis will be choser	n so as to enable
them to understand sho	ort adapted written texts and speech. Attention is also paid to cultural differences between Spanish-speaking countries and ot	thers such as the	Czech Republic.
Realia of Spanish-spea	king countries are also included.		
04XSZ3	Spanish for Beginners Z3	Z	2
	course SZ2, and develops the student's vocabulary and grammar structure. The course covers realia (history and culture) o	I I	1
	attention to further grammar topics (pretérito perfecto, pretérito indefinido, pretérito imperfecto, the gerund and the imperativ		-
		e). It includes with	len and orai
-	ren general topic, for which the student is trained by reading texts or listening to them.		
04XSZ4	Spanish for Beginners Z4	Z	2
The course is based on	course SZ3. It develops the student's vocabulary and extends the knowledge of the culture and social customs of the Spani	sh speaking coun	tries, mainly of
	to further grammar topics (perifrasis verbales, futuro imperfecto, direct object and indirect object pronouns, negative form of		-
	munication on a given general or subtechnical topic, for which the student is trained by reading texts or listening to them.		
		Z	2
04XSZ5	Spanish for Beginners Z5	I – I	1
	supplemented with additional subtechnical materials, so the students will be gradually acquainted with peculiarities of Spanisl	nor specific purp	uses. In its final
part, the general Spanis	sh course based on the course book will end with presentations and, finally, a written and oral examination.		

# List of courses of this pass:

Code	Name of the course	Completion	Credit
00EKOT	Economy in Technology The course introduces the basics of micro- and macroeconomics.	Z	1
00ETV	Ethics of Science and Technology	Z	1
00MAM1	Essentials of High School Course 1 Students are introduced to mathematical concepts and methods used in the introductory physics course.	Z	1
00MAM2	Essentials of High School Math Course 2 Review of basics of high school mathematics.	Z	1
00PT	Preparatory Week	Z	2
00RET	Rhetoric	Z	1
The course is foc	used on the acquisition of speech and voice techniques and on the rules of correct pronounciation. The course is also devoted to the nonverbal aspects. Stylistics exercises, strategies for coping with stage-fright and a short excursion into the history of rhetoric are ar	composition of put	olic speed
00UPRA	Introduction to Law	Z	1
00UPSY	Introduction to Psychology	Z	1
01MAT1	Mathematics 1	Z	4
he course is dev	oted to the study of the basics of calculus of one variable. It includes an introduction to differential and integral calculus, with particular practical problems.	ar emphasis on app	blications
01MAT2	Mathematics 2	Z	4
	ch is the continuation of Mathematics 1, is devoted to the integration techniques, improper Riemann integral, introduction to parameter coordinates), the basics of sequences and infinite series, and finally to the Taylor and power series and their applications		
01MAT3	Mathematics 3 The subject summarises the most important notions and theorems related to the study of finite-dimensional vector space		4
01MAT4 Linear and not	Mathematics 4 n-linear differential equations of the first order. Linear differential equations of higher order with constant coefficients. Multivariable ca	Z,ZK	4 cations.
01MATZ1	Mathematics, Examination 1	ZK	2
01MATZ2	Mathematics, Examination 2	ZK	2
01PRSTB			
t is a basic course efinition. The noti On th 02DEF1	Probability and Statistics B e of probability theory and mathematical statistics. The probability theory is build gradually beginning with the classical definition and ions as random variable, distribution function of random variable and characteristics of random variable are treated and basic limit the basis of this theory the basic methods of mathematical statistics such as estimation of distribution parameters and hypothesis test History of Physics 1	eorems are stated a ing are explained.	and prove
t is a basic course efinition. The noti On th 02DEF1 Physics and its pl	e of probability theory and mathematical statistics. The probability theory is build gradually beginning with the classical definition and ions as random variable, distribution function of random variable and characteristics of random variable are treated and basic limit the basis of this theory the basic methods of mathematical statistics such as estimation of distribution parameters and hypothesis test History of Physics 1 ace in the system of sciences. The relationship of man and nature. Natural sciences in ancient Orientand Greece, Greek natural phile Archimed. Arabic science, European science in Middle Ages. Renaissance - da Vinci, Giordano Bruno. Copernicus, Kepler, Galileo,	continuing till the k eorems are stated a ing are explained. Z osophers, Aristotle.	Kolmogoro and prove 2 Physics
t is a basic cours efinition. The noti On th 02DEF1 Physics and its pl Helenistic period,	e of probability theory and mathematical statistics. The probability theory is build gradually beginning with the classical definition and ions as random variable, distribution function of random variable and characteristics of random variable are treated and basic limit the basis of this theory the basic methods of mathematical statistics such as estimation of distribution parameters and hypothesis test History of Physics 1 ace in the system of sciences. The relationship of man and nature. Natural sciences in ancient Orientand Greece, Greek natural phile Archimed. Arabic science, European science in Middle Ages. Renaissance - da Vinci, Giordano Bruno. Copernicus, Kepler, Galileo, as experimental science. Newton and his work.	continuing till the k eorems are stated a ing are explained. Z osophers, Aristotle. Huygens. The birth	Kolmogoro and prove 2 Physics of physic
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04AKS	English Conversation	Z	1
	evelop the student's communication skills acquired throughout their previous studies. It aims to improve all aspects of oral communication		vill develop
	or various communication situations and will master their communication strategy. They will also practise their listening skills in order t		
in c	liscussions. The student will be trained to express their ideas clearly and according to current English usage, and become a more cor	fident speaker.	
