Study plan

Name of study plan: BS Aplikace softwarového inženýrství

Faculty/Institute/Others: Department:
Branch of study guaranteed by the department: Welcome page
Garantor of the study branch:
Program of study: Applications of Natural Sciences
Type of study: Bachelor full-time
Required credits: 162
Elective courses credits: 18
Sum of credits in the plan: 180
Note on the plan:

Name of the block: Compulsory courses of the specialization Minimal number of credits of the block: 162 The role of the block: PO

Code of the group: BSASIPP1 Name of the group: BSASI - povinné p edm ty 1. ro ník Requirement credits in the group: In this group you have to gain at least 58 credits Requirement courses in the group: In this group you have to complete at least 15 courses Credits in the group: 58 Note on the group:

Note on the						
Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
02DEF1	History of Physics 1 Igor Jex, Miroslav Myška Miroslav Myška Igor Jex (Gar.)	Z	2	2+0	Z	PO
01LALB	Linear Algebra B 1, Examination Lubomíra Dvo áková	ZK	3	-		PO
01LAB2	Linear Algebra B2 Petr Ambrož	Z,ZK	4	1+2	L	PO
01LA1	Linear Algebra 1 Lubomíra Dvo áková	Z	1	2+1	Z	PO
01LAL	Linear Algebra 1 Petr Ambrož, Lubomíra Dvo áková Lubomíra Dvo áková Lubomíra Dvo áková (Gar.)	Z	2	2P+2C		PO
01LNA1	Linear Algebra 1 Lubomíra Dvo áková	Z	2	2+2		PO
01LAZ	Linear Algebra 1, Examination Lubomíra Dvo áková	ZK	2	-	Z	PO
01MANB	Calculus B 1, Examination Severin Pošta	ZK	4	-		PO
01MAB2	Calculus B2 Severin Pošta	Z,ZK	7	2+4	L	PO
01MAN	Calculus 1 Miroslav Kolá, Pavel Strachota, Edita Pelantová Pavel Strachota Edita Pelantová (Gar.)	Z	4	4+4		PO
01MA1	Calculus 1 Mat j Tušek	Z	4	4+4	Z	PO
01MAZ	Calculus 1, Examination Mat j Tušek	ZK	4	-	Z	PO
18EKO1	Mathematical Economics 1	Z,ZK	5	2+2	Z	PO
18EKO2	Mathematical Economics 2	Z,ZK	5	2+2	L	PO
18MIK1	Microeconomics 1 Quang Van Tran Quang Van Tran (Gar.)	Z,ZK	5	2P+2C	Z	PO
18MIK2	Microeconomics 2 Quang Van Tran Quang Van Tran (Gar.)	Z,ZK	5	2P+2C	L	PO
00PT	Preparatory Week Petr Ambrož, Milan Krbálek Petr Ambrož Petr Ambrož (Gar.)	Z	2	týden	Z	PO

18OS	Operating Systems Administration Vladimír Jarý Vladimír Jarý Vladimír Jarý (Gar.)	KZ	2	0+2	L	PO
18ZALG	Basics of Algorithmization Vladimír Jarý, Petr Pauš, František Vold ich, Miroslav Virius, František Gašpar, Zuzana Pet í ková Vladimír Jarý Miroslav Virius (Gar.)	Z,ZK	4	2+2	L	PO
18ZPRO	Basics of Programming Maksym Dreval, Vladimír Jarý, Petr Pauš, František Vold ich, Miroslav Virius, Zuzana Pet í ková, Jakub Klinkovský, Jan Tomsa Miroslav Virius Miroslav Virius (Gar.)	Z	4	4C	Z	PO

Characteristics of	the courses of this group of Study Plan: Code=BSASIPP1 Name=BSASI - povinné p edm	ty 1. ro ník	
02DEF1	History of Physics 1	Z	2
Physics and its place in	the system of sciences. The relationship of man and nature. Natural sciences in ancient Orientand Greece, Greek natural pl	hilosophers, Aristo	le. Physics in
Helenistic period, Archin	med. Arabic science, European science in Middle Ages. Renaissance - da Vinci, Giordano Bruno. Copernicus, Kepler, Galileo	o, Huygens. The bi	rth of physics
as experimental science	e. Newton and his work.		
01LALB	Linear Algebra B 1, Examination	ZK	3
01LAB2	Linear Algebra B2	Z,ZK	4
The subject summarizes	s the most important notions and theorems related to the matrix theory, to the study of vector spaces with a scalar product a	nd to the linear ge	ometry.
01LA1	Linear Algebra 1	Z	1
The subject summarizes	s the most important notions and theorems related to the study of vector spaces.	I I	
01LAL	Linear Algebra 1	Z	2
1. Vector space. 2. Linea	ar dependence and independence. 3. Basis and dimension. 4. Subspaces of vector spaces. 5. Linear mappings. 6. Matrices of	of linear mappings.	7. Frobenius
theorem.			
01LNA1	Linear Algebra 1	Z	2
The subject summarizes	s the most important notions and theorems related to the study of vector spaces.		
01LAZ	Linear Algebra 1, Examination	ZK	2
The content of this subj	ect is the exam in Linear Algebra 1.		
01MANB	Calculus B 1, Examination	ZK	4
Examination of knowled	Ige about stuff lectured in the 01MAN course.	· ·	
01MAB2	Calculus B2	Z,ZK	7
Basic calculus (real ana	lysis, indefinite and definite integrals and series).	· · ·	
01MAN	Calculus 1	Z	4
Basic calculus (real ana	lysis, functions of one real variable, differential calculus).	1 1	
01MA1	Calculus 1	Z	4
Basic course of real and	alysis (functions of one real variable, differential calculus).	I I	
01MAZ	Calculus 1, Examination	ZK	4
18EKO1	Mathematical Economics 1	Z,ZK	5
	selected models and methods for economic decision making. The main attention is given to optimization models of linear proc		ties of their real
applications and their so	olving by means of the current software products.		
18EKO2	Mathematical Economics 2	Z,ZK	5
The course introduces s	selected models and methods for economic decision making. The main attention is given to optimization models in graphs, p	roject managemen	t, inventory
management with deter	ministic and stochastic demand, queuing theory and simulation models.		
18MIK1	Microeconomics 1	Z,ZK	5
Microeconomics is a se	t of theories, which help us to understand processes by which the scarce resources are allocated among alternative uses. M	icroeconomics exp	lains the role of
•	nese processes, and makes more clear behaviour of the economic agents. This course of Microeconomics I consist of introduce	uction in Microecor	nomics and
Consumer Theory.			
18MIK2	Microeconomics 2	Z,ZK	5
	t of theories, helping us to understand process by which scarce resources are allocated among alternative uses. Microecono	-	le of prices and
	and make clear economic agents behaviour. The lectures of Microeconomics II are oriented on Theory of Firm and Industria	I Organisation.	
00PT	Preparatory Week	Z	2
18OS	Operating Systems Administration	KZ	2
Administration of operat	ting systems Windows and Linux. Users, rights, configuration, command line, networks, firewall		
18ZALG	Basics of Algorithmization	Z,ZK	4
This course is devoted t	to selected algorithms and methods for algorithm design. This course intruduces selected methods for the determination of the	ne algorithm comp	exity.
18ZPRO	Basics of Programming	Z	4
	mainly for students with little or no experience in programming. It familiarizes the students with the basic concepts in program	mming and with the	e Python
programming language.			

Code of the group: BSASIPP2

Name of the group: BSASI - povinné p edm ty 2. ro ník Requirement credits in the group: In this group you have to gain at least 54 credits Requirement courses in the group: In this group you have to complete at least 14 courses Credits in the group: 54 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
01DIM1	Discrete Mathematics 1 Lubomíra Dvo áková, Edita Pelantová, Zuzana Masáková Lubomíra Dvo áková Zuzana Masáková (Gar.)	Z	2	2P+0C	z	PO
01DIM2	Discrete Mathematics 2 Edita Pelantová, Zuzana Masáková Zuzana Masáková Zuzana Masáková (Gar.)	Z	2	2P+0C	L	PO
02FYZ1	Physics 1 Jaroslav Biel ík	Z,ZK	3	2+1	Z	PO
02FYZ2	Physics 2 Jaroslav Biel ík	Z,ZK	3	2+1	L	PO
01LIPB	Linear Programming B estmír Burdík	Z,ZK	4	2+2	Z	PO
18MAK1	Macroeconomics 1 Quang Van Tran Quang Van Tran (Gar.)	Z,ZK	4	2+2	L	PO
18MAK2	Macroeconomics 2 Quang Van Tran Quang Van Tran Quang Van Tran (Gar.)	Z,ZK	4	2+2	Z	PO
01MAB3	Calculus B3 Milan Krbálek Milan Krbálek Milan Krbálek (Gar.)	Z,ZK	7	2+4	Z	PO
01MAB4	Calculus B4 Ji í Mikyška, Miroslav Kolá, Milan Krbálek Milan Krbálek Milan Krbálek	Z,ZK	7	2+4	L	PO
18PPT	(Gar.) Advanced Programming Techniques	Z	3	0+2	L	PO
12PIN1	Practical Informatics for Technics 1 Milan Kucha ík, Richard Liska Milan Kucha ík Milan Kucha ík (Gar.)	Z	2	1+1	L	PO
18PRC1	Programming in C++ 1 Vladimír Jarý, Miroslav Virius Miroslav Virius (Gar.)	Z	4	2+2	Z	PO
18PRC2	Programming in C++ 2 Vladimír Jarý, Miroslav Virius, Jakub Klinkovský Miroslav Virius Miroslav Virius (Gar.)	KZ	4	2+2	L	PO
18MTL	Programming in MATLAB Jaromír Kukal	Z,ZK	5	2+2	Z	PO
18MPT	Programming in MATLAB Jaromír Kukal	KZ	5	0+4	Z	PO
Characteristics of the	courses of this group of Study Plan: Code=BSASIPP2 Name=	BSASI - povi	nné n ec	lm tv 2	ro ník	
01DIM1 Dis	crete Mathematics 1				Z	2
	ementary number theory and applications. It includes individual problem solving. crete Mathematics 2				Z	2
	currence relations. It includes individual problem solving. /sics 1			7	Z,ZK	3
	ations of mechanics, waves and thermodynamics ? basic level. The lecture is supplem	nented with praction	cal investiga		,	
	vsics 2			Z	Z,ZK	3
	and magnetism, modern physics. The lecture is supplemented with practical investiga	tion and demonst	ration of sel			
	ear Programming B exact mathematical formulation of simplex algorithm for the linear programming proble	em. In exact mathe	ematical lan	1	Z,ZK tudy primary ;	4 and dual
problem. As aplications, traffi	c problem, integer programming and example from the game theory are studied.					
	croeconomics 1				Z,ZK	4
	students with a fundamental theoretical basis for understanding how an economy work heory, fundamentals of open economy theory, inflation, unemployment, economic gro					-
	for economic policies. The learning outcomes of the course is to equip students with abil					
	m under the conditions of modern economic life.					-
18MAK2 Ma	n under the conditions of modern economic life. croeconomics 2				Z,ZK	4
18MAK2 Ma Macroeconomics II extends t	m under the conditions of modern economic life. croeconomics 2 heoretical knowledge acquired from Macroeconomics I of its students with the latest k	e		acroecono	nics. They are	models of
18MAK2 Ma Macroeconomics II extends t economic growth, especially	n under the conditions of modern economic life. croeconomics 2	hermore, it introd	uces studen	acroeconol its to moder	mics. They are n principles o	e models of f economic
18MAK2 Ma Macroeconomics II extends t economic growth, especially	m under the conditions of modern economic life. croeconomics 2 heoretical knowledge acquired from Macroeconomics I of its students with the latest k those with an emphasis on the role of human capital and technological progress. Furt	hermore, it introd	uces studen	acroeconol its to moder	mics. They are n principles o	e models of f economic
18MAK2 Ma Macroeconomics II extends t economic growth, especially modeling, i.e., macroeconom of labor market modeling. 01MAB3 Ca	m under the conditions of modern economic life. croeconomics 2 heoretical knowledge acquired from Macroeconomics I of its students with the latest k those with an emphasis on the role of human capital and technological progress. Furt ic models derived from microeconomic behavior of subjects and economics and their ra Iculus B3	hermore, it introductional expectation	uces studen s. It also pro	nacroeconor its to moder vides stude	mics. They are in principles o ints with mode 2,ZK	e models of f economic rn knowledge 7
18MAK2 Ma Macroeconomics II extends t economic growth, especially modeling, i.e., macroeconom of labor market modeling. 01MAB3 Ca The course is devoted to function Ca	m under the conditions of modern economic life. croeconomics 2 heoretical knowledge acquired from Macroeconomics I of its students with the latest k those with an emphasis on the role of human capital and technological progress. Furt ic models derived from microeconomic behavior of subjects and economics and their ra	hermore, it introductional expectation	uces studen s. It also pro	nacroeconor its to moder vides stude	mics. They are in principles o ints with mode 2,ZK	e models of f economic rn knowledge 7
18MAK2 Ma Macroeconomics II extends t economic growth, especially modeling, i.e., macroeconom of labor market modeling. 01MAB3 Ca The course is devoted to func- and prehilbert?s spaces.	m under the conditions of modern economic life. croeconomics 2 heoretical knowledge acquired from Macroeconomics I of its students with the latest k those with an emphasis on the role of human capital and technological progress. Furt ic models derived from microeconomic behavior of subjects and economics and their ra lculus B3 tional sequences and series, theory of ordinary differential equations, theory of quadra	hermore, it introductional expectation	uces studen s. It also pro	nacroeconor its to moder vides stude	nics. They are n principles o nts with mode Z,ZK	e models of f economic rn knowledge 7 aces, normed
18MAK2 Ma Macroeconomics II extends t economic growth, especially modeling, i.e., macroeconom of labor market modeling. 01MAB3 Ca The course is devoted to func and prehilbert?s spaces. 01MAB4 Ca	m under the conditions of modern economic life. croeconomics 2 heoretical knowledge acquired from Macroeconomics I of its students with the latest k those with an emphasis on the role of human capital and technological progress. Furt ic models derived from microeconomic behavior of subjects and economics and their ra lculus B3 tional sequences and series, theory of ordinary differential equations, theory of quadra lculus B4	hermore, it introdu tional expectation tic forms and surfa	uces studen s. It also pro aces, and ge	nacroeconor tits to moder vides stude eneral theor	nics. They are n principles o nts with mode 2,ZK y of metric spa 2,ZK	e models of f economic rn knowledge 7 aces, normed 7
18MAK2 Ma Macroeconomics II extends t economic growth, especially modeling, i.e., macroeconom of labor market modeling. 01MAB3 Ca The course is devoted to func and prehilbert?s spaces. 01MAB4 Ca The course is devoted proper	m under the conditions of modern economic life. croeconomics 2 heoretical knowledge acquired from Macroeconomics I of its students with the latest k those with an emphasis on the role of human capital and technological progress. Furt ic models derived from microeconomic behavior of subjects and economics and their ra lculus B3 tional sequences and series, theory of ordinary differential equations, theory of quadra lculus B4 tries of functions of several variables, differential and integral calculus. Furthermore, th	hermore, it introdu tional expectation tic forms and surfa	uces studen s. It also pro aces, and ge	nacroeconor tits to moder vides stude eneral theor	nics. They are n principles o nts with mode 2,ZK y of metric spi 2,ZK ue integral is :	e models of f economic rn knowledge 7 aces, normed 7 studied.
18MAK2 Ma Macroeconomics II extends t economic growth, especially modeling, i.e., macroeconom of labor market modeling. 01MAB3 Cal The course is devoted to funct and prehilbert?s spaces. 01MAB4 Cal The course is devoted prope 18PPT	m under the conditions of modern economic life. Croeconomics 2 heoretical knowledge acquired from Macroeconomics I of its students with the latest k those with an emphasis on the role of human capital and technological progress. Furt ic models derived from microeconomic behavior of subjects and economics and their ra Iculus B3 tional sequences and series, theory of ordinary differential equations, theory of quadra Iculus B4 rties of functions of several variables, differential and integral calculus. Furthermore, the vanced Programming Techniques	hermore, it introdu tional expectation tic forms and surfa	uces studen s. It also pro aces, and ge	nacroeconor tits to moder vides stude eneral theor	mics. They are n principles o nts with mode Z,ZK y of metric spa Z,ZK ue integral is Z	e models of f economic rn knowledge 7 aces, normed 7 studied. 3
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18MAK2 Ma Macroeconomics II extends t economic growth, especially modeling, i.e., macroeconom of labor market modeling. 01MAB3 Cal The course is devoted to funct and prehilbert?s spaces. 01MAB4 Cal The course is devoted prope 18PPT Adv 12PIN1 Pratom Computer and operating system File system, file atributes, wo load a process priorities. State	m under the conditions of modern economic life. Croeconomics 2 heoretical knowledge acquired from Macroeconomics I of its students with the latest k those with an emphasis on the role of human capital and technological progress. Furt ic models derived from microeconomic behavior of subjects and economics and their ra- lculus B3 tional sequences and series, theory of ordinary differential equations, theory of quadra lculus B4 rties of functions of several variables, differential and integral calculus. Furthermore, the vanced Programming Techniques actical Informatics for Technics 1 tems. Personal computer, workstation and supercomputers. Processor, memory, bus, on s. Requirements on operating system for research and technical computing. Operating sy- rking with files. Text editors: vi, emacs. Command interpreter (shell) sh, csh and its pro- indard tools. Graphical user interface X-windows. Computer networks. Local computer	hermore, it introdi tional expectation tic forms and surfa- ne measure theor devices, hard disk ystem UNIX. Basio gramming (scripts networks. Global	uces studen s. It also pro aces, and ge y and theory c, network in c principles,). Controlling	acroeconol its to moder vides stude eneral theor v of Lebesg terface. Hat kernel, kern g processes	mics. They are n principles o nts with mode Z,ZK y of metric spa Z,ZK ue integral is Z dware and sc el services. Do s, process stat	e models of f economic rn knowledge 7 aces, normec 7 studied. 3 2 oftware. ocumentation us, computer
18MAK2 Ma Macroeconomics II extends t economic growth, especially modeling, i.e., macroeconom of labor market modeling. 01MAB3 Cal The course is devoted to func and prehilbert?s spaces. 01MAB4 Cal The course is devoted prope 18PPT Adr 12PIN1 Pra Computer and operating system File system, file atributes, wo load a process priorities. Stat protocols TCP/IP. Network com	m under the conditions of modern economic life. Croeconomics 2 heoretical knowledge acquired from Macroeconomics I of its students with the latest k those with an emphasis on the role of human capital and technological progress. Furt ic models derived from microeconomic behavior of subjects and economics and their ra- lculus B3 tional sequences and series, theory of ordinary differential equations, theory of quadra lculus B4 rties of functions of several variables, differential and integral calculus. Furthermore, the vanced Programming Techniques actical Informatics for Technics 1 tems. Personal computer, workstation and supercomputers. Processor, memory, bus, on s. Requirements on operating system for research and technical computing. Operating syrking with files. Text editors: vi, emacs. Command interpreter (shell) sh, csh and its pro- restrict of several variables. Variables is the technical computing. The terms of the technical computing of the technical computing. The terms of the technical computing. The terms of the technical computing of the technical computing of the technical computing. The terms of the technical computing. The terms of the technical computing of the technical computing. The terms of the technical computing. The terms of the technical computing of the technical computing of the technical computing. The terms of the technical computing. The terms of the technical computing of the technical computing of the technical computing. The terms of the technical computing of the technical computing of the technical computing of technical computing of the technical computing of technical computing of the technical computing of technical computi	hermore, it introdi tional expectation tic forms and surfa- ne measure theor devices, hard disk ystem UNIX. Basio gramming (scripts networks. Global	uces studen s. It also pro aces, and ge y and theory c, network in c principles,). Controlling	acroeconol its to moder vides stude eneral theor v of Lebesg terface. Hat kernel, kern g processes	mics. They are n principles o nts with mode Z,ZK y of metric spa Z,ZK ue integral is Z dware and sc el services. Do s, process stat	e models of f economic rn knowledge 7 aces, normec 7 studied. 3 2 oftware. ocumentation us, computer

18PRC2	Programming in C++ 2	KZ	4
This course covers	ne object oriented programming and othesr advanced constructs in the C+;+ programming language and the Standard Template	e Library.	•
18MTL	Programming in MATLAB	Z,ZK	5
Introducing Matlab	nvironment as efficient tool for computation in complex arrays and symbolic variables, namely for linear algebra, mathematic an	alysis, statistics, a	algorithmization
and geometric repre-	sentation of results.		
18MPT	Programming in MATLAB	KZ	5
-	Programming in MATLAB Is students with various programming techniques in the Matlab environment. The emphasis is placed on the differences in progr		5 logy in Matlab