04XAM1	English for Intermediate Students M1	Z	2
The course is desi	gned for students who have successfully completed the full secondary school English language course at least at the A2 level of the C	ommon European	Framework
	anguages (CEFR). It provides an introduction into English for Specific and Academic Purposes (ESP, EAP), i.e., into fundamentals of		
professional oral	and written communication situations. Thus it covers topics related to the student's life and needs as well as topics of subtechnical int	erest. Attention is a	also paid to
	extending the knowledge of grammar issues used in EAP.		
04XAM2	English for Intermediate Students M2	Z	2
	expects the student to have completed the AM1 course. It develops their skills for work with subtechnical texts, focusing also more or		
and lexical items ty	pical of ESP and EAP (e.g., definition, existence and classification of phenomena, object descriptions). Part of the course is also guided revision is included.	writing. If necessal	ry, grammar
04XAM3		Z	2
	English for Intermediate Students M3 ps the skills that enable students to cope with features typical of professional style. Increasing attention is paid to developing subtechnic	I I	
	f professional texts. Great emphasis is placed on distinguishing different levels of formal and informal oral and written communication	•	
-	purse also includes studying abstracts and rules for writing them as well as basic rules for preparing and giving a short presentation o		
	student's field.		
04XAMZK	English for Intermediate Students Examination	ZK	4
	ent is the examination as given by the study plan. The examination covers the AM1, AM2, and AM3 courses and consists of two parts	I I	
	30 min). The student is expected to master the AM syllabus and demonstrate the ability to apply their knowledge gained in the three I		,
04XAP1	English for Advanced Students P1	Z	2
	igned for students who have successfully completed the full secondary school English language course (at least the B1 level of the C	I I	
	Languages - CEFR). It provides an introduction into English for Specific and Academic Purposes (ESP, EAP), i.e., into the fundamen		
	le typical of professional oral and written communication situations (fundamentals of terms in mathematics and physics, definitions, g	-	
covers professiona	I oral and written communication on topics related to the undergraduate's life and needs. It develops skills for free professional writing (w	riting a CV, letter of	application,
	polite request). If necessary, revision of selected grammar topics is included.		
04XAP2	English for Advanced Students P2	Z	2
The AP2 course is	based on AP1, thus extending the student's skills for working with subtechnical texts, and even with professional texts of chosen bra	nches of science. A	According to
the students' need	Is it concentrates on chosen grammar topics, but mainly intends to develop understanding of syntactic structures and typical rhetorica	I functions (e.g., va	arious types
of descriptions, ar	nd, if possible, a case study). Increasing emphasis is placed on the undergraduate's independent work with and reading of linguistical	ly more demanding	g materials.
The course extend	s the student's subtechnical vocabulary, and includes fundamental notions of chosen branches of science. It is focused on formal writ	ing including the se	entence and
	paragraph structure, linking, cohesion and coherence in texts.		
04XAP3	English for Advanced Students P3	Z	2
The AP3 course is	based on AP2 and expects the student to work without any guidance with authentic professional materials and to interpret the text. It in	cludes training oral	and written
	ills and functions (e.g., expressing an opinion, agreement, and objections; taking part in discussion, note-taking; summarizing, writing		
also preparing a	project on a given or chosen topic and presenting it. The course places emphasis on distinguishing levels of formal and informal lang	uage both in oral a	nd written
		71/	
04XAPZK	English for Advanced Students Examination	ZK	4
	t is the examination as given by the study plan. The student is supposed to demonstrate mastering the AP3 syllabus and the ability to a		-
	courses. The examination consists of 2 parts - written (100 min) and oral (30 min) and includes also oral presentation of a topic from		-
04XCESM1	Czech for Foreigners - Intermediate 1		2
	sed on correct pronunciation, important morphological phenomena, prepositional phrases, and verb forms as well as on extending the s social situations.	ludent s vocabular	y ior various
		Z	2
04XCESM2	Czech for Foreigners - Intermediate 2 pps the topics covered in CESM1 and is then focused on more difficult grammar phenomena. It practices writing, speaking, and readir	- 1	2
	in understanding common abbreviations, abbreviated words, and mathematical terms and formulas.	iy skills and trains	
04YCESM2		Z	2
04XCESM3	Czech for Foreigners - Intermediate 3 revises morphological topics covered earlier and extends the student's knowledge of more difficult language phenomena. It is especia		
	lexises morphological topics covered earlier and extends the student's moviedge of more difficult language phenomena. It is especial lexicology and on developing the student's writing skills.	ally locused off styl	istics and
04XCESMZK	· · · · · · · · · · · · · · · · · · ·	ZK	4
	nt is the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of the CES		
	be taken after successful completion of the 3 courses. Detailed information is to be obtained from the teacher.	.,_,2 0001000 un	
04XCESP1	Czech for Foreign Students - Advanced 1	Z	2
	the course is very good knowledge of the Czech language, i.e., communicative competences at least at level B2 of the Common Europ	I I	
	/ on revision of standard language structures, but mainly on practising more complex grammatical structures typical of the style of sci		
	nal style of engineering and professional communication, both in spoken and written form. The topics include University Studies and S		-
	includes communication with teachers and faculty administrators.		