Code of the group: BSASIPP3 Name of the group: BSASI - povinné p edm ty 3. ro ník Requirement credits in the group: In this group you have to gain at least 50 credits Requirement courses in the group: In this group you have to complete at least 12 courses Credits in the group: 50 Note on the group: Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their Completion Credits Code Scope Semester Role members) Tutors, authors and guarantors (gar.) **Bachelor Thesis 1** 18BPSE1 Ζ 5 Ζ 0+5 PO Milan Kucha ík, Radek Fu ík, Dana Majerová Milan Kucha ík Milan Kucha ík

	(Gar.)					
18BPSE2	Bachelor Thesis 2 Milan Kucha ík, Radek Fu ík, Dana Majerová Milan Kucha ík Milan Kucha ík (Gar.)	Z	10	0+10	L	PO
18EKONS	Econometrics	Z,ZK	5	2+2	L	PO
12NME1	Numerical Methods 1 Pavel Váchal Pavel Váchal (Gar.)	Z,ZK	4	2+2	L	PO
18PST	Probability and Statistics	Z,ZK	5	3+1	Z	PO
18PJ	Programming in Java Miroslav Virius Miroslav Virius Miroslav Virius (Gar.)	Z,ZK	5	2P+2C	Z	PO
18WEB	Markup Languages for WWW	KZ	3	0+2	Z	PO
18SBAK	Bachelor Seminar Miroslav Virius, Milan Kucha ík, Jaromír Kukal Milan Kucha ík Milan Kucha ík (Gar.)	Z	2	0+2	L	PO
01TKOB	Theory of Codes Edita Pelantová, Jan Volec Edita Pelantová Jan Volec (Gar.)	ZK	2	2+0	L	PO
18INTA	Development of internet applications Jakub Klinkovský, Dana Majerová Dana Majerová (Gar.)	KZ	4	2P+2C	L	PO
18ZNEK	Knowledge Economics	KZ	3	2+0	Z	PO
12ZDP	Data Processing for Publishing Antonín Novotný Antonín Novotný Antonín Novotný (Gar.)	Z	2	2	Z	PO

Characteristics of the courses of this group of Study Plan: Code=BSASIPP3 Name=BSASI - povinné p edm ty 3. ro ník

18BPSE1	Bachelor Thesis 1	Z	5							
The bachelor project is I	The bachelor project is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the project supervisor during common									
regular meetings and di	scussions.									
18BPSE2	Bachelor Thesis 2	Z	10							
The bachelor project is I	, assed on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the	, project superviso	during common							
regular meetings and di	scussions.									
18EKONS	Econometrics	Z,ZK	5							
Econometrics is based	on economic theory and the relations between economic quantities are expressed by mathematical tools and observed data	from economic re	ality. The course							
covers basic instrument	s of econometric analysis as the basic econometric model, the generalized model and the system of simultaneous equations	s and instruments	for econometric							
model verification.										
12NME1	Numerical Methods 1	Z,ZK	4							
There are explained the	basic principles of numerical mathematics important for numerical solving of problems important for physics and technology.	Methods for solut	tion of tasks very							
	(ordinary differential equations, random numbers) are included in addition to the basic numerical methods. Integrated compu	itational environm	ent MATLAB is							
used as a principle prog	gramming language as a demonstration tool. The seminars are held in computer laboratory.									
18PST	Probability and Statistics	Z,ZK	5							
The course of Probabilit	y and Statistics introduces basic theory of probability and statistic theory for bachelor?s students of SOFE. Upon successful	completion of this	course students							
will be able to apply intr	oduced theory to their bachelor's thesis and econometric courses, as well as to advanced study of applied statistics, econom	netrics and time-s	eries theory.							
18PJ	Programming in Java	Z,ZK	5							
This course is devoted t	to the Java platform and to the development of the basic types of applications for this platform.									
18WEB	Markup Languages for WWW	KZ	3							
The lectures cover mark	up languages used in the www environment. It's focused on standards and recommendations of formats descriptions of www	w. The lectures al:	so offer practical							
touch of all interesting p	parts.									
18SBAK	Bachelor Seminar	Z	2							
Seminar devoted to pre	paration of the bachelor's thesis and the presentation of the result. Students present their running results.		•							
01TKOB	Theory of Codes	ZK	2							
Algebraic methods used	d in error detecting and error correcting codes.		1							

	Development of intermet and lighting				1/7	4
18INTA The lectures provide an	Development of internet applications overview of modern technologies for the development of web applications. Students will I	earn basic web lar	nguages and	 d concepts (KZ HTML, URL, et	4 c.) and they
	o relational database systems. The tutorials are dedicated to practical examples of buildin			implest to m	ore advanced.	The course
	ards backend technologies and using the Python languages, but covers also frontend fra	meworks and Java	Script.		1/7	
18ZNEK Knowledge Economy is	Knowledge Economics concerned with problems of education and human capital related to economics.				KZ	3
12ZDP	Data Processing for Publishing				Z	2
	omputer-assisted publishing, coding of text, OCR (optical code recognition), DTP (desk to					
HTML, XML,, publishir multimedial presentation	ng into www pages, cloud computing,commonly used graphical formats, formatting of typi	ical data (PDF, PS,	DOC, DOC	X, PPS, PP	SX, RFT, XLS,	XLSX),
Name of the bl	ock: Compulsory elective courses					
Minimal number	er of credits of the block: 0					
The role of the	block: PV					
Code of the ar	oup: BSSPOLVEDY					
-	roup: BS - Social Sciences					
•	credits in the group:					
	courses in the group: In this group you have to comp	lata at laas	t 1 cou	rea		
		1010 01 1003		130		
Credits in the g		irees is oblig	atory			
Note on the gr	Name of the course / Name of the group of courses		atory.	[<u> </u>	
Code	(in case of groups of courses the list of codes of their members)	Completion	Credits	Scope	Semester	Role
	Tutors, authors and guarantors (gar.)					
00EKOT	Economy in Technology Jana Ková ová	Z	1	2+0		PV
00ETV	Ethics of Science and Technology Jakub Hají ek Jana Ková ová	Z	1	0+2	L	PV
00RET	Rhetoric Jana Ková ová Jana Ková ová	Z	1	0+2		PV
00UPRA	Introduction to Law Martin ech Jana Ková ová	Z	1	0+2		PV
00UPSY	Introduction to Psychology Jakub Hají ek Jana Ková ová	Z	1	0+2		PV
Characteristics of	the courses of this group of Study Plan: Code=BSSPOLVEDY Na	me=BS - Soc	ial Scien	ces		
00EKOT	Economy in Technology				Z	1
	he basics of micro- and macroeconomics.					
00ETV	Ethics of Science and Technology				Z	1
00RET	Rhetoric n the acquisition of speech and voice techniques and on the rules of correct pronounciati	on The course is a	also devoted	to the com	Z	1 ic speech
	al aspects. Stylistics exercises, strategies for coping with stage-fright and a short excursion					-
00UPRA	Introduction to Law				Z	1
00UPSY	Introduction to Psychology				Z	1
•	oup: BSJAZYKY					
Name of the g	roup: BS - languages					
Requirement c	redits in the group:					
Requirement c	ourses in the group: In this group you have to comp	lete at leas	t 2 cou	rses		
Credits in the g	group: 0					
Note on the gr						
	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, authors and guarantors (gar.)					
04AMZK	English for Intermediate Students Examination Jana Ková ová, Slav na Brownová, Hana ápová Jana Ková ová Hana	ZK	4		Z	PV
04APZK	ápová (Gar.) English for Advanced Students Examination Slav na Brownová, Darren Copeland	ZK	5		Z	PV
04CESMZK	Czech for Intermediate Students Examination Jana Ková ová Jana Ková ová	ZK	4		Z	PV
04CESPZK	Czech for Foreign Students - Advanced Examination Jana Ková ová	ZK	5		Z	PV
04FMZK	French for Intermediate Students Examination V ra Šlechtová V ra Šlechtová (Gar.)	ZK	4		Z	PV
L			1	1	l	

04FPZK	French for Intermediate Students Examination V ra Šlechtová V ra Šlechtová (Gar.)	ZK	5		Z	PV
04FZZK	V ra Siechtova V ra Siechtova (Gal.) French for Beginners Examination V ra Šlechtová V ra Šlechtová (Gar.)	ZK	3		L	PV
04NMZK	German for Intermediate Students Examination Miloslava echová Miloslava echová Gar.)	ZK	4		Z	PV
04NPZK	German for Advanced Students Examination Miloslava echová Miloslava echová Miloslava echová (Gar.)	ZK	5		Z	PV
04RMZK	Russian for Intermediate Students Examination Zhanna Isaeva Jana Ková ová Zhanna Isaeva (Gar.)	ZK	4		Z	PV
04RPZK	Russian for Intermediate Students Examination Zhanna Isaeva Zhanna Isaeva (Gar.)	ZK	5		Z	PV
04RZZK	Russian for Beginners Examination Zhanna Isaeva Miloslava echová Zhanna Isaeva (Gar.)	ZK	3		L	PV
04SMZK	Spanish for Intermediate Students Examination Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)	ZK	4		Z	PV
04SPZK	Spanish for Advanced Students Examination Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)	ZK	5		Z	PV
04SZZK	Spanish for Beginners Examination Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)	ZK	3		L	PV
	ne courses of this group of Study Plan: Code=BSJAZYKY Name	=BS - langua	ges		ZK	4
•	English for Intermediate Students Examination examination as given by the study plan. The examination covers the 04AM1, 04AM2, and	d 04AM3 courses	and consists	1		•
,	ent is expected to master the AM syllabus and demonstrate the ability to apply their know	wledge gained in	the three Engl			
The course content is the	English for Advanced Students Examination examination as given by the study plan. The student is supposed to demonstrate master P courses. The examination consists of 2 parts - written (110 min) and oral (30 min) and i			ability to a		-
study.						
	Czech for Intermediate Students Examination examination as given by the study plan. The examination consisting of a written and oral		a taniaa of tha	-	ZK	4
	completion of the 3 courses. Detailed information is to be obtained from the teacher.	part covers all the	e topics of the	040ESIVI1	,2,3 courses	and can only
	Czech for Foreign Students - Advanced Examination				ZK	5
	examination as given by the study plan. The examination consisting of a written and oral	part covers all th	e topics of the	1	1	-
be taken after successful	completion of the 3 courses. Detailed information is to be obtained from the teacher.					
-	rench for Intermediate Students Examination			1	ZK	4
	ation as given by the study programme. The whole French programme is ended with an e		ring the conte	nts of FM1	-FM3. The ex	kamination
I	ral part and is organized according to Examination Instructions, a document available or	n the web.			71/	
	rench for Intermediate Students Examination n is ended with an examination covering the contents of FP1-FP3. The examination cons	sists of a written a	nd/or an oral i		ZK	5 coording to
	a document available on the web. Assessment of the presentation is included into the ex			part and is	organized at	
04FZZK	rench for Beginners Examination				ZK	3
1	ation as given by the study plan. The course is terminated with an examination consisting	g of oral and writt	en part. The e	1		
Instruction for examination	h. Its content covers the levels FZ1 - FZ5.					
1	German for Intermediate Students Examination				ZK	4
	examination as given by the study plan. The whole German for Intermediate Students Cou ourses 04NM1 - 04NM3. The oral part follows after passing the written part successfully a teacher.		-			
	German for Advanced Students Examination				ZK	5
	examination as given by the study plan. The whole German for Advanced Students Cour	rse is completed I	ov an examina			-
	courses 04NM1 - 04NM3. The oral part follows after passing the written part successfully				e 1	
information is to be obtain	ed from the teacher.					
1	Russian for Intermediate Students Examination examination as given by the study plan. The course is completed by taking a written and	oral examination	testing the kn	1	ZK nd skills acq	4 uired in RM1
	le for the oral examination only after a prior pass in RM3 and a successful written examin		-	-	-	
04RPZK F	Russian for Intermediate Students Examination				ZK	5
	examination as given by the study plan. The course is completed by taking a written and					uired in RP1
	e for the oral examination only after a prior pass in RP3 and a successful written examin	ation. Students a	re given instru			
1	Russian for Beginners Examination examination as given by the study plan. The course is completed by taking a written and	oral examination	testing the kn	1	ZK nd skills acqi	3 uired in RZ1
	e for the oral examination only after a prior pass in RZ5 and a successful written examin	ation. Students a	re given instru	ctions by th	ne teacher.	
	Spanish for Intermediate Students Examination			1	ZK	4
	examination as given by the study plan. 04SMZK examination consists of two parts - wri	tten and oral; to b	e eligible for t	he written	part, students	s will have
-	ssment for course 04SM3.Oral examination follows the written part.				ZK	5
U+0FZA 3	Spanish for Advanced Students Examination examination as given by the study plan. Examination 04SPZK consists of two parts, name	nely oral and writt	en The prerer			
1		iony orai and will		AMONG IOL C		orar part is
The course content is the		-	n of the stude	nt.		
The course content is the having passed the written	test. Examination content is based on syllabi of courses SP1, SP2, and SP3 or on an inc	-	n of the stude		ZK	3
The course content is the having passed the written 04SZZK		dividual study pla			ZK tion only if he	3 e/she has

Name of the block: Elective courses

Code of the group: BSVOLPREDM Name of the group: BS - volitelné p edm ty Requirement credits in the group: Requirement courses in the group: Credits in the group: 0 Note on the group:

Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their Code Completion Credits Semester Scope Role members) Tutors, authors and guarantors (gar.) Administration of UNIX System 12AUX ΚZ 2 2+0L V Milan Ši or **Milan Ši or** Milan[®] Ši or (Gar.) Algebra Pavel Š oví ek 01ALG ZK 4 4+0 Ζ v Algebra 01ALGE 6 Z,ZK 4+1 v Zuzana Masáková Zuzana Masáková Zuzana Masáková (Gar.) Linear Circuit Analysis Ζ 11ANEL Z,ZK 4 4 V Pavel Jiroušek Pavel Jiroušek Pavel Jiroušek (Gar.) **Analytical Calculations and Chemometry Principals** 15CHEM ΖK 2 2+0Ζ V Ji í Zima Ji í Zima Ji í Zima (Gar.) **English - State Examination** 04ABZK 5 L 7K 2 v Jana Ková ová English for Intermediate Students M1 04AM1 Ζ 1 Ζ 0+2 V Jana Ková ová **English for Intermediate Students M2** 04AM2 7 1 0+2 L V Jana Ková ová **English for Intermediate Students M3** Ζ 04AM3 Ζ 1 0+2 v Jana Ková ová Hana ápová (Gar.) 7 Ζ 04AP1 **English for Advanced Students P1** 1 0+2v 04AP2 Ζ 1 L **English for Advanced Students P2** 0+2 v 04AP3 Ζ Ζ 1 0+2 v **English for Advanced Students P3** Application of Ionizing Radiation in Analytical Methods 16APLB ΖK 5 L 4+0V Tomáš echák Application of Lasers 12APL Z,ZK 2 Ζ Helena Jelínková, Alexandr Jan árek Helena Jelínková Helena Jelínková 2+0V (Gar.) Applications of Group Theory in Solid State Physics Zden k Pot ek Zden k Pot ek Zden k Pot ek (Gar.) 11APLG ZK 2 2 Ζ V Atomic and Molecular Spectroscopy 02AMS Z,ZK 4 Ζ 2+2v Svatopluk Civiš Svatopluk Civiš Svatopluk Civiš (Gar.) Czech for foreigners - Intermediate Ζ 1 Ζ 04CESM1 0+2 v Jana Ková ová **Intermediate Czech 2** 04CESM2 Ζ 1 0+2 L V Jana Ková ová **Intermediate Czech 3** Ζ Ζ 04CESM3 1 0+2v Jana Ková ová Jana Ková ová (Gar.) Czech for Foreign Students - Advanced Examination 04CESP1 Ζ Ζ 1 0+2v Jana Ková ová Czech for Foreigners - Advanced 04CESP2 Ζ 1 L 0+2 v Jana Ková ová **Czech for Foreigners - Advanced** 04CESP3 Ζ 1 Ζ 0+2V Jana Ková ová History of Alchemy and Chemistry Vladimír Karpenko Vladimír Karpenko Vladimír Karpenko (Gar.) 15DALCH ΖK 2 2+0Ζ V **History of Physics 1** 7 2 7 02DEF1 2+0V Igor Jex, Miroslav Myška Miroslav Myška Igor Jex (Gar.) **History of Physics 2** 02DEF2 Ζ 2 L 2+0V Igor Jex Miroslav Myška Igor Jex (Gar.) **History of Mathematics** Ζ 1 01DEM 0+2 L v Lubomíra Dvo áková Lubomíra Dvo áková Lubomíra Dvo áková (Gar.) **Differential Equations, Symmetries and Groups** 02DRG Ζ 4 2+2 Ζ V Libor Šnobl Libor Šnobl (Gar.) **Discrete Mathematics 1** 01DIM1 Ζ 2 2P+0C Ζ v Lubomíra Dvo áková, Edita Pelantová, Zuzana Masáková Lubomíra Dvo áková Zuzana Masáková (Gar.) **Discrete Mathematics 2** 01DIM2 Ζ 2 2P+0C L V Edita Pelantová, Zuzana Masáková Zuzana Masáková Zuzana Masáková (Gar.)

01DIM3	Discrete Mathematics 3 Lubomíra Dvo áková	Z	2	2+0	Z	V
00EKOT	Economy in Technology Jana Ková ová	Z	1	2+0		V
11ELEA	Instrumentation and Measurement Pavel Jiroušek Pavel Jiroušek Pavel Jiroušek (Gar.)	Z,ZK	2	2	L	v
14ELMI	Electron Microscopy	Z,ZK	3	2+0		V
18ESPG1	European Computer Driving Licence 1	Z	2	0+2	Z	V
18ESPG2	European Computer Driving Licence 2 Jaromír Kukal	Z	2	0+2	L	V
16EPAM	Exact Methods in Research of Historic Monuments Ladislav Musílek Ladislav Musílek Ladislav Musílek (Gar.)	ZK	2	2+0	Z	V
02EXF1	Experimental Physics 1 Jan epila	Z	2	2+0	L	V
02EXF2	Experimental Physics 2	ZK	2	2+0	Z	V
17ENF	Experimental Neutron Physics Jan Rataj	KZ	2	2+1	L	V
04FM1	French for Intermediate Students M1	Z	1	0+2	Z	V
04FM2	French for Intermediate Students M2 V ra Šlechtová	Z	1	0+2	L	V
04FM3	French for Intermediate Students M3 V ra Šlechtová (Gar.)	Z	1	0+2	Z	V
04FP1	French for Advanced Students P1 Michal Beneš	Z	1	0+2	Z	V
04FP2	French for Advanced Students P2 V ra Šlechtová	Z	1	0+2	L	V
04FP3	French for Advanded Students P3 V ra Šlechtová (Gar.)	Z	1	0+2	Z	V
04FZ1	French for Beginners Z1 V ra Šlechtová	Z	1	0+4	L	V
04FZ2	French for Beginners Z2 Michal Beneš	Z	1	0+4	Z	V
04FZ3	French for Beginners Z3 V ra Šlechtová	Z	1	0+4	L	V
04FZ4	French for Beginners Z4 V ra Šlechtová (Gar.)	Z	1	0+4	Z	V
04FZ5	French for Beginners Z5 V ra Šlechtová V ra Šlechtová (Gar.)	Z	1	0+4	L	V
01FKP	Functions of Complex Variable Severin Pošta, Pavel Š oví ek Pavel Š oví ek (Gar.)	ZK	2	2+0	Z	V
01FKPB	Functions of Complex Variable B Pavel Š oví ek	Z	2	2+0	Z	V
01FAN1	Functional Analysis 1 Pavel Š oví ek Pavel Š oví ek (Gar.)	Z,ZK	4	2+2		V
01FA1	Functional Analysis 1 Pavel Š oví ek	Z,ZK	3	2+1	z	v
01FA2	Functional Analysis 2 Pavel Š oví ek Pavel Š oví ek (Gar.)	Z,ZK	4	2+2	L	V
02PRA1	Experimental Laboratory 1 Libor Škoda, Katarína K ížková Gajdošová, Barbara Antonina Trzeciak, Jaroslav Biel ík Jaroslav Biel ík Jaroslav Biel ík (Gar.)	KZ	6	0+4	z	V
02PRA2	Experimental Laboratory 2 Libor Škoda, Jaroslav Biel ík Jaroslav Biel ík (Gar.)	KZ	6	0+4	L	V
02FYS1	Physical Seminar 1 Vojt ch Svoboda (Gar.)	Z	2	0+2	Z	V
02FYS2	Physical Seminar 2 Jan epila	Z	2	0+2	L	V
01GTDR	Geometric Theory of Ordinary Differential Equations Michal Beneš Michal Beneš Michal Beneš (Gar.)	Z	2	0+2	Z	V
12INS1	Information Systems 1	Z,ZK	2	2	Z	V
12INS2	Information Systems 2 Antonín Novotný	Z,ZK	2	2	L	V
16ZJTB	Nuclear Energy Facilities and Accelerators Kamil Augsten, Tomáš echák Kamil Augsten Tomáš echák (Gar.)	ZK	2	2+0	Z	V
17JARE	Nuclear Reactors Tomáš Bílý Tomáš Bílý Tomáš Bílý (Gar.)	ZK	2	2	L	V
01JEPR	Simple Compilers Zden k ulík Zden k ulík (Gar.)	Z	2	2	L	V
	Zden k ulik Zden k ulik Zden k ulik (Gar.)					
16KPR	Clinical Propaedeutic Jana Votrubová Jana Votrubová Jana Votrubová (Gar.)	ZK	2	2+0	Z	V