04XCESP2	Czech for Foreigners - Advanced 2	Z	2
	Is the student's knowledge acquired in CESP1 and focuses on difficult language phenomena. It practises working with technical and	specialist texts place	cing greater
	emphasis on individual work.		
04XCESP3	Czech for Foreigners - Advanced 3	Z	2
	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	Czech for Foreign Students - Advanced Examination	ZK	4
	nt is the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of the CES	I I	d can only
	be taken after successful completion of the 3 courses. Detailed information is to be obtained from the teacher.		
04XCESZ1	Czech for Foreigners - Beginners 1	Z	2
	gned for students of the English programme. Students will become acquainted with the main characteristics of Czech (phonetic and g	rammar features) a	
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.		

		1	1
04XCESZ2	Czech for Foreigners - Beginners 2	Z	2
The language and	communication competences acquired in CESZ1 are further developed. Students deepen their knowledge of the declension and cou	, njugation system	and practise
0 0	basic communication topics. The course covers roughly lessons 3-5 in Czech Express by L. Holá and P. Bo ilová.	, , ,	·
04100000		-	0
04XCESZ3	Czech for Foreigners - Beginners 3	Z	2
The course furthe	er develops the language and communication competences acquired in the XCESZ1 and XCESZ2 courses. The teaching focuses on	building up basic	vocabulary,
fixing correct pronu	unciation and deepening grammar, features through practice, as well as introducing the Czech culture. Students are asked to produce	simple texts and	they practise
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	eština expres
	One of the Exercise on Device strengther	71/	4
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 cours	ses 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
	ate FM The objective of this three-semester course is to improve and further develop communication in the French language in both v	-	1
	mmunicate 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, syste	emizes and expar	nds language
skills gained in prev	vious study. The following topics are covered: University studies in our country and in France, writing of transactional letters, CV, person	nal statement, rec	quest, answer
to an advert,	French culture and geography, Paris. Topics of specialization: mathematics, physics. Reading technical and popular science texts, we	ork based on thes	e texts.
04XFM2	French for Intermediate Students M2	7	2
	1 A Contraction of the second s	· · · · ·	1
	on FM1. Linguistic structures and competence acquired in previous study are systemized and expanded. Reading popular science tex		
and scientific lar	nguage (passives, nominalization, word formation). Topics: physics, power engineering, environment, Internet, success of French scie	nce and technolo	ogy, French
	scientists, artists and architects. Description of an object, device, shapes, dimensions, material.		
04XFM3	French for Intermediate Students M3	Z	2
	I contraction of the second	1	1
	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-cla		
field of students' fu	ture specialisation or to their interest and generally covers a technical /applied science topic. It is not a translation but a creative work	compiled from Fi	rench articles
and on	e's own knowledge/experienceLonger monologues on topics /situations set for the examination are prepared. Text structure, cohesi	ion and coherenc	e.
04XFMZK	French for Intermediate Students Examination	ZK	4
-		1	
The content is the	e examination as given by the study programme. The whole French programme is ended with an examination covering the contents o		examination
	consists of a written and oral part and is organized according to Examination Instructions, a document available on the well	b.	
04XFP1	French for Advanced Students P1	Z	2
FP advanced cour	'se The objective of this three-semester course is to improve and further develop communication in the French language in both writte	en and oral form.	Students will
	nicate in social interaction and in academic, scientific and work environment. They will be able to use the language to transmit general		
-	FP1 The course builds on and further develops linguistic competence acquired at secondary school. Difficult grammar topics are repe	-	-
	nparfait, pronouns. The following specific topics are covered: University studies in our country and in France, writing of transactional le	-	
request, answer to	an advert, environmental issues, success of French science and technology, chosen topics from French regional culture, Paris. Topics	of specialization.	mathematics
		or opeolanzation.	mathematics,
	internet, physics, chemistry. Reading of technical and popular science texts, further work with these texts and interpretation	-	mathematics,
04XFP2	internet, physics, chemistry. Reading of technical and popular science texts, further work with these texts and interpretation	n.	