02KF	Quantum Physics	Z,ZK	3	2P+1C	Z	v
02LCF1	Filip Petrásek Libor Šnobl (Gar.) Experimental Laboratory 1	Z	2	0+2	Z	V
02LCF2	Jaroslav Biel ík Jaroslav Biel ík (Gar.) Experimental Laboratory 2	Z	2	0+2	L	v
	Jaroslav Biel ík Jaroslav Biel ík (Gar.) Laser Technique 1					-
12LT1	Václav Kube ek Václav Kube ek Václav Kube ek (Gar.)	Z,ZK	3	2+1	Z	V
12LT2	Laser Technique 2 Helena Jelínková	Z,ZK	2	2+0	L	V
12LAS	Laser Systems Václav Kube ek Václav Kube ek (Gar.)	Z,ZK	3	2+1	L	V
01LIP	Linear Programming Jan Volec estmír Burdík Jan Volec (Gar.)	Z,ZK	3	2+1	Z	V
18MAK1	Macroeconomics 1 Quang Van Tran Quang Van Tran Quang Van Tran (Gar.)	Z,ZK	4	2+2	L	V
18MAK2	Macroeconomics 2 Quang Van Tran Quang Van Tran Quang Van Tran (Gar.)	Z,ZK	4	2+2	Z	V
01MAPR	Markov processes	Z,ZK	4	2+2		v
18EKO1	Jan Vybíral Jan Vybíral Jan Vybíral (Gar.) Mathematical Economics 1	Z,ZK	5	2+2	Z	v
18EKO2	Mathematical Economics 2	Z,ZK	5	2+2	L	V
01MASC	Mathematical Statistics - Seminar Tomáš Hobza Tomáš Hobza (Gar.)	Z	2	0+2		v
00MAM1	Essentials of High School Course 1	Z	1	0+1		V
00MAM2	David B e Essentials of High School Math Course 2 Lukáš Heriban Severin Pošta Lukáš Heriban (Gar.)	Z	1	0+1		V
01MMPV	Mathematical Models of Groundwater Flow	KZ	2	2+0	L	V
01MMF	Ji í Mikyška Ji í Mikyška Ji í Mikyška (Gar.) Methods of Mathematical Physics	Z,ZK	6	4+2	L	V
 18MIK1	Pavel Š oví ek Microeconomics 1	Z,ZK	5	2P+2C	Z	V
18MIK2	Quang Van Tran Quang Van Tran (Gar.) Microeconomics 2	Z,ZK	5	2P+2C	L	v
11MIK	Quang Van Tran Quang Van Tran (Gar.) Logical Circuits and Microprocessors	Z,ZK	4	4		v
	Pavel Jiroušek, Petr Levinský Pavel Jiroušek Pavel Jiroušek (Gar.) Microprocessors 1	,	-	-	_	-
12MPR1	Miroslav ech Miroslav ech Miroslav ech (Gar.)	ZK	4	4+0	Z	V
12MPR2	Microprocessors 2 Miroslav ech Miroslav ech (Gar.)	ZK	2	2+0	L	V
12MOF	Molecular Physics Jan Proška, Martin Michl Martin Michl Jan Proška (Gar.)	ZK	2	2+0	L	V
12NT	Nanotechnology Jan Proška, Eduard Hulicius Jan Proška Eduard Hulicius (Gar.)	ZK	2	2+0	Z	V
02NSAD	Simulations and Data Analysis Tools	Z	2	2+0		V
04NM1	German for Intermediate Students M1	Z	1	0+2	Z	V
04NM2	German for Intermediate Students M2 Miloslava echová Miloslava echová (Gar.)	Z	1	0+2	L	v
04NM3	German for Intermediate Students M2 Miloslava echová Miloslava echová (Gar.)	Z	1	0+2	Z	v
04NP1	German for Advanced Students P1	Z	1	0+2	Z	V
04NP2	German for Advanced Students P2 Miloslava echová	Z	1	0+2	L	V
04NP3	German for Advanced Students P3 Miloslava echová Miloslava echová (Gar.)	Z	1	0+2	Z	V
01NME2	Numerical Methods 2 Michal Beneš Michal Beneš (Gar.)	KZ	2	2+0	L	V
15CH1	Michail Benes Michail Benes Michail Benes General Chemistry 1 Ond ej Holas, Petr Distler, Václav uba Petr Distler Petr Distler (Gar.)	Z	3	2+1	Z	V
15CH2	General Chemistry 2	Z,ZK	3	2+1	L	V
02OR	Ond ej Holas, Petr Distler, Václav uba Petr Distler Petr Distler (Gar.) General Relativity	ZK	3	3+0	L	V
01POPJ1	Old ich Semerák Boris Tomášik Boris Tomášik (Gar.) Computers and Natural Language 1	Z	2	0+2	Z	v
01POPJ2	Computers and Natural Language 1	Z	2	0+2	L	V
12POAL	Computer Algebra	KZ	2	2	Z	V
01POGR1	Richard Liska Richard Liska Richard Liska (Gar.) Computer Graphics 1	Z	2	2	Z	v
	Pavel Strachota Pavel Strachota Pavel Strachota (Gar.)	<u>ک</u>	2	2	۷	v

01POGR2	Computer Graphics 2 Pavel Strachota Pavel Strachota (Gar.)	Z	2	2	L	v
01SITE1	Computer Networks 1 Miroslav Minárik Miroslav Minárik (Gar.)	Z	2	1+1	Z	v
01SITE2	Computer Networks 2 Miroslav Minárik Miroslav Minárik (Gar.)	Z	2	1+1	L	v
01POPR	Advanced Probability Tomáš Hobza	Z	2	2+0		v
12PIN1	Practical Informatics for Technics 1 Milan Kucha ík, Richard Liska Milan Kucha ík Milan Kucha ík (Gar.)	Z	2	1+1	L	v
12PIN2	Practical Informatics for Technics 2 Milan Ši or Milan Ši or Milan Ši or (Gar.)	Z	2	1+1	Z	v
12PIN3	Practical Informatics for Technics 3	Z	2	1+1	L	v
15INPR	Milan Ši or Milan Ši or Milan Ši or (Gar.) Laboratory Practice in Instrumental Methods	KZ	4	0+4	L	V
01PRA1	Probability and Mathematical Statistics 1	Z,ZK	6	4+2	Z	V
01PRA2	Probability and Mathematical Statistics 2	ZK	2	2+0	L	V
01PRST	Probability and Statistics Tomáš Hobza Tomáš Hobza Tomáš Hobza (Gar.)	Z,ZK	4	3+1	Z	V
01PRSTB	Probability and Statistics B	KZ	4	3+1	Z	V
16UAZB	Tomáš Hobza Tomáš Hobza Tomáš Hobza (Gar.) Principles of Ionizing-Radiation Applications	ZK	2	2+0	Z	v
16FNZB	Ladislav Musílek Kamil Augsten Ladislav Musílek (Gar.) Problems of Non-ionizing Radiation	ZK	2	2+0	Z	v
12PSEM	Problem Seminary	Z	2	0+4	L	v
01PERI	Programming of Peripherals Devices Zden k ulík Zden k ulík (Gar.)	Z	2	2+0	Z	V
01PW	Windows Programming	Z	2	2+0	Z	v
18PRC1	Zden k ulík Zden k ulík Zden k ulík (Gar.) Programming in C++ 1	Z	4	2+2	Z	v
18PRC2	Vladimír Jarý, Miroslav Virius Miroslav Virius Miroslav Virius (Gar.) Programming in C++ 2 Vladimír Jarý, Miroslav Virius, Jakub Klinkovský Miroslav Virius Miroslav	KZ	4	2+2	L	v
18PJ	Virius (Gar.) Programming in Java Miroslav Virius Miroslav Virius (Gar.)	Z,ZK	5	2P+2C	Z	V
18MTL	Programming in MATLAB	Z,ZK	5	2+2	Z	v
18MPT	Jarōmír Kukal Programming in MATLAB	KZ	5	0+4	Z	v
18PAS	Jaromír Kukal Pascal Programming	Z	4	2+2	L	v
12PDR1	Miroslav Virius Data Communication and Interfaces 1	Z	2	2+0	Z	v
12PDR2	Data Communication and Interfaces 2 Josef Blažej	Z	2	2+0	L	v
01PSL	LaTeX - Publication Instrument	Z	2	0+2	L	V
00RET	Petr Ambrož Petr Ambrož Petr Ambrož (Gar.) Rhetoric	Z	1	0+2		v
01RMF	Jana Ková ová Jana Ková ová The Equations of Mathematical Physics	Z,ZK	6	4+2	Z	v
02RQGP1	Václav Klika Václav Klika Václav Klika (Gar.) Seminar on Quark-Gluon Plasma 1	_, Z	1	2+0		v
02RQGP2	Jaroslav Biel ík Seminar on Quark-Gluon Plasma 2	z	1	2+0		v
04RM1	Jaroslav Biel ík Russian for Intermediate Students M1	Z	1	0+2	Z	v
04RM2	Michal Beneš Russian for Intermediate Students M2	Z	1	0+2	L	-
	Miloslava echová Russian for Intermediate Students M3				_	V
04RM3	Zhanna Isaeva (Gar.) Russian for Advanced Students P1	Z	1	0+2	Z	V
04RP1	Michal Beneš	Z	1	0+2	Z	V
04RP2	Russian for Advanced Students P2 Miloslava echová	Z	1	0+2	L	V
04RP3	Russian for Advanced Students P3 Zhanna Isaeva (Gar.)	Z	1	0+2	Z	V
04RZ1	Russian for Beginners Z1 Miloslava echová	Z	1	0+4	L	V
04RZ2	Russian for Beginners Z2 Michal Beneš	Z	1	0+4	Z	v

04RZ3	Russian for Beginners Z3	Z	1	0+4	L	v
04RZ4	Miloslava echová Russian for Beginners Z4		1	0+4		v
	Zhanna Isaeva (Gar.) Russian for Beginners Z5					-
04RZ5	Zhanna Isaeva Zhanna Isaeva (Gar.)	Z	1	0+4		V
01RSWP	Project Management of Software Projects Seminar of Mathematical Physics	KZ	2	0+2	Z	V
02SMF	Ladislav Hlavatý (Gar.)	Z	2	0+2	Z	V
01SSM1	Seminar of Contemporary Mathematics 1 Mat j Tušek Edita Pelantová (Gar.)	Z	2	0+2	Z	V
01SSM2	Seminar of Contemporary Mathematics 2 Václav Klika	Z	2	0+2	L	V
16SED1	Dosimetry Seminar 1 Kate ina Pila ová Kate ina Pila ová (Gar.)	Z	2	0+2		V
16SED2	Dosimetry Seminar 2 Kate ina Pila ová	Z	2	0+2		V
01SMB1	Seminar on Calculus B1 Milan Krbálek	Z	2	0+2	Z	v
01SMB2	Seminar on Calculus B2 Milan Krbálek	Z	2	0+2	L	v
01SOS1	Software Seminar 1	Z	2	0+2	Z	v
	Zden k ulík Zden k ulík Zden k ulík (Gar.) Software Seminar 2		-			-
01SOS2	Zden k ulík Zden k ulík Zden k ulík (Gar.)	Z	2	0+2	L	V
02SPRA1	Special Practicum 1 Lukáš Novotný, Jan epila Jan epila (Gar.)	KZ	6	0+4	Z	V
02SPRA2	Special Practicum 2 Jan epila Jan epila Jan epila (Gar.)	KZ	6	0+4	L	V
01STR	Statistical Decision Theory Václav K s Václav K s Václav K s (Gar.)	ZK	2	2+0	L	v
11SFBM	Structure and Function of Biomolecules Petr Kolenko, Tomáš Kova Petr Kolenko Petr Kolenko (Gar.)	Z,ZK	3	2+1	Z	v
04SM1	Spanish for Intermediate Students M1	Z	1	0+2	Z	V
04SM2	Spanish for Intermediate Students M3 Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)	Z	1	0+2	L	V
04SM3	Spanish for Intermediate Students M3 Beatriz Vadillo Gonzalo (Gar.)	Z	1	0+2	Z	V
04SP1	Spanish for Advanced Students P1	Z	1	0+2	Z	V
04SP2	Spanish for Advanced Students P2	Z	1	0+2	L	V
04SP3	Spanish for Advanced Students P3 Beatriz Vadillo Gonzalo (Gar.)	Z	1	0+2	Z	V
04SZ1	Spanish for Beginners Z1	Z	1	0+4	L	V
04SZ2	Spanish for Beginners Students Z2	Z	1	0+4	Z	V
04SZ3	Spanish for Beginners Z3 Beatriz Vadillo Gonzalo (Gar.)	Z	1	0+4	L	V
04SZ4	Spanish for Beginners Z3 Beatriz Vadillo Gonzalo (Gar.)	Z	1	0+4	Z	v
04SZ5	Spanish for Beginners Z5	Z	1	0+4	L	v
14TM	Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.) Engineering Mechanics	Z,ZK	4	2+2	3	V
14TEM	Ji í Kunz, Aleš Materna Ji í Kunz Ji í Kunz (Gar.) Engineering Mechanics	Z,ZK	6	4	5	v
12TAIS	Ji í Kunz Ji í Kunz Ji í Kunz (Gar.) Ion Beam Techniques and Applications.	Z,ZK	3	3+0	L	V V
TV-1	· · · · ·	Z	1	3+0	Z	V
TV-2	Physical Education Physical Education	Z	1		 L	V
TV-3	Physical Education Physical education	Z	1	0+2	Z	V
TV-4	Physical education Physical education	Z	1	0+2	L	V
02TEF1	Theoretical Physics 1	Z,ZK	4	2+2	Z	V
02TEF2	Petr Novotný Petr Novotný Igor Jex (Gar.) Theoretical Physics 2	Z,ZK	4	2+2	L	V
01DYSY	Filip Petr Åsek, Petr Novotný Josef Schmidt Petr Novotný (Gar.) Theory of Dynamic Systems	ZK	3	3+0		v
	Branislav Rehák Branislav Rehák Branislav Rehák (Gar.) Theory of Codes					
01TKO	Edita Pelantová, Jan Volec Edita Pelantová Jan Volec (Gar.) Heat and Molecular Physics	ZK	2	2P+0C	L	V
02TER	Filip Petrásek Petr Novotný Petr Jizba (Gar.)	Z,ZK	4	2+2	L	V
02TSFA	Igor Jex, Jaroslav Novotný Antonín Hoskovec Igor Jex (Gar.)	Z,ZK	4	2+2	L	V

01TOP	Topology estmír Burdík estmír Burdík estmír Burdík (Gar.)	ZK	2	2+0	Z	V
16MCRB	Transport of Ionizing Radiation and Monte Carlo Method	Z,ZK	4	2+2	L	v
18INTA	Development of internet applications Jakub Klinkovský, Dana Majerová Dana Majerová Dana Majerová (Gar.)	KZ	4	2P+2C	L	V
01DYK	Introduction to Continuum Dynamics Pavel Strachota	Z	2	0+2		V
16ZIVB	Introduction to Ecology Hana Pr šová Hana Pr šová (Gar.)	KZ	2	2+0	Z	v
02UFEC	Introduction to Elementary Particle Physics Jaroslav Biel ik. Marek Matas Jaroslav Biel ik Jaroslav Biel ik (Gar.)	Z	2	2+0	Z	V
11UFPLN	Introduction to Solid State Physics Petr Kolenko, Ivo Kraus Petr Kolenko Ivo Kraus (Gar.)	ZK	2	2+0	L	V
17UINZ	Introduction to Engineering	Z,ZK	3	2+1	Z	V
02UKP	Introduction to Curves and Surfaces	Z	2	1+1	L	V
12ULT	Introduction to Laser Technique	Z,ZK	3	2+1	Z	V
12UMF	Introduction to Modern Physics Jan Pšikal Jan Pšikal Jan Pšikal (Gar.)	Z	3	2+1	L	V
18UOA	Introduction into Object Oriented Architecture Rudolf Pecinovský Rudolf Pecinovský	Z,ZK	4	2P+2C	Z	V
00UPRA	Introduction to Law Martin ech Jana Ková ová	Z	1	0+2		V
00UPSY	Introduction to Psychology Jakub Hají ek Jana Ková ová	Z	1	0+2		V
01UTIZ	Introduction to Theoretical Informatics Petr Ambrož	ZK	2	2+0		V
11UVOD	Introduction to Specialization	Z	2	0+2	Z	V
12VAK	Vacuum Physics and Technology Richard Švejkar Richard Švejkar (Gar.)	KZ	4	2+2	Z	V
12PYTH	Scientific Programming in Python Pavel Váchal, Jakub Urban Pavel Váchal Pavel Váchal (Gar.)	Z	2	0+2	L	V
12VTV	Scientific and Technical Computing Ivan Procházka Ivan Procházka (Gar.)	Z	2	1+1	L	V
12VFT	High Frequency and Impulse Circuitry Jaroslav Pavel Jaroslav Pavel (Gar.)	Z,ZK	2	2+0	L	V
17VYR	Research Reactors	ZK	2	2	L	V
12EPR1	Basic Electronics Practicum 1 Ivan Procházka, Jaroslav Pavel Ivan Procházka Ivan Procházka (Gar.)	KZ	3	0+2	Z	V
12EPR2	Basic Electronics Practicum 2 Ivan Procházka, Jaroslav Pavel Ivan Procházka Ivan Procházka (Gar.)	KZ	3	0+2	L	V
12ZPLT	Basic Laser Technique Laboratory Václav Kube ek, Josef Blažej Josef Blažej Václav Kube ek (Gar.)	KZ	6	0+4	L	V
12ZPOP	Basic Optical Laboratory Alexandr Jan árek Alexandr Jan árek Alexandr Jan árek (Gar.)	KZ	6	0+4	L	V
18ZALG	Basics of Algorithmization Vladimír Jarý, Petr Pauš, František Vold ich, Miroslav Virius, František Gašpar, Zuzana Pet í ková Vladimír Jarý Miroslav Virius (Gar.)	Z,ZK	4	2+2	L	V
16AMMB	Fundamentals of Analytical Measurement Methods Hana Pr šová Hana Pr šová (Gar.)	ZK	2	2+0	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
16ZBAF2	Fundamentals of Human Biology, Anatomy and Physiology 2 Alena Doubková, Šimon Vaculín, Josef Stingl Alena Doubková Alena Doubková (Gar.)	Z,ZK	4	2+2	L	V
16ZDOZ1	Fundamentals of Radiation Dosimetry 1 Tomáš Trojek Tomáš Trojek Tomáš Trojek (Gar.)	Z,ZK	4	2+2		V
16ZDOZ2	Fundamentals of Radiation Dosimetry 2 Tomáš Trojek Tomáš Trojek Tomáš Trojek (Gar.)	ZK	2	2+0	L	v
17ZEH	Basics of Economic Assessment	ZK	2	2+0	Z	V
17ZEL	Basics of Electronics Martin Kropík Martin Kropík (Gar.)	KZ	3	2+2	Z	V
12ZEL1	Basic Electronics 1 Jaroslav Pavel Jaroslav Pavel (Gar.)	Z,ZK	3	2+1	Z	V
12ZEL2	Basic Electronics 2 Jaroslav Pavel Jaroslav Pavel (Gar.)	Z,ZK	3	2+1	L	V
02ZFM1	Foundations of Physical Measurements 1 Jan epila	Z	2	2+0	Z	V
02ZFM2	Foundations of Physical Measurements 2	Z	2	0+2	L	v

11ZFPL	Basic to Solid State Physics Ladislav Kalvoda, Eva Mihóková Eva Mihóková Ladislav Kalvoda (Gar.)	KZ	2	26P+0C	Z	V
12ZFP	Principles of Plasma Physics Martin Jirka, Ji í Limpouch Martin Jirka Ji í Limpouch (Gar.)	Z,ZK	4	3+1	L	v
02ZJF	Nuclear Physics Vladimír Wagner Vladimír Wagner (Gar.)	Z,ZK	6	3+2	Z	V
02ZJFB	Nuclear Physics B Vladimír Wagner Vladimír Wagner (Gar.)	KZ	3	3+0	Z	V
15ZKJE	Nuclear Power Plants Design and Operation Tomáš Bílý, Lenka Frýbortová, ubomír Sklenka Lenka Frýbortová Tomáš Bílý (Gar.)	ZK	3	2+0	L	V
16MEZB	Fundamentals of Ionizing-Radiation Metrology Tomáš echák	Z,ZK	4	2+1	Z	V
01ZOS	Introduction to Operating Systems Zden k ulík Zden k ulík Zden k ulík (Gar.)	Z	2	2+0	L	V
12ZAOP	Fundamentals of Optics Ivan Richter, Pavel Kwiecien Ivan Richter Ivan Richter (Gar.)	Z,ZK	2	2+0	Z	V
01ZPB1	Introduction to Computer Security 1 Petr Voká Petr Voká Petr Voká (Gar.)	Z	2	1+1		V
16ZPSP	Basic Work with PC Kamil Augsten Kamil Augsten (Gar.)	Z	2	0+2	1	V
18ZPRO	Basics of Programming Maksym Dreval, Vladimír Jarý, Petr Pauš, František Vold ich, Miroslav Virius, Zuzana Pet í ková, Jakub Klinkovský, Jan Tomsa Miroslav Virius Miroslav Virius (Gar.)	Z	4	4C	Z	v
16ZRAO	Basics of Radiation Protection Aneta Dušková Aneta Dušková (Gar.)	Z	2	2+0		V
02ZSM	Introduction to the Standard Model Zden k Hubá ek Zden k Hubá ek (Gar.)	ZK	2	2+0		V
16ZEDB	Basics of Experimantal Data Processing Kate ina Pila ová Kate ina Pila ová (Gar.)	ZK	2	2+0	Z	V
14ZZKS	Testing and Processing of Metals and Alloys	KZ	4	4	6	V
12ZDP	Data Processing for Publishing Antonín Novotný Antonín Novotný Antonín Novotný (Gar.)	Z	2	2	Z	V
haracteristics of t	the courses of this group of Study Plan: Code=BSVOLPREDM Nar	ne=BS - vol	itelné n	edm tv		
1	History of Physics 1				7	2
	he system of sciences. The relationship of man and nature. Natural sciences in ancient Ori	entand Greece.	Greek nat	1	- 1	_
,	ed. Arabic science, European science in Middle Ages. Renaissance - da Vinci, Giordano B					
as experimental science.	Newton and his work.					
18EKO1	Mathematical Economics 1			Z	,ZK	5
The course introduces se	elected models and methods for economic decision making. The main attention is given to c	ptimization mod	els of linea	ar programmin	g, possibilitie	es of their re
applications and their sol	ving by means of the current software products.					
18EKO2	Mathematical Economics 2			Z	,ZK	5
The course introduces se	elected models and methods for economic decision making. The main attention is given to	optimization mod	dels in grap	ohs, project ma	anagement,	inventory
nanagement with determ	ninistic and stochastic demand, queuing theory and simulation models.					
nanagement with detern	initiate and electrication actuality, quoting interfy and circulation interaction					

•					
18MIK1	Microeconomics 1	Z,ZK	5		
Microeconomics is a set of theories, which help us to understand processes by which the scarce resources are allocated among alternative uses. Microeconomics explains the role of					
prices and markets in th	prices and markets in these processes, and makes more clear behaviour of the economic agents. This course of Microeconomics I consist of introduction in Microeconomics and				
Consumer Theory.					
18MIK2	Microeconomics 2	Z,ZK	5		
A 41					

18MIK2	Microeconomics 2	Z,ZK	5		
Microeconomics is a se	t of theories, helping us to understand process by which scarce resources are allocated among alternative uses. Microeconor	mics explain the r	ole of prices and		
markets in this process and make clear economic agents behaviour. The lectures of Microeconomics II are oriented on Theory of Firm and Industrial Organisation.					
18ZALG	Basics of Algorithmization	Z,ZK	4		
This course is devoted	to selected algorithms and methods for algorithm design. This course intruduces selected methods for the determination of th	e algorithm comp	olexity.		
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					
01DIM1	Discrete Mathematics 1	Z	2		
The seminar is devoted	to elementary number theory and applications. It includes individual problem solving.				
01DIM2	Discrete Mathematics 2	Z	2		
The seminar is devoted	to recurrence relations. It includes individual problem solving.				
18MAK1	Macroeconomics 1	Z,ZK	4		
Macroeconomics I prov	ides students with a fundamental theoretical basis for understanding how an economy works. It introduces main macroecono	mic indicators, m	oney market,		
macroeconomic equilib	rium theory, fundamentals of open economy theory, inflation, unemployment, economic growth, economic fluctuations, basic	macroeconomic r	nodels of IS-LM,		
AS-AD and their implica	tions for economic policies. The learning outcomes of the course is to equip students with ability to analyze macroeconomic phere	nomena and their	interconnections		
and subsequently to us	e them under the conditions of modern economic life.				
18MAK2	Macroeconomics 2	Z,ZK	4		
Macroeconomics II extends theoretical knowledge acquired from Macroeconomics I of its students with the latest knowledge of contemporary macroeconomics. They are models of					
economic growth, especially those with an emphasis on the role of human capital and technological progress. Furthermore, it introduces students to modern principles of economic					
e	modeling, i.e., macroeconomic models derived from microeconomic behavior of subjects and economics and their rational expectations. It also provides students with modern knowledge				
of labor market modelin	ıg.				

12PIN1	Practical Informatics for Technics 1	Z	2
	systems. Personal computer, workstation and supercomputers. Processor, memory, bus, devices, hard disk, network interfa	.ce. Hardware and	l software.
Principles of operating sy	stems. Requirements on operating system for research and technical computing. Operating system UNIX. Basic principles, kerne	el, kernel services.	Documentation.
File system, file atributes	s, working with files. Text editors: vi, emacs. Command interpreter (shell) sh, csh and its programming (scripts). Controlling pro	cesses, process s	status, computer
load a process priorities	. Standard tools. Graphical user interface X-windows. Computer networks. Local computer networks. Global computer netwo	rks: Internet. Addr	esses and
protocols TCP/IP. Netwo	rk configutation of a computer. Network services: hardware sharing, mail, ftp, etc. Network applications		
18PRC1	Programming in C++ 1	Z	4
This course covers main	nly the C programming language and non-object oriented features of the C++ language.		
18PRC2	Programming in C++ 2	KZ	4
This course covers the	object oriented programming and othesr advanced constructs in the C+;+ programming language and the Standard Template	Library.	
18MTL	Programming in MATLAB	Z,ZK	5
Introducing Matlab envir	ronment as efficient tool for computation in complex arrays and symbolic variables, namely for linear algebra, mathematic an	alysis, statistics, a	Igorithmization
and geometric represen	tation of results.		
18MPT	Programming in MATLAB	KZ	5
The subject acquaints s	tudents with various programming techniques in the Matlab environment. The emphasis is placed on the differences in progr	amming methodo	logy in Matlab
compared to classical la	inguages.		
18PJ	Programming in Java	Z,ZK	5
	o the Java platform and to the development of the basic types of applications for this platform.	, 1	-
18INTA	Development of internet applications	KZ	4
-	overview of modern technologies for the development of web applications. Students will learn basic web languages and con-		L. etc.) and they
	o relational database systems. The tutorials are dedicated to practical examples of building web applications, from the simple		
	ards backend technologies and using the Python languages, but covers also frontend frameworks and JavaScript.		
12ZDP	Data Processing for Publishing	7	2
	omputer-assisted publishing, coding of text, OCR (optical code recognition), DTP (desk top publishing), programming langua		_
	ng into www pages, cloud computing, commonly used graphical formats, formatting of typical data (PDF, PS, DOC, DOCX, Pf		
multimedial presentation		0,110,0,11,7	
00EKOT	Economy in Technology	Z	1
	he basics of micro- and macroeconomics.	2	I
		Z	1
00RET	Rhetoric	- 1	-
	In the acquisition of speech and voice techniques and on the rules of correct pronounciation. The course is also devoted to the		
	al aspects. Stylistics exercises, strategies for coping with stage-fright and a short excursion into the history of rhetoric are an		
00UPRA	Introduction to Law	Z	1
00UPSY	Introduction to Psychology	Z	1
12AUX	Administration of UNIX System	KZ	2
Basic and more advance	ed administration of Unix operating system		
01ALG	Algebra	ZK	4
After an introduction into	the set theory standard algebraic structures are dealt with: groups, rings, fields, modules, linear algebras, lattices, Boolean a	lgebras, rings of p	olynomials over
commutative fields.			
01ALGE	Algebra	Z,ZK	6
Firstly, the Peano axiom	s are treated in detail. Elements of the set theory cover only: equivalence and subvalence, the Cantorov-Bernstein theorem, t	ne axiom of choic	e and equivalent
statements, definition of	ordinals and cardinals. Further standard algebraic structures are addressed: semigroups, monoids, groups, rings, integral do	omains, principal i	ideal domains,
fields, lattices. Independ	lent chapters are devoted to divisibility in integral domains and to finite fields.		
11ANEL	Linear Circuit Analysis	Z,ZK	4
The course is the introd	uction to the linear electronics for physicists. In the first part it describes basic methods of linear circuit analysis. It is especial		understanding
of the computer method	s of analysis. The second part gives a short list of most commonly used circuits in experimental equipment.		
15CHEM	Analytical Calculations and Chemometry Principals	ZK	2
	principles of chemometry including errors in classical and instrumental analysis, probability theory, propagation of errors, ba		
	esting, hypothesis testing, least squares regression and correlation, calibration and fitting methods, non-parametric testing, s		
-	metry of redox, acid-base, complex and precipitation reactions, gravimetric stoichiometry, pH calculations, calculations in pot	-	-
spectrophotometry and	separation methods, solving of complex forming equilibria.		
04ABZK	English - State Examination	ZK	5
	e examination as given by the study plan. Student is eligible for the State language examination (level C1 or B2 of CEFR) on		
	examinations (04AP3KK, 04APAK, 04API, and 04APRK). From its first semester, part of the APIN programme covers also ex		
	comply with respective rules and regulations for state language examinations.	,	·····
04AM1	English for Intermediate Students M1	Z	1
	for students who have successfully completed the full secondary school English language course at least at the A2 level of th	I	-
-	ages (CEFR). It provides an introduction into English for Specific and Academic Purposes (ESP, EAP), i.e., into fundamentals	-	
-	itten communication situations. Thus it covers topics related to the student's life and needs as well as topics of subtechnical		
	e of grammar issues used in EAP.		
04AM2	English for Intermediate Students M2	Z	1
-	ects the student to have completed the 04AM1 course. It develops their skills for work with subtechnical texts, focusing also mo	- 1	-
	of ESP and EAP (e.g., definition, existence and classification of phenomena, object descriptions). Part of the course is also guid		
revision is included.			, grannia
04AM3	English for Intermediate Students M3	Z	1
	e skills that enable students to cope with features typical of professional style. Increasing attention is paid to developing subtech	- 1	-
	sional texts. Great emphasis is placed on distinguishing different levels of formal and informal oral and written communication	-	-
	also includes studying abstracts and rules for writing them as well as basic rules for preparing and giving a short presentatio		
student's field.			

04AP1	English for Advanced Students P1	Z	1
The course is designed	for students who have successfully completed the full secondary school English language course (at least the B1 level of the	Common Europe	ean Framework
-	ages - CEFR). It provides an introduction into English for Specific and Academic Purposes (ESP, EAP), i.e., into the fundame		
	cal of professional oral and written communication situations (fundamentals of terms in mathematics and physics, definitions,		
	and written communication on topics related to the undergraduate's life and needs. It develops skills for free professional writing	J (writing a CV, lett	er of application,
	sary, revision of selected grammar topics is included.		4
	English for Advanced Students P2		1 Inner Asserting
	sed on 04AP1, thus extending the student's skills for working with subtechnical texts, and even with professional texts of chose t concentrates on chosen grammar topics, but mainly intends to develop understanding of syntactic structures and typical rhe		-
	ind, if possible, a case study). Increasing emphasis is placed on the undergraduate's independent work with and reading of lin		
	ktends the student's subtechnical vocabulary, and includes fundamental notions of chosen branches of science. It is focused		-
	n structure, linking, cohesion and coherence in texts.	5	J J J J
04AP3	English for Advanced Students P3	Z	1
	used on 04AP2 and expects the student to work without any guidance with authentic professional materials and to interpret th	e text. It includes	training oral and
written communication	skills and functions (e.g., expressing an opinion, agreement, and objections; taking part in discussion, note-taking; summarizition and set of the set of	ing, writing an abs	stract) and, if
possible, also preparing	a project on a given or chosen topic and presenting it. The course places emphasis on distinguishing levels of formal and intervention of the second se	formal language b	ooth in oral and
written communication.			
16APLB	Application of Ionizing Radiation in Analytical Methods	ZK	5
	of ionizing radiation in analytical methods is devoted to radioanalytical methods and the use of radionuclides and ionizing radia	ation in the analys	is and diagnosis
of technological process			
12APL	Application of Lasers	Z,ZK	2
	ndustrial technologies, medicine, remote sensing, energetics, telecommunication, military, entertainment and other branches		-
11APLG	Applications of Group Theory in Solid State Physics	ZK	2
	system symmetry allows, without any quantitative calculations, rigorously and precisely determine how many energy states		
	them may occur. Therefore, the main purpose of this course is to describe the methods by which we can extract the informa		
	pplication of these methods is illustrated by an example of molecular orbitals, inner orbitals of ions in the crystal field environ a rules for optical absorption transitions.	ment, normai mot	
02AMS	Atomic and Molecular Spectroscopy	Z,ZK	4
	b atomic and molecular spectroscopy.	2,21	4
04CESM1	Czech for foreigners - Intermediate	Z	1
	n correct pronunciation, important morphological phenomena, prepositional phrases, and verb forms as well as on extending the	- 1	I Julary for various
social situations.			
04CESM2	Intermediate Czech 2	7	1
	e topics covered in CESM1 and is then focused on more difficult grammar phenomena. It practices writing, speaking, and rea	- 1	·
	on abbreviations, abbreviated words, and mathematical terms and formulas.	<u>.</u>	
04CESM3	Intermediate Czech 3	Z	1
	morphological topics covered earlier and extends the student's knowledge of more difficult language phenomena. It is espec	ially focused on s	tylistics and
lexicology and on develo	oping the student's writing skills.		
04CESP1	Czech for Foreign Students - Advanced Examination	Z	1
The prerequisite of the c	course is very good knowledge of the Czech language, i.e., communicative competences at least at level B2 of the Common E	uropean Framewo	ork of Reference.
It is focused partly on re	vision of standard language structures, but mainly on practising more complex grammatical structures typical of the style of	science. Students	are taught the
-	e of engineering and professional communication, both in spoken and written form. The topics include University Studies and	Student Life. Writ	tten practice
	with teachers and faculty administrators.		
04CESP2	Czech for Foreigners - Advanced	Z	1
	student's knowledge acquired in CESP1 and focuses on difficult language phenomena. It practises working with technical a	nd specialist texts	s placing greater
emphasis on individual			4
04CESP3	Czech for Foreigners - Advanced	Z	1
	e student's knowledge from CESP2. It includes working with authentic specialist materials, their interpretation and presentation g skills necessary for professional communication are trained.	on, and, infally, pre	esentation of the
15DALCH	History of Alchemy and Chemistry	ZK	2
	e overview of crafts with chemical and/or metallurgical basis. Development of alchemy from ancient times in China, India, and	I I	
	s dedicated to Alchemy in Arabic world and various aspects of alchemy in Latin Europe. The influence of alchemical approac		
advancement is illustrat			
02DEF2	History of Physics 2	Z	2
Development of classica	al mechanics after Newton, Bernoulli's, Euler, Lagrange. Historical development of optics, corpuscular and wave approach. E	lectricity and mag	netism -
electrostatics, galvanisn	n, electrodynamics and electromagnetism, Faraday and Maxwell. Thermodynamics and its laws, statistical physics, Boltzman	n. The birth of mo	dern quantum
and relativistic physics,	Planck and Einstein. Discovery of radioaktivity, structure of atom, atomic nucleus, Rutherford and Bohr. The way to nuclear e	nergy, Elementary	y particles,
standard model. The co	ncept of Nature and Universe of today.		
01DEM	History of Mathematics	Z	1
-	n of regular seminars where the members of the department of mathematics, but also invited speakers - specialists in the field	- give their talks o	on varoius topics
from the history of math			
02DRG	Differential Equations, Symmetries and Groups	Z	4
	ure is to teach students computation of symmetries of the differential equations.		
01DIM3	Discrete Mathematics 3	Z	2
solution chosen from the	o elementary proofs of non-trivial combinatoriwal identities and to generating functions and their applications. In the seminar	students present	a problem with
		7 71/	2
11ELEA The course is the introd	Instrumentation and Measurement uction to the instrumentation and measurement for physicists.	Z,ZK	2
14ELMI	Electron Microscopy	Z,ZK	3
	nts are introduced to the microscopic methods used for the characterization of materials, thin layers or nanoparticles. The introduced to the microscopic methods used for the characterization of materials, thin layers or nanoparticles.	I ' I	-
	ctron microscopy and to various types of microscopes. An important part of the course is given to the interaction of different t		
mathematical formulation	ns and tools used in microscopy and to the description of particular parts of the microscopes. Introduction to kinematic and d	ynamic theory of	diffraction, types
of contrast, and diffraction	on and imaging techniques are also covered. A particular attention is given to analytical methods and imaging techniques in	atomic resolution	

			· · · · · · · · · · · · · · · · · · ·
18ESPG1	European Computer Driving Licence 1	Z	2
	s are an important tool, especially for students and graduates in Software engineering in economics. The winter semester intro		
	is put on advanced functions of MS Excel (names, functions and expressions, pivot table and graph). Next, the VBA languag	e will be introduce	ed and macros
and user functions will I			
18ESPG2	European Computer Driving Licence 2	Z	2
	s are an important tool, especially for students and graduates in Software engineering in economics. Summer semester follows cs (charts, objects, graphical user interface, add-ins programming) and introduces some applications in economics, mathema		
computer science.			esearch, and
16EPAM	Exact Methods in Research of Historic Monuments	ZK	2
	storic monument investigations, methods of age determination (radiocarbon, thermoluminescence and related methods, further rad	1	
	halytical methods for determination of origin and production technologies of artefacts (activation analysis, X-ray fluorescence		0
photogrammetry.		····, ·····	,,
02EXF1	Experimental Physics 1	Z	2
	ntroductory course in experimental physics. Students will learn methods of measurement of basic physical quantities and me	1	
02EXF2	Experimental Physics 2	ZK	2
	ntroductory course in experimental physics. Students will learn methods of measurement of basic physical quantities and me	thods of measure	ment evaluation.
17ENF	Experimental Neutron Physics	KZ	2
	r focused on detailed characterisation of neutron properties, characteristics of neutron (reactor and non reactor) sources, pro	1	1
neutrons, neutron detec	ction methods, neutron induced nuclear reactions, modification and adjustment of neutron field, science and industry neutron	applications. Las	t lecture deals
with experimental data	processing and analysis. The lectures are supplemented with experimental practices in the field of neutron detection, determina	tion of delayed ne	utron properties,
study of neutron diffusion	on in various materials, preparation and characterisation of photo-neutron source and neutron source calibration. Experimental	practices will be ru	unning at training
reactor VR-1 and in the	neutron laboratory.		
04FM1	French for Intermediate Students M1	Z	1
	M The objective of this three-semester course is to improve and further develop communication in the French language in bo		
	icate in social interaction and in academic, scientific and professional environment. They will be able to use the language to the	-	
	e problems. 04FM1 The course builds on and further develops linguistic competence acquired at secondary school. It revises, s		
	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	1	r
04FM2	French for Intermediate Students M2	Z	1
	FM1. Linguistic structures and competence acquired in previous study are systemized and expanded. Reading popular science (passives, nominalization, word formation). Topics: physics, power engineering, environment, Internet, success of French sci		
	rchitects. Description of an object, device, shapes, dimensions, material.	ence and technolo	Jgy, i tench
04FM3	French for Intermediate Students M3	Z	1
	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	-	
04FP1	French for Advanced Students P1	Z	1
-	The objective of this three-semester course is to improve and further develop communication in the French language in both	-	orm. Students
	icate in social interaction and in academic, scientific and work environment. They will be able to use the language to transmit		
and to solve problems.	04FP1 The course builds on and further develops linguistic competence acquired at secondary school. Difficult grammar topi	ics are repeated a	ind expanded:
subjonctif, passé comp	osé-imparfait, pronouns. The following specific topics are covered: University studies in our country and in France, writing of t	ransactional letter	rs, CV, personal
statement, request, ans	swer to an advert, environmental issues, success of French science and technology, chosen topics from French regional cultu	ure, Paris. Topics o	of specialization:
mathematics, internet,	physics, chemistry. Reading of technical and popular science texts, further work with these texts and interpretation.		
04FP2	French for Advanced Students P2	Z	1
	ents, the course further develops language skills. Focus is put on reading popular science texts and on oral communication of	n given topics. Fe	atures typical of
	communication are stressed (passive voice, nominalization, word formation).		
04FP3	French for Advanded Students P3	Z	1
	on systemization and improvement of acquired linguistic competence, skills and knowledge, and their use for communication in		-
	rter texts (both from and into the language). Writing of a paper and making oral presentation in-class. The paper generally co	vers a technical /a	applied science
-	rk compiled from 3 French sources. Preparation of several set topics for oral examination.		
04FZ1	French for Beginners Z1	Z	1
-	ne objective of this 5-level course is to be able to communicate in French orally and in writing in situations of everyday life, in	-	-
	ench for specific / technical communication and reading of popular science and scientific texts. 04FZ1 The objective is to be a		-
	knowledge of chosen elementary language. The contents is roughly outlined by lessons 1 - 7 of the textbook Pravda - Pravd áte ky). It is extended with situations of communication and functions from the textbook Espaces I, lessons 1-4 : introductions		•
	mple instructions and questions. Special attention is paid to pronunciation. Spelling is explained in connection with pronuncia	-	-
04FZ2	French for Beginners Z2	Z	1
	p with 04FZ1. Elementary linguistic knowledge and communication skills are expanded. The scope is given by lessons 8 - 13 (
	Additional topics and skills are filled in from the textbook Espaces I, lesson 1 - 5 (introductions, invitation, welcoming, agreer		
-	p 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.		
04FZ3	French for Beginners Z3	Z	1
	04FZ2. Basic linguistic knowledge and skills are developed. The contents is given by lessons 14 - 18 of the textbook: Pravda	1	1
	tuations are complemented from other materials. Stress is put on oral communication in dialogues and on reading, both for in		-
	Reading covers short adapted texts of general interest first, and later popular science texts.		
04FZ4	French for Beginners Z4	Z	1
The course builds up or	n 04FZ3. Basic linguistic knowledge and skills are further developed. Oral communication and reading skills are practiced. Th	e contents is roug	hly covered with
	xtbook French for Beginners, and is expanded with topics and functions from other materials. Reading is developed from the le		
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, u	niversity in our
country and in France,	how to write CV, application, topics in mathematics, reading physics - mechanics, informatics, internet.		