04XFP2 With the link to P1	internet, physics, chemistry. Reading of technical and popular science texts, further work with these texts and interpretation French for Advanced Students P2	n. Z	2
	internet, physics, chemistry. Reading of technical and popular science texts, further work with these texts and interpretation French for Advanced Students P2 contents, the course further develops language skills. Focus is put on reading popular science texts and on oral communication on g	n. Z	2
With the link to P1	internet, physics, chemistry. Reading of technical and popular science texts, further work with these texts and interpretation French for Advanced Students P2 contents, the course further develops language skills. Focus is put on reading popular science texts and on oral communication on g technical and scientific communication are stressed (passive voice, nominalization, word formation).	n. Z iven topics. Featu	2 Ires typical of
	internet, physics, chemistry. Reading of technical and popular science texts, further work with these texts and interpretation French for Advanced Students P2 contents, the course further develops language skills. Focus is put on reading popular science texts and on oral communication on g	n. Z	2
With the link to P1 04XFP3	internet, physics, chemistry. Reading of technical and popular science texts, further work with these texts and interpretation French for Advanced Students P2 contents, the course further develops language skills. Focus is put on reading popular science texts and on oral communication on g technical and scientific communication are stressed (passive voice, nominalization, word formation).	n. Z iven topics. Featu	2 Ires typical of
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04XFZZK	French for Beginners Examination	ZK	3		
	examination as given by the study plan. The course is terminated with an examination consisting of oral and written part. The examination		-		
	Instruction for examination. Its content covers the levels FZ1 - FZ5.	·····,··,			
04XNM1	German for Intermediate Students M1	Z	2		
	e course is to level off the students' skills in the German language. The course focuses on revision of more difficult phenomena and sti	- 1			
-	processes (e.g. importance of verb prefixes). In the lexical part, it covers topics referring to higher education in both the Czech Repu				
	sues together with all necessary expressions and phrases, expressions and phrases needed to chemists, mathematicians, physicists,				
	terminology. It develops communication on related topics and is aimed at correct pronunciation, grammatical correctness and unders				
04XNM2	German for Intermediate Students M2	7	2		
	ces other more complex grammatical structures and their application in communication based on technical texts, such as the relation be	tween technology a	_		
	beginning of the 21st century, linguistically more demanding texts on the environment, the language of mathematics, computers and c		-		
	information and reading aloud, and appropriate language for various purposes in oral and written communication. The course systematic	0,			
J	phenomena important for professional discourse (participles, relative clauses).	,			
04XNM3	German for Intermediate Students M3	Z	2		
	ces other more complex grammatical structures and their application in communication based on technical texts, such as the relation be	- 1			
	beginning of the 21st century, linguistically more demanding texts on the environment, the language of mathematics, computers and c				
	information and reading aloud, and appropriate language for various purposes in oral and written communication. The course systematic				
	phenomena important for professional discourse (participles, relative clauses).	,			
04XNMZK	German for Intermediate Students Examination	ZK	4		
	t is the examination as given by the study plan. The whole German for Intermediate Students Course is completed by an examination c				
	ver the courses NM1 - NM3. The oral part follows after passing the written part successfully and after obtaining the 04NM3 assessme				
,	is to be obtained from the teacher.				
04XNP1	German for Advanced Students P1	7	2		
	res good grammar knowledge, extended general vocabulary, and good communication skills acquired at secondary school to be level	- 1			
	se is then focused on working with technical and scientific texts and practising reading techniques (skimming, scanning, reading for de	-	-		
	nar structures necessary for understanding a subtechnical text (passive voice, participles, participle structures) and it also focuses on prac				
Ū	i.e., telephoning.		,		
04XNP2	German for Advanced Students P2	Z	2		
	bs the students' skills in working with professional scientific texts (understanding, summarising, note-taking, interpreting) while extending	- 1	_		
	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, indir	-	,		
04XNP3	German for Advanced Students P3	7	2		
	sts of 3 main parts (general communicative situations, grammar and technical topics). Students will develop their vocabulary in a varie	tv of less common			
	nd car accidents, accident report, filling in a form, complaints). Based on presentations and technical and subtechnical texts, the voca	-			
	gineering, the environment, computer science, and car technology, will also be extended. Only authentic professional texts are used.				
	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.				
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 of		rts - written		
	cover 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.				
04XRM1	Russian for Intermediate Students M1	Z	2		
The course is desig	gned for students with previous knowledge of Russian from secondary schools. Students are supposed to know the Russian alphabet (	both printed and ha	andwritten),		
	or communication in everyday situations (introductions, socializing, greetings, shopping for food and objects of everyday need, asking t				
they can use ba	sic grammar structures (verbal and nominal forms, irregular verbs, pronouns). The initial knowledge corresponds to the achievement l	evel of the RZ2 cou	urse. The		
	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		
	, 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	1			
04XRM3	Russian for Intermediate Students M3	Z	2		
	ps 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	1			
	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				
	lents are eligible for the oral examination only after a prior pass in RM3 and a successful written examination. Students are given instr				
04XRP1	Russian for Advanced Students P1	Z	2		
	uirement for the course is to achieve the B1 CEFR level. The objective of the course is revision of standard language structures, practive of the course is revision of standard language structures.	- 1			
	structures, understanding the fundamentals of technical language and training writing skills.	and a second	grammar		
04XRP2	Russian for Advanced Students P2	Z	2		
	ed on RP1. It expands grammatical structures important for understanding technical texts (verbal adjectives, participles, passives, ve	1			
	structures). Stress is put on independent oral and written communication.		, syntaotio		
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	1			
	od previous knowledge of general language at secondary level (listening, reading, correct communication in everyday situations). The				
these skills. Further study is aimed at professional and technical skills (reading technical literature according to the students' specialization, oral and written interpretation). Students					
	is study is almed at professional and technical skills (reading technical metadule according to the students' specialization, oral and with inchnical vocabulary and practice quick and correct communication in professional situations. They will be able to both speak write accuracy	. ,			
	technical topics.				
04XRPZK	Russian for Advanced Students Examination	ZK	4		
	t is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowled				
	lents are eligible for the oral examination only after a prior pass in RP3 and a successful written examination. Students are given instr				
		,			

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	1. Thus it begins wit	h mastering	
the Russian alphabet (for both reading and writing skills) and fundamentals of grammar necessary for everyday communication (listening and speaking). Students will be able to read				
	a short text with marked stress, understand its contents and summarize it.			
04XRZ2	Russian for Beginners Z2	Z	2	
	ster of the programme is designed to teach skills for basic communication in everyday situations and for reading easy and short subte	echnical texts. Stud	lents will be	
able to communica	te using short sentences and appropriate structures, and read aloud with confidence a short text without marked stress. They will also	o develop their voc	abulary and	
	master further grammatical structures. They will have mastered with confidence the Russian alphabet and will be able to use it in	writing.		
04XRZ3	Russian for Beginners Z3	Z	2	
The course is base	d on RZ2 and includes further everyday topics, develops understanding of short compact texts on new subtechnical topics (for training	various forms of re	eading skills	
and listening) an	d introduces new grammar. Students will be trained to distinguish intonation patterns while listening to spoken language. They will be	able to respond so	o as to be	
	understood, and to express their opinion. Writing skills will be trained on guided writing tasks and note-taking.			
04XRZ4	Russian for Beginners Z4	Z	2	
The course is base	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 unfamiliar	
words, oral comm	nunication in everyday situations, writing longer texts). Students are trained to use grammar structures effectively (e.g., irregular verbs	s, differences in ver	b patterns	
from Czech, mo	dality, imperatives, conditionals). They practice and develop communication skills for everyday situations (food, travelling, free time), a	and practice oral ar	nd written	
communication c	n more specific topics (environment, addictions, the green movement). They become acquainted with various geographical data (e.g.	., Siberia), learn ho	ow to fill in	
	forms, look up the information from the timetable, learn about Russian holidays and typical meals.			
04XRZ5	Russian for Beginners Z5	Z	2	
The course expects	the student to have completed RZ4. It concentrates predominantly on reading skills (working with professional texts, i.e. understanding	ig, extracting and s	ummarizing	
information from a	specialized text) and speaking, and to a certain extent, writing about the professional information obtained by reading the texts. Comr	nunication skills ar	e trained on	
everyday topics. S	Studying grammar is based on professional and technical texts and only includes items typically used in professional communication (	(verbal adjectives,	participles,	
passiv	ve voice). Students develop their technical and economic vocabulary, and are also trained in some professional skills (writing a CV, po	olite request, etc.)		
04XRZZK	Russian for Beginners Examination	ZK	3	
	t is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowled			
- RZ5. Stud	ents are eligible for the oral examination only after a prior pass in RZ5 and a successful written examination. Students are given instr	uctions by the tead	cher.	
04XSM1	Spanish for Intermediate Students M1	Z	2	
The course is des	signed for students whose competence is at level B1 of CEFR, i.e. those who studied Spanish in the secondary school. The 3-semest	ter course develop	s standard	
vocabulary and p	ays attention to further grammar topics (e.g., perifrasis verbales, futuro imperfecto, direct object and indirect object pronouns, negativ	e form of the impe	rative, and	
subjunctive	), to written and oral communication on a given everyday or easy subtechnical topic, for which the students are trained by reading tex	kts or listening to th	iem.	
04XSM2	Spanish for Intermediate Students M3	Z	2	
The course develo	ps the students' knowledge from the previous course (SM1). Students are gradually acquainted with fundamentals of Spanish for sp	ecific purposes in	order to be	
	able to work with specialized texts on the Internet.			
04XSM3	Spanish for Intermediate Students M3	Z	2	
The course books a	are supplemented with additional subtechnical materials, so the students will be gradually acquainted with the peculiarities of academi	່ ic style. They will be	e 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 sho	rt articles and sum	maries. The	
	final part of the programme, general Spanish course based on course books, covers presentations and, finally, a written and oral ex	amination.		
04XSMZK	Spanish for Intermediate Students Examination	ZK	4	
The course content	is the examination as given by the study plan. SMZK examination consists of two parts - written and oral; to be eligible for the written parts	art, students will ha	ve obtained	
	non-graded assessment for course SM3.Oral examination follows the written part.			
04XSP1	Spanish for Advanced Students P1	Z	2	
Course concentrate	es on more difficult grammar topics, revision of vocabulary, basics of Spanish for specific purposes as well as written communication.	Course prerequisit	tes: level B2	
	of CEFR.			
04XSP2	Spanish for Advanced Students P2	Z	2	
Course SP2 is the	second part of the advanced Spanish course, extending Spanish for specific purposes topics. It comprises more grammar and synta	x and focuses on ir	ndependent	
	written communication.			
04XSP3	Spanish for Advanced Students P3	Z	2	
Course SP3 is the	final part of the advanced Spanish course. It is based on texts chosen by the students according to their future specialization. It is focu	used on written con	nmunication	
	based on what students will need in their career.			
04XSPZK	Spanish for Advanced Students Examination	ZK	4	
The course conten	is the examination as given by the study plan. Examination SPZK consists of two parts, namely oral and written. The prerequisite for a	admission to oral pa	art is having	
	passed the written test. Examination content is based on syllabi of courses SP1, SP2, and SP3 or on an individual study plan of the	e student.		
04XSZ1	Spanish for Beginners Z1	Z	2	
Course SZ1 is the	first stage of the five-semester programme of Spanish studies; during the first stage the students will master phonetics and fundament	tal grammar structu	ires and will	
be able to	communicate at an elementary level on topics of everyday life. They will acquire and extend fundamental vocabulary of general Span	ish and will develo	p it.	
04XSZ2	Spanish for Beginners Students Z2	Z	2	
Course SZ2 is base	ed on course SZ1, and expects students to develop and extend the knowledge and skills acquired so far. Grammar structures and lexis	will be chosen so	as to enable	
them to understand	d short adapted written texts and speech. Attention is also paid to cultural differences between Spanish-speaking countries and other	s such as the Czec	ch Republic.	