04FZ5 French for Beginners Z5	Z	1
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	. – .	
general contents is covered by lessons 24 - 26 of the textbook: Pravda-Pravdova, French for Beginners, and is complemented from other materials.		
notes, success of French science and technology, information about France. Grammar is systemized and complemented with syntax (subordinate cl	,	
subjunctive clauses, gerund, passive.		, ,
01FKP Functions of Complex Variable	ZK	2
The course develops advanced properties of systems of holomorphic functions, Ascoli-Vitali's theorem, advanced properties of conformal mappings,	1 1	
functions. Basic properties of complex functions of several complex variables together with improper line integrals and its applications are presented		
01FKPB Functions of Complex Variable B	Z	2
The course develops advanced properties of systems of holomorphic functions, Ascoli-Vitali's theorem, advanced properties of conformal mappings,	1 1	_
functions. Basic properties of complex functions of several complex variables together with improper line integrals and its applications are presented		na meromorphie
01FAN1 Functional Analysis 1	Z,ZK	4
Basic notions and results are addressed concerning successively topological spaces, metric spaces, topological vector spaces, normed and Banach		-
01FA1 Functional Analysis 1	Z,ZK	3
Continuing course of mathematical analysis and algebra introduction to the basics of functional analysis. There are the concepts that students need to and technical disciplines	to understand the	various priysicai
and technical disciplines.	7 71	4
01FA2 Functional Analysis 2	Z,ZK	4
The course aims to present selected fundamental results from functional analysis including basic theorems of the theory of Banach spaces, closed of	operators and the	ir spectrum,
Hilbert-Schmidt operators, spectral decomposition of bounded self-adjoint operators.	1/7	0
02PRA1 Experimental Laboratory 1		6
Lecture is intended especially for students who intend to study some of the physical specializations of FNSPE(branch Physical Engineering, Nuclear		
attended by students interested in the otherspecializations. In Experimental laboratory students learn how to prepare for experiments (including work wit	-	-
of the measurement (acquire of different experimental procedures and routines), willteach writing the records of measurement, processing and evaluate the second seco	Jation of results. A	t the same time
practically extend the knowledge gained in lectures on physics.		
02PRA2 Experimental Laboratory 2	KZ	6
Lecture is intended especially for students who intend to study some of the physical specializations of FNSPE(branch Physical Engineering, Nuclear		
attended by students interested in the otherspecializations. In Experimental laboratory students learn how to prepare for experiments (including work with	-	-
of the measurement (acquire of different experimental procedures and routines), willteach writing the records of measurement, processing and evalu	Jation of results. P	t the same time
practically extend the knowledge gained in lectures on physics.		0
02FYS1 Physical Seminar 1	Z	2
The seminar is devoted to detailed study of interesting physical problems. It should help students to deeper understanding of fundamentals of physical values are abased on a studied and accounted by the students the merchanism with the passibility to use DC and physical laboratory are		e course of
Mechanics. The problems are chosen, studied and presented by the students themselves, with the possibility to use PC and physical laboratory equ		0
02FYS2 Physical Seminar 2	Z	2
The seminar is devoted to detailed study of interesting physical problems. It should help students to deeper understanding of fundamentals of physical problems.	-	
Electricity and Magnetism. The problems are chosen studied and presented by the students themselves, with the possibility to use PC and physical		
01GTDR Geometric Theory of Ordinary Differential Equations	Z	2
The seminar consists of the qualitative theory of ODEs dealing with the geometric and topological properties of the solution. In this context, we mention	n suitably formula	ted basic results
of the existence and uniqueness, continuous dependence on parameters and initial conditions. Main part is devoted to the autonomous systems.		-
12INS1 Information Systems 1	Z,ZK	2
Information technology, architecture of the databases, network databases, cloud application Google, Microsoft, information managament, aproaches to		-
12INS2 Information Systems 2	Z,ZK	2
Graduation of Information systems 1 is required. In more details: Information technology, architecture of the databases, network databases, cloud ap	plication Google,	Microsoft,
information managament, aproaches to solve task of information systems		
16ZJTB Nuclear Energy Facilities and Accelerators	ZK	2
Basic scheme of nuclear reactor and nuclear power plant, chain fission reaction development, main components of nuclear energetic reactor, most i		
high-voltage accelerators, linear high-frequency accelerators, accelerators based on cyclotron, microtron, betatron, electron and proton synchrotron	s, electron and ior	n sources for
accelerators, targets.		
17JARE Nuclear Reactors	ZK	2
Introduction. World power issue. Previous evolution of power reactor. Nuclear fission reactors, fuel assemblies, active core, control systems, safety sy		
of reactors into IV generations. Standard types of nuclear power reactors: concept, description, layout, previous evolution, world share, perspectives. F		
Western-type PWR (Westinghouse, KWU, Framatom). VVER-type reactors, Temelín nuclear power plant. Boiling water reactors. Heavy water reactors		
high-temperature gas cooled reactors. Second nuclear era. reactors of generation III (EPR, AP-1000, VVER 1200). Reactors of generation IV: GIF a		es. Evaluation
and selection of proposed systems. Six selected concepts. ICRP scenarios of word evolution, hydrogen power, role of nuclear power in long-term ou		
01JEPR Simple Compilers	Z	2
Lexical and syntax analysis, code generation, simple optimizations, development environments, reflection.		
16KPR Clinical Propaedeutic	ZK	2
Making students familiar with the basics of anamnesis, physical examination, examinational methods of different organs, hematological and biochemi		and anaesthesia
04AKS English Conversation	Z	1
The course will develop the student's communication skills acquired throughout their previous studies. It aims to improve all aspects of oral commun	ication. The stude	ent will develop
their vocabulary for various communication situations and will master their communication strategy. They will also practise their listening skills in order		and participate
in discussions. The student will be trained to express their ideas clearly and according to current English usage, and become a more confident spea		
02KF Quantum Physics	Z,ZK	3
State description, wave function, postulates of quantum mechanics, Born s statistical interpretation, expectation values, Schrödinger equation, Heis	enberg uncertain	ty principle,
quantization of angular momentum, solution of simple systems, hydrogen atom.		
02LCF1 Experimental Laboratory 1	Z	2
Cavendish experiment. Elasticity. Thermal capacities. Electric measurements, Acoustic. Oscillations.		
02LCF2 Experimental Laboratory 2	Z	2
Electric and magnetic field, microwaves, Xray and gamma rays, geometric optics		
12LT1 Laser Technique 1	Z,ZK	3
Open resonators. Stability. Transverse and Longitudinal Modes. Elements of Open Resonators. Threshold of laser oscillations. Gausian beam as an		he fundamental
mode. ABCD method. Optical radiation propagation in resonant medium. Two-level approximation. Equations for polarisation and inversion, dispersion	on, saturation. Col	nerent and
non-coherent pulse propagation. Optical solitons. Photon echo. Superradiation. Amplified spontaneous emission Lasers without optical resonator.		

12LAS Lass of Systems 2.2.K 3 Parces of data in source of tesms in Sprace gaves a cancer. Leave shifts by a sprace of data issues. The test issue. The test issues. The test issues is the test issues. The test issues issues. The test issues issues. The test issues issues. The test issues issues issues. The test issues issues. The test issues issues. The test issues issues issues issues issues issues issues issues. The test issues issues issues issues issues issues issues issues issues issues. The test issues iss	12LT2	Laser Technique 2 e equation, the laser amplifier, Q-switching, mode-locking	Z,ZK	2
Paladet state margemont sons ² . Percentagenet lases, flage energy loser systems, Lases faulo, Diede grunpet solid atte lases, ² Optimization and the sons ² . Optimization and the sons ² o			Z.ZK	3
paner contrains laces. Interest high power laces. Submittanter laces Laces alsh righ degree of cohomons. Fees electron laces. 01LIP U.Interest Programming Z,ZK 3 We study special problems about constained extremum problems for multivariable functions (the function is linear and the constant of equations, are grown by linear equations, and the constant of equations, are grown by linear equations, and the constant of equations, are grown by linear equations, and the constant of equations, and the constant equations, and			,	ic generators
01LIP Linear Programming Z.ZK 3 04.bit yespit optimal requirem a data caracterize darmaning patients for multivariable functions (the function is linear and the constanting equations and patients and income integrates). Z.ZK 4 01MARR Markov processes Z.ZK 4 01MARR Essentials of High School Course 2 Z 1 00MMM1 Essentials of High School Course 2 Z 1 00MMM2 Essentials of High School Course 2 Z 1 01MMPV Markhomatical Markov and the course 1 Z 1 01MMF Markhomatical Markov and the course 1 Z 1 01MMF Markhomatical Markov and the course 1 Z Z 1 01MMF Markhomatical Markov and the course 1 Z 1			aviolet lasers. X-r	ay lasers. High
We sub-special gradem about consistent exemum publiers for multionishie functions (the function is linear and the constants equations are given by linear equations and linear inequalities). OTMAPR Markov processes Z 4 OTMAPR Markov processes Z 2 2 OTMAPR Markov processes Z 2 2 OTMAPR Markov processes Z 2 1 OTMAPR Markov processes Z 1 2 1 OTMAPR Essentials of High School Course 1 Z 1 1 2 1 OMMMP Essentials of High School Course 2 1 2 1 <td>·</td> <td></td> <td>7 7K</td> <td>3</td>	·		7 7K	3
DIMARR Marketory processes Z.K 4 10 MASC Marketory processes 2 2 The uspect of severate to practical user's distributes - setting using the Negrona with and an advance of answering the Negrona with and analysis of answering the Negrona with and analysis of answering the Negrona with and analysis and non-parameter isotrations and market of answering distributes of attributes and non-parameter isotrations and market of answering distributes of attributes and non-parameter isotrations and market of answering distributes of the Negrona with and analysis of the School Course 1 Z 1 00MAMI Essentials of High School Course 1 Z 1 2 1 00MAMI Essentials of High School Course 1 Z 1 2 1 00MAMI Marketory and the Marketory and the Marketory and the Marketory and the School Course and the Advance and the Marketory and the	• • = • •			-
Of MASC Mathematical Statistics - Seminar Z 2 To escape id electronic to practical une statistical method statistical in the current bulkening in thissed method in the current bulkening in thissed methods, finding unbiased methods and methods, finding unbiased methods, and finding unbiased methods, and finding unbiased methods, and finding unbiased methods, and finding unbiased	inequalities).			
The subject is devoted to practical use of admitted methods studied in the course Mathematical Statistics 01MAS. The turcied deals with calculators of critical regions for productions thermiting using using statistics of the subject of strategies and method presentations. OMMAN1 Essentials of High School Course 1 Z 1 Device of statistics of High School Course 1 Z 1 Device of statistics of High School Course 1 Z 1 Device of statistics of High School Course 1 Z 1 Device of statistics of High School Course 1 Z 1 Device of statistics of High School Course 1 Z 2 Of MMPV Mathematical Models of Groundwater Flow products in the state at advate of advater of the state at advate at adv		Markov processes		4
statistical models, finding unbiased estimates with minimal winning unarrance, parameter estimation of periments and method of moments and method of measurem likelihood durine for a circle ingines for typoshelis instiguid upper therms and method and inclusion of an officiance intervols and non-parametric density estimation. OUMAM1 Essentials of High School Course 1 Z 1 Downson 1 Essentials of High School Course 1 Z 1 Downson 1 Mathematical Models of Corundwater Flow KZ 2 The course provides an overview of computational motios to selected groundwater flow replans. The first part of the course is devolded to mathematical forwaters. CZK 6 The course provides of Nathematical Environmentation is see advacation of the separation of an advacation. The heary of devolutions and the period thematican is see advacation of the separation of an advacation. ZZK 6 The course provides an orientation provide set of the course is devoluted to mathematical formations. ZZK 6 The course provides an orientation and method provides of the course is devoluted to mathematical regions and the second and course and second and course and period second to advacation method and period method and the second and course and		I I I I I I I I I I I I I I I I I I I	_	
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00MMA2 Essentials of High School Math Course 2 I 01MMFV Mathematical Models of Groundwater Flow KZ 2 01MMFV Mathematical Models of Groundwater Flow problems. The first part of the course is downater flow and an animal state at selected numerical methods, emphasizing implementation susce stelead to insker methods. 2.7.K 6 01MMF Methods of Mathematical Physics Z.ZK 6 The course provide an instructure to the theory of distributions with applications to a solutions of partial differential equations with constant colleans, further the Feddibility methods and the oppoletions. The instruction applications of the sample acquirity with provide constant on antimuse provides and instructions and mode problems. 2.ZK 4 The course provide an instructure start of within the oppoletions. Descriptions of the sample acquirity is and Microproprocessors of partial afferential equations with constant constant on course is a well as Structure to the induction of instructure is a proprint partial. Z/ZK 4 The course provide an information is an opponent to mathematical instructure is a well as Structure to the induce of a constant on the digital electrones for PA structure to opponent to the induce of the informatical is a town. Z/ZK 4 12MPR2 Microprocessors 2 A A Z Z Z Z Z Z Z Z </td <td></td> <td></td> <td></td> <td>nical regione for</td>				nical regione for
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01MMEV Mathematical Models of Groundwater FDW KZ 2 1 Mathematical Models of Groundwater FDW Figure provises a newney of comparitional reliable in the second groundwater fow proteins. The first part of the courte in decoded for mathematical formation of these probers. The second part is alreed at elected numerical methods, emplacing intermetation issues relied to these methods. CZ.K 6 01MME Methods of Mathematical Physics ZZ.K 6 The course provides an introduction to the theory of distributions with applications to solutions of partial differential equations with constant ordination of variables method to the solution of variables methods for physiciss. However, each of combination of variables methods for the separation of variables methods for the separation of variables methods. ZZK 4 12MPR1 [Microprocessors 1 ZK 4 4 12MPR2 [Microprocessors 2 ZK 4 12MPR2 [Microprocessors 2 ZK 2 4 12MPR2 [Microprocessors 2 ZK 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2			Z	1
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problems. The second part is aimed at selected numerical methods, emplexing implementation issues related to these methods. OHMME Methods of Mathematical Physics 2.ZK 6 The course provides an introduction to the dropp of dishubicitrs with applications to solutions of partial differential equations with constant conditiones, further the Feddolm theorems and discussed for the case at a continuous solution of some boundary value problems. And more boundary value problems and method problems. 2.ZK 4 The course is the introduction to the digital electronics for physiciss. Indescribes the function principles of combination circuits, simple sequential circuits and compoles circuits like metroprocessors to metrocomytate at more proprocessors 1 ZK 4 Table Course is the introduction to the digital electronics for physiciss. Indescribes the function principles of combination circuits, simple sequential circuits and compoles circuits like metroprocessors to present the compared context. ZK 4 T2MPR1 Microprocessors 1 ZK 4 4 Table Context 2 Microprocessors 2 2		I I I I I I I I I I I I I I I I I I I		
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are discussed for the case of a continuous kernel on a compact set as well as Sturm-Liouville operators on bounded intervals, and applications of the separation of variables method to the solution of solute boundary values problems and imaging problems. 11ML Logical Circuits and Microprocessors Stress fee function principies of combination circuits, simple sequential circuits and complex circuits like microprocessors from microcomputer architecture and principles of interfacing is shown. 12MPR1 Microprocessors 1 KK 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	01MMF	Methods of Mathematical Physics	Z,ZK	6
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11MIK Logical Circuits and Microprocessors Z.ZK 4 The course tile interduction to the digital electronics or physicals. It describes the function principles of combination circuits, simple sequential circuits and complex circuits like microprocessors. The microprocessors 1 ZK 4 12MPR1 Microprocessors 1 ZK 4 Architecture 1A32, Data Jones and addressing. Memory types CPU, memory lipped mode. Instruction set, Assembler and Macrossesmbler, programming languages. 12MPR2 Microprocessors 2 ZK 2 Basic ideas on microprophene ZK 2 12MDF Machecular Studies memory types CPU, memory languages. ZK 2 Basic ideas on microprophene ZK 2 ZK 2 12NT Nanotechnology ZK 2 ZK 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2			e separation of va	ariables method
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04NM3 German for Intermediate Students M2 Z 1 The course introduces other more complex grammatical structures and their application in communication based on technical texts, such as the relation between technology and society, the world at the beginning of the 21st century, linguistically more demanding texts on the environment, the language of mathematics, computers and car technology etc. Students practise reading for information and reading aloud, and appropriate language for various purposes in oral and written communication. The course systematically revises other grammatical phenomena important for professional discourse (participles, relative clauses). 04NP1 German for Advanced Students P1 Z 1 This course requires good grammar knowledge, extended general vocabulary, and good communication skills acquired at secondary school to be levelled off at the beginning of the course. The course is then focused on working with technical and scientific texts and practising reading techniques (skimming, scanning, reading for detail). It revises and develops more difficult grammar structures necessary for understanding a subtechnical text (passive voice, participles, participle structures) and it also focuses on practical everyday communication, i.e., telephoning. 04NP2 German for Advanced Students P2 Z 1 The course develops the students' skills in working with professional scientific texts (understanding, summarising, note-taking, interpreting) while extending their general and subtechnical vocabulary range. It introduces mathematical expressions and texts of nuclear power engineering. Increasing emphasis is placed on understanding and practising formal communication, both written and o	practise reading for infor	mation and reading aloud, and appropriate language for various purposes in oral and written communication. The course system	natically revises o	ther grammatical
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01NME2 Numerical Methods 2 The course is devoted to numerical solution of boundary-value problems and intial-boundary-value problems for ordinary and partial differential equation	KZ	2
boundary-value problems to initial-value problems and finite-difference methods for elliptic, parabolic and first-order hyperbolic partial differential equal	-	
15CH1 General Chemistry 1	Z	3
The most important concepts, quantities and units used in chemistry are introduced in the course General Chemistry I. Their significance and pract solved in exercises.	cal use are illustra	ated by examples
15CH2 General Chemistry 2	Z,ZK	3
The subject is the continuation of the course General chemistry I. The main attention is paid to general principles governing chemical processes. Us		
the validity of these principles is not restricted only to chemical processes is documented. The significance and practical use of explained principles in exercises.	are inustrated by	examples solved
02OR General Relativity	ZK	3
Introduction to general theory of relativity: principle of equivalence and principle of general covariance, parallel transport and geodesic equation, gracitational law. Schwarzschild solution of the Einstein equations, homogeneous and isotropic cosmological models.	avitational redshift	. Curvature and
01POPJ1 Computers and Natural Language 1	Z	2
Basic course of computational processing and understanding of natural languages. Automatic methods of morphological and syntactic analysis incl	-	tistical methods
of result disambiguation will be discussed. Two-level morphology, tagging and language models, Viterbi algorithm, grammars, chart parsing, probab 01POPJ2 Computers and Natural Language 2	7	2
The goal of the course is to get acquainted with the broad topic of machine translation (MT). Machine translation is a challenging task that can serve	. –	. –
of systems as complex as natural languages. We cover several rather different approaches to the task as well as issues related to automatic and m	anual evaluation o	f translation
quality. 12POAL Computer Algebra	KZ	2
Lisp, representation of basic objects (integers, rational and algebraic numbers, polynomials, rational functions, radicals, algebraic functions), arithmeti	1	1
divisor, resultant, derivation, series summation, integration, ordinary differential equations, factorization, equations solving, quantifier elimination, su	-	- 1
algebraic programming, graphics, Maple - detailed introduction and solving of practical examples, applications, overview of other systems (Axiom, Ma 01POGR1 Computer Graphics 1	Z	2
The first part of the two-semester "Computer Graphics" course is devoted to the specifics of digital display devices spanning from history up to the st	-	
a survey of fundamental problems in 2D computer graphics is given together with their solutions. Focus is put on mathematical description of problems a	•	
algorithms using knowledge previously obtained in a variety of subjects available at FNSPE. The final part of the course covers the applications of or the process of authoring scientific documents and presentations.	computer graphics	approacnes in
01POGR2 Computer Graphics 2	Z	2
The second part of the two-semester "Computer Graphics" course begins with a brief introduction to signal theory in the context of aliasing - a phen		
graphics. Further, a well structured survey of fundamental problems in 3D computer graphics is given together with their solutions, from the descrip rendering. Focus is put on mathematical description of problems and explanation of the corresponding algorithms using knowledge previously obtain		
at FNSPE. The algorithm implementation aspect such as data structures design etc. is also a matter of concern. In the last lecture, a number of the	-	-
using Blender, an open-source 3D modeling and rendering software instrument.		
01SITE1 Computer Networks 1 Understanding the history and present network (LAN, WAN, use the principles and technologies). Architecture of reference model ISO/OSI. Network	Z k protocols, practic	2 al exercises with
TCP/IP communications. Internet services - mail, remote access, www. Secure communication, tunneling. Directory services, certificates, certification		
(PKI). Use in practice. Network security - firewalls (packet filters, proxies, gateways, NAT, DMZ), practical exercises. (According to the interest - the	1	
01SITE2 Computer Networks 2 Understanding the history and present network (LAN, WAN, use the principles and technologies). Architecture of reference model ISO/OSI. Network	Z	2 al exercises with
TCP/IP communications. Internet services - mail, remote access, www. Secure communication, tunneling. Directory services, certificates, certification	authorities, public l	key infrastructure
(PKI). Use in practice. Network security - firewalls (packet filters, proxies, gateways, NAT, DMZ), practical exercises. (According to the interest - the security - firewalls (packet filters, proxies, gateways, NAT, DMZ), practical exercises.		
01POPR Advanced Probability The subject is devoted to advanced Theory of probability and statistics on measure-theoretic level for general distributions of random variables. We	deal with sample :	2 and integral
characteristics of random variables and convergence criteria. Further, the theory of statistical model estimation and testing is extended for paramet	-	-
12PIN2 Practical Informatics for Technics 2	Z	2
Practically oriented three semester course of basics and applications of informatics for science and engineering included as obligatory alternative of in computer classrooms. The second part of the course is "Introduction to computer algebra systems?.	ourse. Constituent	t part is realized
12PIN3 Practical Informatics for Technics 3	Z	2
Practically oriented three semester course of basics and applications of informatics for science and engineering included as obligatory alternative of	ourse. Constituen	t part is realized
in computer classrooms. The third part of the course is "Introduction to scientific computing?. 15INPR Laboratory Practice in Instrumental Methods	KZ	4
Practical training of students in the use of selected modern instrumental methods and techniques for solving some physico-chemical analytical and	1	
carried out in the laboratories of Czech Academy of Sciences (Institute of Physical Chemistry) and partly in laboratory at the Department of Nuclea	· · · · ·	
01PRA1 Probability and Mathematical Statistics 1	Z,ZK	6
The subject is devoted to the introduction to Theory of probability and statistics on measure-theoretic level for discrete models, continuous distributi random variables. We deal with sample an integral characteristics of random variables and variants of limit theorems are derived (LLN, CLT). This k	-	
statistical processing of observations and statistical parametric model estimation.		
01PRA2 Probability and Mathematical Statistics 2	ZK	2
The subject is devoted to the statistical techniques for estimation and testing within parametric and nonparametric models such as Maximum likelihood tests, Goodness of fitness tests of models, confidence regions, etc. We focus on real practical applications of these statistical techniques in frame of the statistical techniques in t		
01PRST Probability and Statistics	Z,ZK	4
It is a basic course of probability theory and mathematical statistics. The probability theory is build gradually beginning with the classical definition a	-	
definition. The notions as random variable, distribution function of random variable and characteristics of random variable are treated and basic limi On the basis of this theory the basic methods of mathematical statistics such as estimation of distribution parameters and hypothesis testing are ex		ted and proved.
01PRSTB Probability and Statistics B	KZ	4
It is a basic course of probability theory and mathematical statistics. The probability theory is build gradually beginning with the classical definition a	•	•
definition. The notions as random variable, distribution function of random variable and characteristics of random variable are treated and basic limi On the basis of this theory the basic methods of mathematical statistics such as estimation of distribution parameters and hypothesis testing are ex		ted and proved.
16UAZB Principles of Ionizing-Radiation Applications	ZK	2
Historical outline of applications, review of interaction of radiation with a matter, radiation sources, detectors and instrumentation, evaluation of radi		
penetration and scattering of radiation beams, selected radioanalytical methods, tracer methods, radionuclide dating, further possibilities for the use	e of ionizing radiat	ion.

16FNZB	Problems of Non-ionizing Radiation	ZK	2
	biological effects of non-ionizing radiation and its use in physical praxis. Information about principles, biological effects and its use in physical praxis.	methods used in field	ds of magnetic
resonance and ultras	pund as applied in various types of technical or medical equipment are given as well.		
12PSEM	Problem Seminary	Z	2
	pics from the region of solid materials engineering, physical electronics, materials science, nuclear reactors, dosimetry and a	application of ionizati	-
01PERI	Programming of Peripherals Devices	Z	2
	input and output ports, computer bus. Software libraries for computer peripherals, 3D graphic libraries. Principles of peripherals	rals device drivers.	
01PW	Windows Programming	Z	2
Simple graphical prog	rrams for MS Windows. Basic editing controls. File input and output. User defined components, dynamic type identification ar	nd reflection.	
18PAS	Pascal Programming	Z	4
	ed mainly for students, with little or no experience in programming. It familiarizes the students with the basic concepts in prog	ramming and with th	e Pascal
programming langua			
12PDR1	Data Communication and Interfaces 1	Z	2
Principles of compute	r networks, networks architectures and data transfer. Specification of existing network architectures.		
12PDR2	Data Communication and Interfaces 2	Z	2
Principles of Etherne	standards and basics of protocol suite TCP/IP.		
01PSL	LaTeX - Publication Instrument	Z	2
The course is devoted	to the basics and facilities of computer typography, particularly to the system LaTeX		
01RMF	The Equations of Mathematical Physics	Z,ZK	6
The subject of this co	urse is solving integral equations, theory of generalized functions, classification of partial differential equations, theory of inte	gral transformations	, and solution of
partial differential equ	ations (boundary value problem for eliptic PDE, mixed boundary problem for eliptic PDE).		
02RQGP1	Seminar on Quark-Gluon Plasma 1	Z	1
The aim of the semin	ar is discuss the selection of the most fundamental articles in heavy ion physics.	' '	
02RQGP2	Seminar on Quark-Gluon Plasma 2	Z	1
	ar is discuss the selection of the most fundamental articles in heavy ion physics.	1 1	
04RM1	Russian for Intermediate Students M1	Z	1
•	ed for students with previous knowledge of Russian from secondary schools. Students are supposed to know the Russian alph		nd handwritten).
-	communication in everyday situations (introductions, socializing, greetings, shopping for food and objects of everyday need, a		
	ammar structures (verbal and nominal forms, irregular verbs, pronouns). The initial knowledge corresponds to the achievement		
	f the course correspond approximately to the RZ3 course, but for half of the time allotted in the timetable.		
04RM2	Russian for Intermediate Students M2	Z	1
The course is based	on the RM1 course, its contents and scope correspond roughly to RZ4, however, for half of the time allotted in the timetable.	1 1	
04RM3	Russian for Intermediate Students M3	Z	1
	the knowledge and skills acquired in RM1 and RM2 and its contents and scope are roughly at the same level as those of RZ5	, however, for half of	the time allotted
in the timetable.		, ,	
04RP1	Russian for Advanced Students P1	Z	1
	nent for the course is to achieve the B1 CEFR level. The objective of the course is revision of standard language structures,	practicing more diffi	cult grammar
	ding the fundamentals of technical language and training writing skills.		0
04RP2	Russian for Advanced Students P2	Z	1
The course is based	on RP1. It expands grammatical structures important for understanding technical texts (verbal adjectives, participles, passive	s. verb aspects. spe	cific svntactic
	put on independent oral and written communication.	-,	,
04RP3	Russian for Advanced Students P3	Z	1
	on RP2 and is mainly focused on working with technical and scientific texts (reading comprehension, oral and written paraph	1 1	The RP1 - RP3
	previous knowledge of general language at secondary level (listening, reading, correct communication in everyday situation	. ,	
	tudy is aimed at professional and technical skills (reading technical literature according to the students' specialization, oral a		
	nical vocabulary and practice quick and correct communication in professional situations. They will be able to both speak wri	-	-
technical topics.			
04RZ1	Russian for Beginners Z1	Z	1
	s the first stage of the five-semester programme, its final aim being reading and understanding professional texts written in R	ussian. Thus it begin	s with mastering
the Russian alphabet	(for both reading and writing skills) and fundamentals of grammar necessary for everyday communication (listening and spe	aking). Students will	be able to read
a short text with mark	ed stress, understand its contents and summarize it.		
04RZ2	Russian for Beginners Z2	Z	1
	of the programme is designed to teach skills for basic communication in everyday situations and for reading easy and short	1 1	Students will be
	using short sentences and appropriate structures, and read aloud with confidence a short text without marked stress. They v		
master further gramm	natical structures. They will have mastered with confidence the Russian alphabet and will be able to use it in writing.		
04RZ3	Russian for Beginners Z3	Z	1
The course is based of	n RZ2 and includes further everyday topics, develops understanding of short compact texts on new subtechnical topics (for tr	aining various forms	of reading skills
and listening) and int	oduces new grammar. Students will be trained to distinguish intonation patterns while listening to spoken language. They wil	I be able to respond	so as to be
	press their opinion. Writing skills will be trained on guided writing tasks and note-taking.	-	
04RZ4	Russian for Beginners Z4	Z	1
	on 04RZ3. It improves and expands the knowledge of general language in all four skills (reading and understanding longer te	1 1	rcentage of
	communication in everyday situations, writing longer texts). Students are trained to use grammar structures effectively (e.g.,	-	-
	modality, imperatives, conditionals). They practice and develop communication skills for everyday situations (food, travelling,		
	n on more specific topics (environment, addictions, the green movement). They become acquainted with various geographic		
fill in forms, look up th	e information from the timetable, learn about Russian holidays and typical meals.		
04RZ5	Russian for Beginners Z5	Z	1
	he student to have completed RZ4. It concentrates predominantly on reading skills (working with professional texts, i.e. unders	1 1	nd summarizing
	ecialized text) and speaking, and to a certain extent, writing about the professional information obtained by reading the texts.		-
everyday topics. Stud	ying grammar is based on professional and technical texts and only includes items typically used in professional communica	tion (verbal adjective	es, participles,
passive voice). Stude	nts develop their technical and economic vocabulary, and are also trained in some professional skills (writing a CV, polite rec	uest, etc.)	

01RSWP	Project Management of Software Projects	KZ	2
	agement of software projects is dedicated to an explanation of general ideas, rules and procedures which are common to many		liverse character.
	rresponds to a lifecycle of typical projects including many other aspects which have to be taken into account in the course of th		
is paid to software proje	ect management and to IT projects in general. Interdisciplinary view of project management is emphasized.		
02SMF	Seminar of Mathematical Physics	Z	2
	ninar is to iluminate mathematical physics by virtue of solved examples. It is supposed that the teachers of the physics depar	tment will present	simple tasks
-	fic activities that could become the topics of the student?s bachelor theses in the next year		1
01SSM1	Seminar of Contemporary Mathematics 1	Z	2
	a different approach to those fields of mathematics that are included in curriculum but also to those that are not part of basic	courses of mathe	
01SSM2	Seminar of Contemporary Mathematics 2		2
	a different approach to those fields of mathematics that are included in curriculum but also to those that are not part of basic	1	
16SED1	Dosimetry Seminar 1	Z	2
	sed to motivate the student's interest in the field of dosimetry, especially in medical physics. Introductory lectures will be devo e following lectures are given by the former students of DDAIR, who are currently employed in various organizations (SÚRO,		0
	block, FN v Motole, PTC Czech s.r.o.).	V.V.I., UJF AV K	v.v.i., UJ v ez,
16SED2	Dosimetry Seminar 2	Z	2
	follows-up SED1. In this seminary students will listen to the lectures of the older students of DDAIR. The older students give le	-	1
	heses. The course also introduces the principles of creating good presentation and advice for working with scientific literature		progrood on the
01SMB1	Seminar on Calculus B1	Z	2
	to support the lectures of Calculus B3.	-	-
01SMB2	Seminar on Calculus B2	Z	2
	to support the lectures of Calculus B4.	. –	-
01SOS1	Software Seminar 1	Z	2
	embly language programming for microprocessors Intel 80x86	-	-
01SOS2	Software Seminar 2	Z	2
	+ and Qt. Development of graphical user interface using C and C++ programming languages. Portable applications for Unix	-	-
	ability to Microsoft Windows.	5 .,	· · · · · · · · · · · · · · · · · · ·
02SPRA1	Special Practicum 1	KZ	6
	focused on instrumental techniques that are mainly used in physics and technical professions. Topics of each parts are chose		-
with advanced pats of e	experimental physics and metrology.		
02SPRA2	Special Practicum 2	KZ	6
Physics measurement	focused on instrumental techniques that are mainly used in physics and technical professions. Topics of each parts are chose	en so that student	s can familiarize
with advanced pats of e	experimental physics and metrology.		
01STR	Statistical Decision Theory	ZK	2
The subject is devoted	to the statistical techniques for general decision procedures based on optimization of suitable stochastic criterion, their mutua	l comparisons wit	h respect to their
properties and applicat	ility.		
11SFBM	Structure and Function of Biomolecules	Z,ZK	3
e e	plecular structure is crucial for the understanding of its function. The subject is focused on the introduction to building blocks of	macromolecules,	overall structure
	n relationship including macromolecular complexes.		1
04SM1	Spanish for Intermediate Students M1	Z	1
-	for students whose competence is at level B1 of CEFR, i.e. those who studied Spanish in the secondary school. The 3-semi		-
	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		1.
04SM2	Spanish for Intermediate Students M3 ie students´ knowledge from the previous course (SM1). Students are gradually acquainted with fundamentals of Spanish for		
	alized texts on the Internet.	specific purposes	
04SM3	Spanish for Intermediate Students M3	Z	1
	upplemented with additional subtechnical materials, so the students will be gradually acquainted with the peculiarities of acac	1	-
	net in Spanish and search for information of their specialization or field of interest. Students will use the information to write s		
-	nme, general Spanish course based on course books, covers presentations and, finally, a written and oral examination.		
04SP1	Spanish for Advanced Students P1	Z	1
Course concentrates or	n more difficult grammar topics, revision of vocabulary, basics of Spanish for specific purposes as well as written communicat		quisites: level B2
of CEFR.			
04SP2	Spanish for Advanced Students P2	Z	1
Course SP2 is the seco	nd part of the advanced Spanish course, extending Spanish for specific purposes topics. It comprises more grammar and sy	ntax and focuses	on independent
written communication.			
04SP3	Spanish for Advanced Students P3	Z	1
	al 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
	s will need in their career.		
04SZ1	Spanish for Beginners Z1	Z	1
	st stage of the five-semester programme of Spanish studies; during the first stage the students will master phonetics and fun	-	
	icate at an elementary level on topics of everyday life. They will acquire and extend fundamental vocabulary of general Spani	_	
04SZ2	Spanish for Beginners Students Z2	Z	1
	I on course 04SZ1, and expects students to develop and extend the knowledge and skills acquired so far. Grammar structure		
	rstand short adapted written texts and speech. Attention is also paid to cultural differences between Spanish-speaking count Inish-speaking countries are also included.	nes and others su	ion as the Uzech
04SZ3		Z	1
	Spanish for Beginners Z3 course SZ2, and develops the student's vocabulary and grammar structure. The course covers realia (history and culture) c		-
	attention to further grammar topics (pretérito perfecto, pretérito indefinido, pretérito imperfecto, the gerund and the imperativ		-
	ven general topic, for which the student is trained by reading texts or listening to them.	,	

04SZ4	Spanish for Beginners Z3	Z	1		
	course SZ3. It develops the student's vocabulary and extends the knowledge of the culture and social customs of the Spani	. – .	tries, mainly of		
	o further grammar topics (perifrasis verbales, futuro imperfecto, direct object and indirect object pronouns, negative form of		-		
to written and oral communication on a given general or subtechnical topic, for which the student is trained by reading texts or listening to them.					
04SZ5	Spanish for Beginners Z5	Z	1		
The course books are s	upplemented with additional subtechnical materials, so the students will be gradually acquainted with peculiarities of Spanis	h for specific purp	oses. In its final		
part, the general Spanis	h course based on the course book will end with presentations and, finally, a written and oral examination.				
14TM	Engineering Mechanics	Z,ZK	4		
	a link-up between the theoretical mechanics of rigid bodies and engineering disciplines dealing with the stress and strain and	-			
14TEM	Engineering Mechanics	Z,ZK	6		
	presents a link-up between the theoretical mechanics of rigid bodies and engineering disciplines dealing with stress and stra	in analysis of real	structure parts		
	ture mechanics, etc.). Principles of statics, kinematics, and dynamics and their application.	71/	2		
12TAIS Broduction and forming	Ion Beam Techniques and Applications. of ion beam, charged particle optics, interaction of ion with solid matter, technological and analytical applications.	ZK	3		
TV-1		Z	1		
	Physical Education		•		
TV-2	Physical Education	Z	1		
TV-3	Physical education	Z	1		
TV-4	Physical education	Z	1		
02TEF1	Theoretical Physics 1	Z,ZK	4		
	ction to analytical mechanics. The students acquire knowledge of the basic concepts of the Lagrange and Hamiltonian formal				
	cs (Newton's, Lagrange, Hamilton and Hamilton-Jacobi equations). The efficiency of these methods is illustrated on element		-		
•	a system of constrained mass points, and of a rigid body. Advanced parts of the course cover differential and integral principl se of classicaltheoretical physics (02TEF1, 02TEF2).	les of mechanics.	i ne subject is		
02TEF2		Z.ZK	4		
	Theoretical Physics 2 tions in physics. Mechanics of point mass, rigid body and continuum. The special theory of relativity: relativistic mechanics are	· · ·			
	Classical electrodynamics: Maxwell's equations in the Minkowski space-time, electromagnetic waves in dielectric media, elec		-		
approximation.		a omagnetic radia			
01DYSY	Theory of Dynamic Systems	ZK	3		
	introduction to system theory with emphasis on control theory and understanding of the fundamental concepts of systems a	1	-		
-	the dynamical behavior of systems as well as provide the necessary mathematical background. Internal and external system	-			
	riable, impulse response and transfer function, polynomial matrix, and fractional representations. Stability, controllability, obs				
-	asis always being on fundamental results. State feedback, state estimation, and eigenvalue assignment are discussed in detail	-			
are also parameterized	using polynomial and fractional system representations. The emphasis in this primer is on linear time-invariant systems, both	h continuous and o	discrete time.		
01TKO	Theory of Codes	ZK	2		
Algebraic methods used	I in error detecting and error correcting codes.	1			
02TER	Heat and Molecular Physics	Z,ZK	4		
Thermal expansion of m	aterials, heat transfer; stationary and non-stationary heat conduction, heat transfer and penetration; 1st and 2nd thermodyn	amic principle, ide	al and real gas,		
entropy; non-chemical s	ystems: dielectric and magnetic materials; Maxwell relations and thermodynamic potentials; kinetic theory: Maxwell's velocity	distribution, equip	artition theorem.		
02TSFA	Thermodynamics and Statistical Physics	Z,ZK	4		
Foundation of thermody	namics and statistical physics. Thermodynamic potential, the Joule Thomson effect, conditions of equilibrium, the Braun-Le Ch	atelier principle. S	tatistical entropy.		
	scriptionfrom a statistical point of view (classical and quasiclassical regime within the frame of a canonical and grand-canon	ical ensemble, Fe	rmi gas, models		
	body radiation). The Boltzmann equation is usedto discusses simple transport phenomena.				
01TOP	Topology	ZK	2		
	systematization and deepening the knowledge of general topology.				
16MCRB	Transport of Ionizing Radiation and Monte Carlo Method	Z,ZK	4		
	s of Monte Carlo method and its use for radiation transport simulation, selected concepts of probability theory and mathematical sector of the	-			
-	pes of radiation and their use for stochastic modeling of their substance transport. Model description concepts, geometric m	-	-		
-	of measured variables and parameters. Statistical evaluation of reliability of modeling results, variance reduction methods, pro	-			
	NP program, its possibilities and use. Procedures for the practical use of the program for typical tasks in the field of dosimetr systems, radiation protection and medical applications.	y, application of ic	nizing radiation,		
01DYK		Z	2		
	Introduction to Continuum Dynamics action to the mathematical description of continuum dynamics. It summarizes the necessary mathematical apparatus with er	. – .			
	ns, and integration on manifolds. It includes the basic concepts of continuum mechanics such as strain and stress tensors of	-			
	derive the fundamental laws of conservation of mass, momentum, angular momentum, and energy in integral and differential				
	are adapted to the case of viscous and inviscid fluid and linear and nonlinear elastic body.	·	,		
16ZIVB	Introduction to Ecology	KZ	2		
	t basic of the ecologic principles, terms and ideas. It covers overview information regarding to particular components of the er	1 1			
indicators and sustainat	ble development.				
02UFEC	Introduction to Elementary Particle Physics	Z	2		
The course provides an	easily accessible introduction to elementary particle physics. Development, methods, goals and perspectives of the subject	are presented.			
11UFPLN	Introduction to Solid State Physics	ZK	2		
The purpose of this lect	ure is to introduce the undergraduate students to the study of the solid state physics.	·			
17UINZ	Introduction to Engineering	Z,ZK	3		
The course is devoted to	o an introduction to the engineering profession. Students will gradually learn the characteristics and specialties of engineerin	ng work, including	an overview of		
the basics of selected e	ngineering disciplines, such as the basics of materials science, manufacturing technology, quality control and assurance and	d ecology. Further,	the course will		
focus on some issues o	f R&D activities organization and on selected parts of technical drawings and the work with AutoCAD code.				
02UKP	Introduction to Curves and Surfaces	Z	2		
-	s an introduction to the differential geometry of simple manifolds - curves and two-dimensional surfaces. The basic concepts				
	olained. In the surface theory we introduce first and second fundamental forms and mean and Gaussian curvature. Essential p	part of the lecture a	are the examples		
calculated by students					
12ULT	Introduction to Laser Technique	Z,ZK	3		
Overview of electromag	netic radiation sources; laser principle; classification of lasers; characterization and rough application of various types of lase	ers; laser safety pr	ecautions.		