	Realia of Spanish-speaking countries are also included.			
04XSZ3	Spanish for Beginners Z3	Z	2	
The course is base	d on course SZ2, and develops the student's vocabulary and grammar structure. The course covers realia (history and culture) of the	e Spanish-speakin	g countries,	
mainly of Spain.	It pays attention to further grammar topics (pretérito perfecto, pretérito indefinido, pretérito imperfecto, the gerund and the imperative	). It includes writter	n and oral	
	communication on a given general topic, for which the student is trained by reading texts or listening to them.			
04XSZ4	Spanish for Beginners Z4	Z	2	
The course is bas	ed on course SZ3. It develops the student's vocabulary and extends the knowledge of the culture and social customs of the Spanish	speaking countries	s, mainly of	
Spain. It pays atte	ntion to further grammar topics (perifrasis verbales, futuro imperfecto, direct object and indirect object pronouns, negative form of the	imperative, and su	ubjunctive),	
	to written and oral communication on a given general or subtechnical topic, for which the student is trained by reading texts or listeni	ng to them.		
04XSZ5	Spanish for Beginners Z5	Z	2	
	are supplemented with additional subtechnical materials, so the students will be gradually acquainted with peculiarities of Spanish for	r specific purposes	s. In its final	
	part, the general Spanish course based on the course book will end with presentations and, finally, a written and oral examina	ition.		

04XSZZK	Spanish for Beginners Examination	ZK	3		
	ent is the examination as given by the study plan. Examination consists of two parts - written and oral. Student can register for oral ex	I I	-		
	passed the written examination test.				
12NMEA	Numerical Methods for Scientists and Engineers	KZ	3		
	the basic principles of numerical mathematics important for numerical solving of problems important for physics and technology. Me	I I			
important for physi	icists (ordinary differential equations, random numbers) are included in addition to the basic numerical methods. Integrated computat	ional environment	MATLAB is		
used as a	a demonstration tool. The seminars are held in computer laboratory and PASCAL is used as a principle programming language and N	IATLAB is also use	d.		
14TED	Creating Electronic Documents	Z	2		
Basic skills for crea	ting and presenting student theses. Individual exercises focus on creating and formatting texts, equations, charts, tables, presentatio	ns and entire docu			
	office suite.				
15ANAL1	Analytical Chemistry 1	Z	5		
Introduction, meth	nods of analytical chemistry, scheme of analytical procedures. Sampling and preparation of Hample. Precipitation reactions, solubility	product, factores i	nfluencing		
solubility. Gravim	etry. Statistical evaluation of results. Precipitation titrations, titration curve, endpoint indication. Complex-formation reactions, stability	constant, factors in	fluencing		
stability of complexe	es. Chelatometric titrations, titration curve, endpoint indication. Qualitative analysis of cations and anions, application of precipitation an	d complex-formation	on reactions		
for separation and	identification of ions. Acid-base reactions, acids, basis, acidity function, salts, hydrolysis of salts, buffers, acid-base indicators. Acid-base indicators.	ase titrations, titrat	ion curves,		
	detrmination of strong and weak acids, bases and salts. Acid-base reactions in nonaqueous solvents.				
15ANALY2	Analytical Chemistry 2	Z,ZK	5		
Analyt	ická chemie 2 navazuje na p edm t Analytická chemie 1. Kurz je zam en na instrumentální metody analytické chemie a zpracování	výsledk analýzy.			
15ANCH1		Z,ZK	5		
15ANCH2	Inorganic Chemistry 2	Z,ZK	5		
The first part of cou	urse is devoted to systematical chemistry of elements. The properties of representative elements, transition elements and chemistry of		pounds are		
characterised. Sele	cted chapters in the second part of course deal with catalysis, organometallic compounds and chemistry of solid state. The role of meta	l ions in biological e	environment		
	is discussed at the end of course.				
15ANP	Practical Training in Inorganic Chemistry	Z	4		
Basic practical co	urse dealing with synthesis and characterization of inorganic compounds. Students get practical training in syntheses of inorganic co	mpounds by acid-	base and		
	oxidation-reduction reactions, complex formation reactions and reactions in melt.				
15APLA	Laboratory Training in Analytical Chemistry	Z	4		
	atory exercises is oriented to qualitative analysis of cations and anions using wet chemistry procedures. Quantitative determination o	f analyte based up	on various		
	titration procedures follows. In the last part of exercises students become acquainted with basic instrumental methods of chemical	analysis.			
15BPCH1	Bachelor Thesis 1	Z	5		
	Background research and results of research	I I			
15BPCH2	Bachelor Thesis 2	Z	10		
	Background research and results of research	· – ·			
15CHEM	Analytical Calculations and Chemometry Principals	ZK	2		
	basic principles of chemometry including errors in classical and instrumental analysis, probability theory, propagation of errors, basi	I I			
	ince testing, hypothesis testing, least squares regression and correlation, calibration and fitting methods, non-parametric testing, ser				
°	on stoichiometry of redox, acid-base, complex and precipitation reactions, gravimetric stoichiometry. pH calculations, calculations in p		•		
_	spectrophotometry and separation methods, solving of complex forming equilibria.				
15DEIZ	Practical Exercises in Detection of Ionizing Radiation	KZ	3		
This laboratory exe	rcise is a practical introduction to fundamental principles of detection of ionizing radiation (IR), interaction of IR with matter, and functio	nality and settings	of particular		
	types of detectors and detection systems.				