12UMF	Introduction to Modern Physics	Z	3
	o be a concise introduction to modern / nonclassical physics for students who have already had basic classical physics cours	e. A part of the co	urse is delivered
in a computational labor	atory.		
18UOA	Introduction into Object Oriented Architecture	Z,ZK	4
01UTIZ	Introduction to Theoretical Informatics	ZK	2
11UVOD	Introduction to Specialization	Z	2
The purpose of this lect	ure is to introduce the undergraduate students to the physical master degree study programmes.	'	
12VAK	Vacuum Physics and Technology	KZ	4
	concepts and relations; flow of rarefied gas. Interaction of gas with surface of solid surface; sorption, desorption; evaporation,		
	cuum generation. Pumping process. Pumps. Vacuum measurements: vacuum gauges of total and partial pressure; pumping	speed; gas flow, c	conductivity,
searching for leaks. Mat	erials and vacuum instalation parts. Practical exercises.		
12PYTH	Scientific Programming in Python	Z	2
	s to learn the fundamentals of the modern Python programming language with a focus on scientific computing. Emphasis is p		
-	performed in an interactive form of practical exercises, whose topics can be tailored to the content of other subjects or stude		
	earch. In the introductory part of the course, students learn the basic features of Python?from basic types to object oriented c		
	e focuses on specific features of Python for scientific programming. Presented are the main numerical libraries NumPy, SciP	'y and the Matplot	tlib graphics
-	generate efficient code, how to combine Python with other languages, what tools are available.	,	
12VTV	Scientific and Technical Computing	Z	2
-	r with methods of solving of computational problems in the scientific and technical practice, and with methods of their progra	mming. The cours	se is oriented
mainly to programming			
12VFT	High Frequency and Impulse Circuitry	Z,ZK	2
	o collect advanced knowledge in high frequency technics and high speed events. The course is focused on Maxwell equation	solution, Gunn's	diodes, high
	rowaves guidelines, striplines, oscillators, amplifiers and pulse generators.		
17VYR	Research Reactors	ZK	2
	earch reactors and their applications for the need of research and industry. Students get familiar with research reactor types a	-	ental programme
	equipment needed for particular applications and their specifics. The course is supported by technical visit to research react	· · · · · · · · · · · · · · · · · · ·	
12EPR1	Basic Electronics Practicum 1	KZ	3
-	n is 1) to acquire basics skills in electronics and 2) to learn independent problem solving, formulation of a task and formulation	on of the results. T	he practicum
consists of blocks lasting			
12EPR2	Basic Electronics Practicum 2	KZ	3
-	n is 1) to acquire basics skills in electronics and 2) to learn independent problem solving, formulation of a task and formulation	on of the results. T	he practicum
consists of blocks lasting			
12ZPLT	Basic Laser Technique Laboratory	KZ	6
	AG laser, laser crystal, laser discharge lamp, laser cavity, resonator, free-running, Q-switching, laser amplifier. second harmo		lischarges, laser
	d: YAG laser, CO2 laser marking, laser materials properties, non-linear transmission, laser beam transverse profile, acousto-	· · · · · · · · · · · · · · · · · · ·	
12ZPOP	Basic Optical Laboratory	KZ	6
	es give advanced practical skills by experimental work in optics and optoelectronics. Laboratory records must be elaborated.		
16AMMB	Fundamentals of Analytical Measurement Methods	ZK	2
	al performance and utilization of methods of chemical analysis. Basic methodology of analytical determination, gravimetry, ti		-
	etry, polarimetry, UV-VIS spectroscopy, atomic emission and absorption spectroscopy, infrared and Raman spectroscopy, X-i	ay structural anal	lysis, nuclear
	pin resonance, mass spectrometry, thermometric methods, gas and liquid chromatography.		
16ZBAF1	Fundamentals of Human Biology, Anatomy and Physiology 1	Z,ZK	4
	stems, non-cellular and cellular organisms, prokaryotic and eukaryotic cell. Molecular and cell biology. Biopolymers. Molecular and the second provide and the s	-	-
-	human anatomy. Basics of medical terminology. Overview of tissues. Skeleton. Muscle anatomy in general. Digestive system	n and its physiolog	gy. Respiratory
	of respiration. Excretory and genital tract.	771	4
16ZBAF2	Fundamentals of Human Biology, Anatomy and Physiology 2	Z,ZK	4
	cardiac activity. General anatomy of blood vessels, main arteries of the body, overview of veins and physiology of blood,	-	lew of nerves.
-	physiology of the visual system. Auditory and vestibular system and physiology of hearing and balance. Skin, endocrine gla		4
16ZDOZ1	Fundamentals of Radiation Dosimetry 1	Z,ZK	4
	nd objectives of dosimetry. Quantities and units used for description of sources, fields, interactions of ionizing radiation, ionization, ioniz	ations, energy trai	nster and
	als of the effects of ionizing radiation.	71/	2
16ZDOZ2	Fundamentals of Radiation Dosimetry 2	ZK	2
-	cal effects of ionizing radiation. Quantities and units used in radiation protection. Recommendations of ICRP and ICRU. Principl tion of activity and neutron source emission. Measurements of absorbed dose and exposure.	es and methods o	measurements
		71/	2
17ZEH	Basics of Economic Assessment	ZK	2
	the economic evaluation of Nuclear power plants. Introductory lectures are concerned with an introduction to economy and th es continued with insight into the business and managerial economics, explanation of the concepts of incomes, expenses, etc.		
	ation. Second part of lectures is focused on evaluation of nuclear power plants - the fuel cycle and operations of NPP.		
17ZEL	Basics of Electronics	KZ	3
	nformation of electronics. In the beginning, lectures are devoted to passive components - resistors, capacitors, inductors and	I I	
	al with semiconductor components (standard, Zener, capacitive, LED), bipolar, unipolar transistors and semiconductor components		
	tinue with general amplifiers and operational amplifiers. Finally, lectures deal with digital circuits, digital/analog and analog/d		
completed with electron		ignal contentent	
12ZEL1	Basic Electronics 1	Z,ZK	3
	mary knowledge of circuit theory concerning principles of electronic circuits in both stationary and harmonic stable state. Cir	I ' I	-
	and complex method are explained. Proper circuit analysis is also lectured. The subject's final part deals with transient effect	-	
12ZEL2	Basic Electronics 2	Z,ZK	3
	vith the Basic Electronics 1. Semiconductor elements basic properties are explained. Thecourse's final part deals with basic t	I ' I	
02ZFM1	Foundations of Physical Measurements 1	Z	2
	for students of physical specializations (Experimental particle physics, Physical engineering, Nuclear engineering), however,	-	
-	al of the lecture is to introduce the basics of physical measurements, the methods of processing and evaluation of acquired da		-
basic habits of work in a			

		·	
02ZFM2	Foundations of Physical Measurements 2	Z	2
This introductory course	e is devoted to the essentials of measurements of the most important physical quantities. It is especially recommended to the	se students who ar	e going to study
one of the physicas curr	icula - Physical engineering and Nuclear engineering. Also the methods of evaluation of statistical data using PC and practic	al work with measu	urement devices
is involved. Students lea	arn main rules connected with experimental work in physical laboratory.		
11ZFPL	Basic to Solid State Physics	KZ	2
Description of fundame	ntal properties of solids following the regular long distance ordering of atoms in a crystal lattice. Based on the introduced bor	nding interaction be	etween atoms in
solids, various types of o	rrystals and their properties are defined. The model of crystalline lattice dynamics in harmonic approximation is described and l	basic thermal prop	erties of crystals
are derived. The periodi	c potential of the crystal lattice is introduced and its relation to the following model describing the energetic state of electrons	s in solids by mear	ns of electron
energy bands explained	I. The special consequences of band approach to the physical properties of solids are elucidated. The aim of the course is to	systematically inter-	roduce and
interpret a broad pheno	menological basis of physical properties of crystalline solids		
12ZFP	Principles of Plasma Physics	Z,ZK	4
Basic physics of high te	mperature plasmas is explained using particle, kinetic and fluid approaches. It includes drift motions and adiabatic invariants,	, linear theory of w	aves in plasmas
and propagation of elec	tromagnetic waves in inhomogeneous plasmas. Basic non-linear effects, such as ponderomotive force, self-focusing and par	rametric instabilitie	s are explained.
It comprises brief introd	uction into magnetohydrodynamics and nuclear fusion. Basics of atomic physics od multiply-ionized plasmas are introduced.		
02ZJF	Nuclear Physics	Z,ZK	6
This scientific field pres	ents formidable challenges both experimentally and theoretically, simply because we are dealing with the submicroscopic do	main, where much	of our classical
intuition regarding the b	ehaviour of objects fails us. The lecture is a basic introduction to very interesting regions of subatomic physics.		
02ZJFB	Nuclear Physics B	KZ	3
This scientific field pres	ents formidable challenges both experimentally and theoretically, simply because we are dealing with the submicroscopic do	main, where much	of our classical
intuition regarding the b	ehaviour of objects fails us. The lecture is a basic introduction to very interesting regions of subatomic physics.		
15ZKJE	Nuclear Power Plants Design and Operation	ZK	3
	ate basic knowledge of physics of nuclear reactors utilizing fission. Further explains arrangement of nuclear fuel, purpose, tech	1 1	-
-	onstruction of all components are defined wit regard to nuclear physics, physics of shielding, theory of regulation, material sci	-	
	vledge for evaluation of nuclear safety and radiation protection in nuclear energy, reliability and economy for comparison with		
-	tegic importancy of nuclear sources of energy. Gives basic knowledge of construction, operation and decommissioning of nuc		
	and spent fuel and their management.	•	
16MEZB	Fundamentals of Ionizing-Radiation Metrology	Z,ZK	4
	the basic objectives and content of ionizing radiation metrology. It deals with the interpretation of radiation quantities and un	1 / 1	-
	ental foundations of metrology, the determination of basic parameters of radiation. Lectures are supplemented with basic su		
regulations.		,	0
01ZOS	Introduction to Operating Systems	Z	2
	of operating systems. Processes, thread, memory management. Synchronization of multi=threaded applications. Memory m	1 1	-
12ZAOP	Fundamentals of Optics	Z,ZK	2
	rery basics of optics - electromagnetic theory, linear optical physics and material effects, basics of nonlinear effects, and geo		_
	on the bachelor level, broad and general information on optics, giving an essential orientation in the field, especially with resp	-	-
	re further elaborated during departmental masters program. The lecture stems from the electrodynamic notion of plane wave	-	
	n material medium. It explains basics of linear and nonlinear response in material medium and dispersion properties. It next		
,.	plains processes induced by boundary conditions at interfaces. It also discusses the consequences of statistics on interferen		
	and their applications in interferometers. Based on the Fresnel diffraction integral, diffraction processes are presented in a grap		
	sed on this diffraction principle, basic functioning of holography is clarified. Finally, the lecture unravels the geometrical optics		-
	stitutive schema of a paraxial imaging system, and optical aberrations. It shows fundamentals of imaging in optical instrumen		5
01ZPB1	Introduction to Computer Security 1	Z	2
16ZPSP	Basic Work with PC	7	2
	basic work with PC	<u> </u>	on systems and
	The CTU in Prague and the FNSPE. Emphasis is placed on effective handling of work with office productivity software (text ed		-
	in MS Office. The practical content focuses mainly on further use during studies (laboratory reports, research work, bachelo		· ·
	als, state administration, companies). Other sections summarize basic information about computer hardware, software, and si	-	
	rticipation in exercises above 60% is a necessary condition for passing the course.	boundy. Completion	i or independent
16ZRAO	Basics of Radiation Protection	Z	2
	to familiarize students with the general principles of radiation protection. The main emphasis is put on basic mechanisms and	1 1	
	The course provides answers to the cardinal questions: What is ionizing radiation (IR), where it comes from, whether and how	-	
	tive units (Gray, Sievert), how to prevent malicious effect of IR and many others. The content of the lectures does not require	-	
			2 2
02ZSM	Introduction to the Standard Model	ZK	
-	ons, baryons, mesons, symmetry, symmetry group, quarks, gluons, partons, standard model of electroweak and strong intera	ionona, quantum c	momouynamics
(QCD), cross section, s	-	71/	
16ZEDB	Basics of Experimantal Data Processing	ZK	2
	perimental data; univariate data; calibration; regression; multivariate data.	, . ,	
14ZZKS	Testing and Processing of Metals and Alloys	KZ	4
	hardness, impact toughness, technological testing, fatigue testing, creep testing. Light microscopy, preparation of specimens		
	g, soldering, brazing, powder metallurgy, mechanical machining. Copper alloys, aluminium alloys, titanium alloys, special allo	ys of non-ferrous n	netals. Technical
drawing and CAD.			

List of courses of this pass:

Code	Name of the course	Completion	Credits
00EKOT	Economy in Technology	Z	1
	The course introduces the basics of micro- and macroeconomics.		