15DIZ	Detection of Ionizing Radiation	ZK	2		
The first part of the	course deals with the definitions, properties, and application of the detectors of ionising radiation (IR). In the second part, a detailed	overview of the ga	s detectors,		
scintillation detect	tors, detectors for high energy IR, semiconductor detectors, and integrating solid state detectors is given. The last part of the course	reviews the princip	les of the		
	statistical treatment of data, and limits of detection.				
15EXK1	Excursion 1	Z	1		
	The excursion aims at mediating the students the acquaintance with various radiochemical and radiation methods used in practice of the students of the student	ctice.			
15FCHN1	Physical Chemistry 1	Z,ZK	5		
	rt is devoted to the recapitulation of the thermodynamic systems and thermodynamic properties of ideal and real gases. Next chapters	ı <i>'</i> I			
	rmodynamics and their applications. Last but not least, attention is devoted also to the thermodynamic, phase and chemical equilibriur				
	of nonequilibrium thermodynamics.				
15FCHN2	Physical Chemistry 2	Z,ZK	5		
	Chemistry 2 focuses on thermodynamics of solutions, particularly on electolytes. Basics of colloidal chemistry extend the theory of so				
15INSN1	Instrumental Methods 1	ZK	3		
	view of selected modern instrumental methods of research and analysis, theoretical fundamentals, instrumental technique, utilization	I I	-		
15JACH1	Nuclear Chemistry 1	Z,ZK	3		
	ory of nuclear chemistry and radiochemistry, nuclear entities, nuclear reactions, natural and artificial radioactivity. Kinetics of nuclear i	ı ' I			
	cay. Energetics of nuclear reactions, mass and energy balance of nuclei and energy of alpha, beta decay, gamma deexcitation in nuc				
15JACH2	Nuclear Chemistry 2	Z,ZK	4		
	s are discussed in detail in the course: Nuclear reactions yield, reaction cross section, excitation function. Fission reaction, spontaneo	I ' I			
	clear reaction, local temperature, atomic recoil and recoil energy, recoil of atom bound in a molecule, hot atom chemistry, retention, S		-		
15LABT	Practical Training in Laboratory Technique	Z	3		
	basic laboratory training and is designed for students of "Chemistry in Science", "Teaching of Chemistry", and "Biology". The course				
of the students gained at secondary school to an equal level and gets them ready for all following laboratory trainings. After absolving of the course, the students have the basic skills					
including handling the most frequently used laboratory equipments (pH-meter, UV-Vis spectrophotometer, vacuum rotary evaporator) and have the necessary information about safety					
rules as well as about writing laboratory diaries. The training is organized in blocks of four hours a week. The students work in groups of two according to a firm schedule so that each					
group absolve the complete set of (all) 10 exercises during semester. In the exercises, measurements of properties of unknown samples, basic synthetic and purification operations					
and basic methods of analyses are involved.					
15MZD	Measurement and Data Handling	Z,ZK	3		
	of statistical distribution functions (one-dimensional data), hypotesis testing, analysis of variance (ANOVA), correlation analysis, regre		nalysis of		
	multidimensional data; chemometrics; testing of analytical methods; numerical methods and computers in data processing	]			

15OCH	General Chemistry	Z,ZK	6
	y, classification of substances, concentrations, chemical reactions and equations, stoichiometric calculations, atoms and molecules,	I ' I	-
matter, chemical the	ermodynamics, first law of thermodynamics, thermochemistry, second law of thermodynamics, entropy, Gibbs energy, phase and chemi	cal equilibria, electi	rochemistry,
	pH, reaction kinetics, kinetic equation, Arrhenius' equation.		
15ORCA1	Organic chemistry 1	Z	2
-	ic compounds, properties of covalent bond, reactions on covalent bonds. Nomenclature of organic compounds (main chain, group, lo		
	of organic compounds, double bond isomers, chirality, enantiomers and diastereomeric compounds. Configuration and conformation, r A sidity, hard and soft acids and bases. Resonance, aromaticity, classification of substituents, reactivity of polycyclic arenes. Intermediat	-	
-	- electronic structure. Basic overview on alkanes and cycloalkanes, alkenes, arenes, halogenderivatives, organometallic compounds		
	compounds of sulfur, nitrogen, phosphorus, silicon, other elements and carbonyl compounds chemistry.		no, organic
15ORCA2	Organic chemistry 2	Z,ZK	6
	second group of organic compounds, carboxylic acids and their derivatives, heterocyclic compounds, important natural compounds,		-
	and pharmaceuticals - industrial and natural. Introduction to the metods of structural analysis.	Ū.	
15PINS	Laboratory Practice in Instrumental Methods	KZ	2
	Practical training of students in the use of selected modern instrumental methods and techniques for determination of required particular training of students in the use of selected modern instrumental methods and techniques for determination of required particular training of students in the use of selected modern instrumental methods and techniques for determination of required particular training of students in the use of selected modern instrumental methods and techniques for determination of required particular training of selected modern instrumental methods and techniques for determination of required particular training of selected modern instrumental methods and techniques for determination of techniques and techniques for determination of techniques and techniques and techniques for determination of techniques and techniques	rameters	
15POCHA	Organic Chemistry Practical	Z	4
	es of organic chemistry have the task to teach students the basics of laboratory techniques and methodology of work in the organic la		
chosen so that the	students are acquainted with basic chemical operations, and to obtain information on the preparation and properties of organic comp	pounds. Students t	hus have to
	supplement the theoretical knowledge from the lectures of organic chemistry.		
15POLE	Theory of Electromagnetic Field and Waves	Z,ZK	4
I ne course compris	ses of three parts: the first part contains selected passages of the theory of the electromagnetic field, the second part is dedicated to the	ne wave motion and	d the optics,
	and the third part is the introduction to the atomic physics.	Z	5
15PRFCH	Practical Exercises in Physical Chemistry nental physico-chemical phenomena are demonstrated in ten exercises. Basic thermodynamic, kinetic and electrochemical characteris	. – .	-
-	r capacity etc., are determinated. Required data are obtained by means of chemical analysis (e.g. titration, extraction) and by common	-	
	; polarography, potentiometry, conductometry, electrolysis, viscosimetry). Emphasis is given on appropriate interpretation of measure		
	and statistical evaluation.		
15RATEC	Practical Exercises in Radiochemical Techniques	KZ	2
The exercise is	s oriented on the training of students in laboratory praxis and work with open radioactive sources through basic lab operations such a	s pipetting, extract	ion and
chrom	atography techniques. Training is also focused on decontamination of surfaces and clean-up of the accident, work behind shielding a	nd in a glove box.	
15SBP	Bachelor Thesis Seminar	Z	1
	ne aim is to prepare students to write and defend bachelor thesis, including work with information sources and to acquire basic prese	ntation skills.	
15TOXA	Toxicology	ZK	2
	oxicology, containing general and special toxicology, toxicological data, legislation and basic aspects of chemical compounds handling	-	
-	sm, biodistribution and elimination has been described, as well as toxicological effects, evaluation of toxicity, indexes, and biological t	-	
selected group of	f organic compounds, inorganic compounds, natural compounds and warfare were described from toxicity behaviour. In legislation pa national regulation is described.	IRT REACH, Interna	tional and
15ZBCHA	Fundamentals of Biochemistry	ZK	2
	the whole field of a general biochemistry as well as basic biochemical pathways. The special attention is paid to make students under		
	processes essential for the life.		
16EPAM	Exact Methods in Research of Historic Monuments	ZK	2
	of historic monument investigations, methods of age determination (radiocarbon, thermoluminescence and related methods, further radiatio	1 1	
archaeomagnetis	sm), analytical methods for determination of origin and production technologies of artefacts (activation analysis, X-ray fluorescence a	nalysis and other r	nethods),
	photogrammetry.		
16ZBAF1	Fundamentals of Human Biology, Anatomy and Physiology 1	Z,ZK	4
-	ving systems, non-cellular and cellular organisms, prokaryotic and eukaryotic cell. Molecular and cell biology. Biopolymers. Molecular		
their regulation. G	eneral human anatomy. Basics of medical terminology. Overview of tissues. Skeleton. Muscle anatomy in general. Digestive system a	ind its physiology. F	Respiratory
	system and physiology of respiration. Excretory and genital tract.		
16ZBAF2	Fundamentals of Human Biology, Anatomy and Physiology 2	Z,ZK	4
	ogy of cardiac activity. General anatomy of blood vessels, main arteries of the body, overview of veins and physiology of blood, blood S. Visual system and physiology of the visual system. Auditory and vestibular system and physiology of hearing and balance. Skin, en	•	of nerves.
		<u> </u>	1
16ZDOZ1 History develor	Fundamentals of Radiation Dosimetry 1 pment, and objectives of dosimetry. Quantities and units used for description of sources, fields, interactions of ionizing radiation, ioniz	Z,ZK	4 sfer and
	absorption. Fundamentals of the effects of ionizing radiation.	allons, energy train	
17BPROV	Safe operation of nuclear facilities	KZ	2
	The aim of the subject is to familiarize students with basic principles of nuclear safety.		2
17JARE	Nuclear Reactors	ZK	2
	power issue. Previous evolution of power reactor. Nuclear fission reactors, fuel assemblies, active core, control systems, safety system		
of reactors into IV g	enerations. Standard types of nuclear power reactors: concept, description, layout, previous evolution, world share, perspectives. Pres	surized water reac	tors (PWR).
	PWR (Westinghouse, KWU, Framatom). VVER-type reactors, Temelín nuclear power plant. Boiling water reactors. Heavy water react		
° '	gas cooled reactors. Second nuclear era. reactors of generation III (EPR, AP-1000, VVER 1200). Reactors of generation IV: GIF and		Evaluation
	selection of proposed systems. Six selected concepts. ICRP scenarios of word evolution, hydrogen power, role of nuclear power in lo		
18ZALG	Basics of Algorithmization	Z,ZK	4
	devoted to selected algorithms and methods for algorithm design. This course intruduces selected methods for the determination of	_	
18ZPRO	Basics of Programming	Z	4 Duthon
i nis course is i	ntended mainly for students with little or no experience in programming. It familiarizes the students with the basic concepts in program	nining and with the	Python
T\/ 4	programming language.	7	4
TV-1	Physical Education	Z	1
TV-2	Physical Education	Z	1
TV-3	Physical education	Z	1
TV-4	Physical education	Z	1

For updated information see <u>http://bilakniha.cvut.cz/en/FF.html</u> Generated: day 2025-07-05, time 22:05.