00ETV	Ethics of Science and Technology	Z	1
00MAM1	Essentials of High School Course 1	Z	1
00MAM2	Essentials of High School Math Course 2	Z	1
	Review of basics of high school mathematics.		
00PT	Preparatory Week	Z	2
00RET	Rhetoric	Z	1
	used on the acquisition of speech and voice techniques and on the rules of correct pronounciation. The course is also devoted to the		
	nonverbal aspects. Stylistics exercises, strategies for coping with stage-fright and a short excursion into the history of rhetoric are an		1 .
00UPRA	Introduction to Law	Z	1
00UPSY	Introduction to Psychology	Z	1
01ALG After an introduction	Algebra on into the set theory standard algebraic structures are dealt with: groups, rings, fields, modules, linear algebras, lattices, Boolean alge	ZK bras, rings of poly	4 // 4
	commutative fields.	Z,ZK	
01ALGE	Algebra axioms are treated in detail. Elements of the set theory cover only: equivalence and subvalence, the Cantorov-Bernstein theorem, the a		6
-	ition of ordinals and cardinals. Further standard algebraic structures are addressed: semigroups, monoids, groups, rings, integral dom fields, lattices. Independent chapters are devoted to divisibility in integral domains and to finite fields.		
01DEM	History of Mathematics	Z	1
he subject has th	e form of regular seminars where the members of the department of mathematics, but also invited speakers - specialists in the field - g from the history of mathematics.	ive their talks on	aroius topio
01DIM1	Discrete Mathematics 1	Z	2
	The seminar is devoted to elementary number theory and applications. It includes individual problem solving.		
01DIM2	Discrete Mathematics 2	Z	2
	The seminar is devoted to recurrence relations. It includes individual problem solving.	1	
01DIM3	Discrete Mathematics 3	Z	2
The subject is dev	voted to elementary proofs of non-trivial combinatoriwal identities and to generating functions and their applications. In the seminar stu	udents present a	problem wit
	solution chosen from the given literature.		-
01DYK	Introduction to Continuum Dynamics	Z	2
	in introduction to the mathematical description of continuum dynamics. It summarizes the necessary mathematical apparatus with em ial forms, and integration on manifolds. It includes the basic concepts of continuum mechanics such as strain and stress tensors or su	-	
	ble to derive the fundamental laws of conservation of mass, momentum, angular momentum, and energy in integral and differential forr		
which it is possi	bic to derive the fundamental laws of conservation of mass, momentally, angular momentally, and energy in integral and differential for	n. In the last part	
	these conservation laws are adapted to the case of viscous and inviscid fluid and linear and nonlinear elastic body.		
up the understan	these conservation laws are adapted to the case of viscous and inviscid fluid and linear and nonlinear elastic body. Theory of Dynamic Systems des an introduction to system theory with emphasis on control theory and understanding of the fundamental concepts of systems and ding of the dynamical behavior of systems as well as provide the necessary mathematical background. Internal and external system	descriptions are o	described in
The course provid up the understan detail, including explained with the	Theory of Dynamic Systems des an introduction to system theory with emphasis on control theory and understanding of the fundamental concepts of systems and ading of the dynamical behavior of systems as well as provide the necessary mathematical background. Internal and external system state variable, impulse response and transfer function, polynomial matrix, and fractional representations. Stability, controllability, obse emphasis always being on fundamental results. State feedback, state estimation, and eigenvalue assignment are discussed in detail. All	d control theory. F descriptions are o rvability, and real stabilizing feedba	rst, we build described in zations are ck controlle
The course provid up the understan detail, including explained with the are also paramet	Theory of Dynamic Systems des an introduction to system theory with emphasis on control theory and understanding of the fundamental concepts of systems and riding of the dynamical behavior of systems as well as provide the necessary mathematical background. Internal and external system state variable, impulse response and transfer function, polynomial matrix, and fractional representations. Stability, controllability, obse emphasis always being on fundamental results. State feedback, state estimation, and eigenvalue assignment are discussed in detail. All terized using polynomial and fractional system representations. The emphasis in this primer is on linear time-invariant systems, both of	d control theory. F descriptions are o rvability, and real stabilizing feedba continuous and di	rst, we build described in zations are ck controlle screte time.
The course provid up the understan detail, including explained with the are also paramet 01FA1	Theory of Dynamic Systems des an introduction to system theory with emphasis on control theory and understanding of the fundamental concepts of systems and inding of the dynamical behavior of systems as well as provide the necessary mathematical background. Internal and external system state variable, impulse response and transfer function, polynomial matrix, and fractional representations. Stability, controllability, obse emphasis always being on fundamental results. State feedback, state estimation, and eigenvalue assignment are discussed in detail. All terized using polynomial and fractional system representations. The emphasis in this primer is on linear time-invariant systems, both on Functional Analysis 1	d control theory. F descriptions are o rvability, and real stabilizing feedba continuous and di Z,ZK	rst, we build described in zations are ck controlle screte time. 3
The course provid up the understan detail, including explained with the are also paramet 01FA1	Theory of Dynamic Systems des an introduction to system theory with emphasis on control theory and understanding of the fundamental concepts of systems and ading of the dynamical behavior of systems as well as provide the necessary mathematical background. Internal and external system state variable, impulse response and transfer function, polynomial matrix, and fractional representations. Stability, controllability, obse emphasis always being on fundamental results. State feedback, state estimation, and eigenvalue assignment are discussed in detail. All terized using polynomial and fractional system representations. The emphasis in this primer is on linear time-invariant systems, both of Functional Analysis 1 of mathematical analysis and algebra introduction to the basics of functional analysis. There are the concepts that students need to u	d control theory. F descriptions are o rvability, and real stabilizing feedba continuous and di Z,ZK	rst, we build described in zations are ck controlle screte time. 3
The course provid up the understan detail, including explained with the are also paramet 01FA1 Continuing course	Theory of Dynamic Systems des an introduction to system theory with emphasis on control theory and understanding of the fundamental concepts of systems and iding of the dynamical behavior of systems as well as provide the necessary mathematical background. Internal and external system state variable, impulse response and transfer function, polynomial matrix, and fractional representations. Stability, controllability, obse emphasis always being on fundamental results. State feedback, state estimation, and eigenvalue assignment are discussed in detail. All terized using polynomial and fractional system representations. The emphasis in this primer is on linear time-invariant systems, both o Functional Analysis 1 of mathematical analysis and algebra introduction to the basics of functional analysis. There are the concepts that students need to u and technical disciplines.	d control theory. F descriptions are d rvability, and real stabilizing feedba continuous and di Z,ZK inderstand the var	rst, we build lescribed in zations are ck controlle screte time. 3 ious physic
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01LIPB	Linear Programming B	Z,ZK	4
The aim of the lect	ure is the exact mathematical formulation of simplex algorithm for the linear programming problem. In exact mathematical language problem. As aplications, traffic problem, integer programming and example from the game theory are studied.	e we study primary	and dual
01LNA1	Linear Algebra 1 The subject summarizes the most important notions and theorems related to the study of vector spaces.	Z	2
01MA1	Calculus 1 Basic course of real analysis (functions of one real variable, differential calculus).	Z	4
01MAB2	Calculus B2	Z,ZK	7
01MAB3	Basic calculus (real analysis, indefinite and definite integrals and series). Calculus B3	Z,ZK	7
	d to functional sequences and series, theory of ordinary differential equations, theory of quadratic forms and surfaces, and general th and prehilbert?s spaces.		1 -
01MAB4	Calculus B4	Z,ZK	7
1	ted properties of functions of several variables, differential and integral calculus. Furthermore, the measure theory and theory of Li		1
01MAN	Calculus 1 Basic calculus (real analysis, functions of one real variable, differential calculus).	Z	4
01MANB	Calculus B 1, Examination Examination of knowledge about stuff lectured in the 01MAN course.	ZK	4
01MAPR	Markov processes	Z,ZK	4
01MAPK 01MASC	Mathematical Statistics - Seminar	<u>, 2, 2 (</u> \ 7	4
	ed to practical use of statistical methods studied in the course Mathematical Statistics 01MAS. The tutorial deals with calculation o	∠ f Fisher informatio	-
statistical models, find	ding unbiased estimators with minimal variance, parameter estimation by method of moments and method of maximum likelihood, on the strain of the Neyman-Pearson lemma and likelihood ratio, calculation of confidence intervals and non-parametric densition of the strain of the Neyman-Pearson lemma and likelihood ratio, calculation of confidence intervals and non-parametric densition of the strain of the Neyman-Pearson lemma and likelihood ratio, calculation of confidence intervals and non-parametric densition of the strain of the st	derivation of critica	
01MAZ	Calculus 1, Examination	ZK	4
01MMF	Methods of Mathematical Physics	Z,ZK	6
The course provides a	an introduction to the theory of distributions with applications to solutions of partial differential equations with constant coefficients, f case of a continuous kernel on a compact set as well as Sturm-Liouville operators on bounded intervals, and applications of the s to the solution of some boundary value problems and mixed problems.	urther the Fredhol	m theorems
01MMPV	Mathematical Models of Groundwater Flow	KZ	2
-	es an overview of computational methods for selected groundwater flow problems. The first part of the course is devoted to mathem problems. The second part is aimed at selected numerical methods, emphasizing implementation issues related to these meth	natical formulation	1
01NME2	Numerical Methods 2	KZ	2
The course is devoted	I to numerical solution of boundary-value problems and intial-boundary-value problems for ordinary and partial differential equations. ry-value problems to initial-value problems and finite-difference methods for elliptic, parabolic and first-order hyperbolic partial differ Programming of Peripherals Devices	It explains method	s converting
Memory orga	anization, input and output ports, computer bus. Software libraries for computer peripherals, 3D graphic libraries. Principles of perip	_	ers.
01POGR1	Computer Graphics 1 ro-semester "Computer Graphics" course is devoted to the specifics of digital display devices spanning from history up to the state o	ے f the art technoloc	2
a survey of fundament	tal problems in 2D computer graphics is given together with their solutions. Focus is put on mathematical description of problems and ex weldge previously obtained in a variety of subjects available at FNSPE. The final part of the course covers the applications of com the process of authoring scientific documents and presentations.	planation of the co	orresponding
01POGR2	Computer Graphics 2	Z	2
	he two-semester "Computer Graphics" course begins with a brief introduction to signal theory in the context of aliasing - a phenom well structured survey of fundamental problems in 3D computer graphics is given together with their solutions, from the description		
rendering. Focus is pu	ut on mathematical description of problems and explanation of the corresponding algorithms using knowledge previously obtained in thm implementation aspect such as data structures design etc. is also a matter of concern. In the last lecture, a number of theoretic	a variety of subje	cts available
	using Blender, an open-source 3D modeling and rendering software instrument.		
01POPJ1	Computers and Natural Language 1	Z	2
	putational processing and understanding of natural languages. Automatic methods of morphological and syntactic analysis includir ambiguation will be discussed. Two-level morphology, tagging and language models, Viterbi algorithm, grammars, chart parsing, pro-	-	
01POPJ2	Computers and Natural Language 2	Z	2
-	se is to get acquainted with the broad topic of machine translation (MT). Machine translation is a challenging task that can serve as plex as natural languages. We cover several rather different approaches to the task as well as issues related to automatic and man quality.		-
01POPR	Advanced Probability	Z	2
The subject is devo	oted to advanced Theory of probability and statistics on measure-theoretic level for general distributions of random variables. We de andom variables and convergence criteria. Further, the theory of statistical model estimation and testing is extended for parametric	-	-
01PRA1	Probability and Mathematical Statistics 1	Z,ZK	6
The subject is devot	ted to the introduction to Theory of probability and statistics on measure-theoretic level for discrete models, continuous distributions e deal with sample an integral characteristics of random variables and variants of limit theorems are derived (LLN, CLT). This know statistical processing of observations and statistical parametric model estimation.	and general distr	ibutions of
01PRA2	Probability and Mathematical Statistics 2	ZK	2
	t to the statistical techniques for estimation and testing within parametric and nonparametric models such as Maximum likelihood prin		1
-	s of fitness tests of models, confidence regions, etc. We focus on real practical applications of these statistical techniques in frame		-
01PRST	Probability and Statistics	Z,ZK	4
	f probability theory and mathematical statistics. The probability theory is build gradually beginning with the classical definition and	-	-
	s as random variable, distribution function of random variable and characteristics of random variable are treated and basic limit the pasis of this theory the basic methods of mathematical statistics such as estimation of distribution parameters and hypothesis testir		and proved.

ability and Statistics B		KZ	4
robability theory is build gradually beginning with the classical definition a	e of probability theory and mathematical statis	nd continuing till the K	olmogor
variable and characteristics of random variable are treated and basic limit	ons as random variable, distribution function	theorems are stated a	ind prove
I statistics such as estimation of distribution parameters and hypothesis t	e basis of this theory the basic methods of ma	sting are explained.	
- Publication Instrument		Z	2
nd facilities of computer typography, particularly to the system LaTeX	The course is devoted to the	· – ·	-
		Z	2
ndows Programming rols. File input and output. User defined components, dynamic type identi	arophical programs for MS Windows Basis a		2
ons of Mathematical Physics		Z,ZK	6
d functions, classification of partial differential equations, theory of integr		Il transformations, and	solutior
value problem for eliptic PDE, mixed boundary problem for eliptic PDE).	partial differential equations		
agement of Software Projects	Proj	KZ	2
anation of general ideas, rules and procedures which are common to many	management of software projects is dedicated	projects of very divers	e charac
nany other aspects which have to be taken into account in the course of the	re corresponds to a lifecycle of typical projects	ir management. Speci	fic attent
projects in general. Interdisciplinary view of project management is emp	is paid to software project managemer	asized.	
mputer Networks 1		Z	2
les and technologies). Architecture of reference model ISO/OSI. Network	i history and present network (LAN_WAN_use	1 – 1	_
re communication, tunneling. Directory services, certificates, certification a			
, gateways, NAT, DMZ), practical exercises. (According to the interest - th			
mputer Networks 2		Z	. 2
les and technologies). Architecture of reference model ISO/OSI. Network			
re communication, tunneling. Directory services, certificates, certification a		· · · · ·	
, gateways, NAT, DMZ), practical exercises. (According to the interest - th	actice. Network security - firewalls (packet filte		
ninar on Calculus B1		Z	2
levoted to support the lectures of Calculus B3.	The		
ninar on Calculus B2		Z	2
devoted to support the lectures of Calculus B4.	The	I – I	_
oftware Seminar 1		Z	2
			2
ly language programming for microprocessors Intel 80x86			
oftware Seminar 2		Z	2
using C and C++ programming languages. Portable applications for Unix	GTK+ and Qt. Development of graphical user	ke operating systems	, especia
systems. Portability to Microsoft Windows.			
systems. Portability to Microsoft Windows.	Sen	Z	2
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02FYS2	Physical Seminar 2	Z	2
	levoted to detailed study of interesting physical problems. It should help students to deeper understanding of fundamentals of physical d Magnetism. The problems are chosen studied and presented by the students themselves, with the possibility to use PC and physical	-	
02FYZ1	Physics 1	Z,ZK	3
	and applications of mechanics, waves and thermodynamics ? basic level. The lecture is supplemented with practical investigation and	,	-
	physical phenomena		-
02FYZ2	Physics 2	Z,ZK	3
02KF	nics, electricity and magnetism, modern physics. The lecture is supplemented with practical investigation and demonstration of select Quantum Physics	Z,ZK	3
	n, wave function, postulates of quantum mechanics, Born s statistical interpretation, expectation values, Schrödinger equation, Heise		1
	quantization of angular momentum, solution of simple systems, hydrogen atom.		
02LCF1	Experimental Laboratory 1	Z	2
02LCF2	Cavendish experiment. Elasticity.Thermal capacities. Electric measurements, Acoustic. Oscillations.	Z	2
UZLOFZ	Experimental Laboratory 2 Electric and magnetic field, microwaves, Xray and gamma rays, geometric optics	Ζ.	2
02NSAD	Simulations and Data Analysis Tools	Z	2
	Data analysis and simulations of high energy elementary particle collisions. ROOT and Pythia programs.		
02OR	General Relativity	ZK	3
Introduction to ger	neral theory of relativity: principle of equivalence and principle of general covariance, parallel transport and geodesic equation, gravita Einstein's gravitational law. Schwarzschild solution of the Einstein equations, homogeneous and isotropic cosmological mode		rvature and
02PRA1	Experimental Laboratory 1	KZ	6
	d especially for students who intend to study some of the physical specializations of FNSPE(branch Physical Engineering, Nuclear Ei	1	-
attended by student	ts interested in the otherspecializations. In Experimental laboratory students learn how to prepare for experiments (including work with the	eliterature), the imp	plementation
of the measuremer	nt (acquire of different experimental procedures and routines), willteach writing the records of measurement, processing and evaluation	on of results. At the	e same time
02PRA2	practically extend the knowledge gained in lectures on physics. Experimental Laboratory 2	KZ	6
	d especially for students who intend to study some of the physical specializations of FNSPE(branch Physical Engineering, Nuclear Ei		-
	ts interested in the otherspecializations. In Experimental laboratory students learn how to prepare for experiments (including work with the		
of the measuremer	t (acquire of different experimental procedures and routines), willteach writing the records of measurement, processing and evaluation	on of results. At the	e same time
0000004	practically extend the knowledge gained in lectures on physics.	-	
02RQGP1	Seminar on Quark-Gluon Plasma 1 The aim of the seminar is discuss the selection of the most fundamental articles in heavy ion physics.	Z	1
02RQGP2	Seminar on Quark-Gluon Plasma 2	Z	1
	The aim of the seminar is discuss the selection of the most fundamental articles in heavy ion physics.	-	
02SMF	Seminar of Mathematical Physics	Z	2
	he seminar is to iluminate mathematical physics by virtue of solved examples. It is supposed that the teachers of the physics departm	_	1
The purpose of th	he seminar is to iluminate mathematical physics by virtue of solved examples. It is supposed that the teachers of the physics departm concerning their scientific activities that could become the topics of the student?s bachelor theses in the next year	ent will present si	mple tasks
The purpose of th 02SPRA1	he seminar is to iluminate mathematical physics by virtue of solved examples. It is supposed that the teachers of the physics departm	kent will present sin	mple tasks
The purpose of th 02SPRA1 Physics measurem	he seminar is to iluminate mathematical physics by virtue of solved examples. It is supposed that the teachers of the physics departm concerning their scientific activities that could become the topics of the student?s bachelor theses in the next year Special Practicum 1 nent focused on instrumental techniques that are mainly used in physics and technical professions. Topics of each parts are chosen s with advanced pats of experimental physics and metrology.	KZ o that students ca	mple tasks
The purpose of th 02SPRA1 Physics measurem 02SPRA2	he seminar is to iluminate mathematical physics by virtue of solved examples. It is supposed that the teachers of the physics departm concerning their scientific activities that could become the topics of the student?s bachelor theses in the next year Special Practicum 1 nent focused on instrumental techniques that are mainly used in physics and technical professions. Topics of each parts are chosen s with advanced pats of experimental physics and metrology. Special Practicum 2	KZ o that students ca	mple tasks 6 n familiarize 6
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The purpose of the purpose of the purpose of the old of the physics measurem of the physics measurem of the old of the physics measurem of the old of the problem, the motion of the physics and transformer of the physics measurem of the physics measurem of the physics of th	e seminar is to iluminate mathematical physics by virtue of solved examples. It is supposed that the teachers of the physics departm concerning their scientific activities that could become the topics of the student?s bachelor theses in the next year Special Practicum 1 event focused on instrumental techniques that are mainly used in physics and technical professions. Topics of each parts are chosen s with advanced pats of experimental physics and metrology. Special Practicum 2 event focused on instrumental techniques that are mainly used in physics and technical professions. Topics of each parts are chosen s with advanced pats of experimental physics and metrology. Theoretical Physics 1 troduction to analytical mechanics. The students acquire knowledge of the basic concepts of the Lagrange and Hamiltonian formalism tynamics (Newton's, Lagrange, Hamilton and Hamilton-Jacobie equations). The efficiency of these methods is illustrated on elementar on of a system of constrained mass points, and of a rigid body. Advanced parts of the course cover differential and integral principles the first part of the course of classicaltheoretical physics (02TEF1, 02TEF2). Theoretical Physics 2 sformations in physics. Mechanics of point mass, rigid body and continuum. The special theory of relativity: relativistic mechanics and me. Classical electrodynamics: Maxwell's equations in the Minkowski space-time, electromagnetic waves in dielectric media, electron approximation. Heat and Molecular Physics nodynamics and statistical physics. Thermodynamic potentials; kinetic theory: Maxwell's velocity dist Thermodynamics and Statistical Physics seciptionfrom a statistical point of view (classical and quasiclassical regime within the frame of a canonical and grand-canonical of crystals and the black body radiation). The Boltzmann equation is usedto discusses simple transport phenomena. Introduction to Elementary Particle Physics se provides an easily accessible introduction to elementary particle physics. Development, methods, goals and	kZ o that students ca KZ o that students ca Z,ZK as well as diferent y examples like th of mechanics. The Z,ZK d classical field the nagnetic radiation Z,ZK ier principle, ideal a rribution,equipartiti Z,ZK ier principle. Statis ensemble, Fermi Z ubject are presente Z or the curves are i of the lecture are the	apple tasks 6 n familiarize 6 n familiarize 4 approaches e two-body e subject is 4 aory in the in the dipole 4 und real gas, ion theorem. 4 tical entropy. gas, models 2 ed. 2 ed.
The purpose of the purpose of the purpose of the old of the physics measurem of the physics measurem of the old of the physics measurem of the old of the problem, the motion of the problem of the physics and transformer of the physics and transformer of the physics of the	e seminar is to iluminate mathematical physics by virtue of solved examples. It is supposed that the teachers of the physics departm concerning their scientific activities that could become the topics of the student?s bachelor theses in the next year Special Practicum 1 enert focused on instrumental techniques that are mainly used in physics and technical professions. Topics of each parts are chosen s with advanced pats of experimental physics and metrology. Special Practicum 2 enert focused on instrumental techniques that are mainly used in physics and technical professions. Topics of each parts are chosen s with advanced pats of experimental physics and metrology. Theoretical Physics 1 troduction to analytical mechanics. The students acquire knowledge of the basic concepts of the Lagrange and Hamiltonian formalism lynamics (Newton's, Lagrange, Hamilton and Hamilton-Jacobi equations). The efficiency of these methods is illustrated on elementar on of a system of constrained mass points, and of a rigid body. Advanced parts of the course cover differential and integral principles the first part of the course of classicaltheoretical physics (02TEF1, 02TEF2). Stormations in physics. Mechanics of point mass, figid body and continuum. The special theory of relativity: relativistic mechanics and me. Classical electrodynamics: Maxwell's equations in the Minkowski space-time, electromagnetic waves in dielectric media, electron approximation. Heat and Molecular Physics of materials, heat transfer; stationary and non-stationary heat conduction, heat transfer and penetration; 1st and 2nd thermodynamic cal systems: dielectric and magnetic materials; Maxwell relations and thermodynamic potentials; kinetic theory: Maxwell's velocity dist dy descriptionfrom a statistical physics. Thermodynamic potential, the Joule Thomson effect, conditions of equilibrium, the Braun-Le Chatel dy descriptionfrom a statistical physics. Thermodynamic potential, the Joule Thomson effect, conditions of equilibrium, the Braun-Le Chatel dy descriptio	kZ o that students ca KZ o that students ca Z,ZK as well as diferent y examples like th of mechanics. The Z,ZK d classical field the hagnetic radiation Z,ZK ier principle, ideal a rribution,equipartiti Z,ZK ier principle. Statis ensemble, Fermi Z ubject are presente Z or the curves are i of the lecture are the Z	apple tasks 6 n familiarize 6 n familiarize 4 approaches e two-body e subject is 4 approaches e two-body e subject is 4 apory in the in the dipole 4 tical entropy. gas, models 2 ed. 2 add. 2
The purpose of th O2SPRA1 Physics measurem O2SPRA2 Physics measurem O2TEF1 The course is an int to description of c problem, the motii O2TEF2 Tensors and tran Minkowski space-ti O2TER Thermal expansior entropy; non-chemi O2TSFA Foundation of therm Basics of many boo O2UFEC The course O2UKP The goal of the le Frenets formulae and O2ZFM1 The lecture is desi	e seminar is to iluminate mathematical physics by virtue of solved examples. It is supposed that the teachers of the physics departm concerning their scientific activities that could become the topics of the student?s bachelor theses in the next year Special Practicum 1 event focused on instrumental techniques that are mainly used in physics and technical professions. Topics of each parts are chosen s with advanced pats of experimental physics and metrology. Special Practicum 2 event focused on instrumental techniques that are mainly used in physics and technical professions. Topics of each parts are chosen s with advanced pats of experimental physics and metrology. Theoretical Physics 1 troduction to analytical mechanics. The students acquire knowledge of the basic concepts of the Lagrange and Hamiltonian formalism tynamics (Newton's, Lagrange, Hamilton and Hamilton-Jacobie equations). The efficiency of these methods is illustrated on elementar on of a system of constrained mass points, and of a rigid body. Advanced parts of the course cover differential and integral principles the first part of the course of classicaltheoretical physics (02TEF1, 02TEF2). Theoretical Physics 2 sformations in physics. Mechanics of point mass, rigid body and continuum. The special theory of relativity: relativistic mechanics and me. Classical electrodynamics: Maxwell's equations in the Minkowski space-time, electromagnetic waves in dielectric media, electron approximation. Heat and Molecular Physics nodynamics and statistical physics. Thermodynamic potentials; kinetic theory: Maxwell's velocity dist Thermodynamics and Statistical Physics seciptionfrom a statistical point of view (classical and quasiclassical regime within the frame of a canonical and grand-canonical of crystals and the black body radiation). The Boltzmann equation is usedto discusses simple transport phenomena. Introduction to Elementary Particle Physics se provides an easily accessible introduction to elementary particle physics. Development, methods, goals and	ent will present sin KZ o that students ca KZ o that students ca Z,ZK as well as diferent y examples like the of mechanics. The Z,ZK d classical field the hagnetic radiation Z,ZK c principle, ideal a rribution,equipartiti Z,ZK ier principle. Statis ensemble, Fermi Z ubject are presented Z or the curves are i of the lecture are the Z an be attended by	apple tasks 6 n familiarize 6 n familiarize 4 approaches e two-body e subject is 4 approaches e two-body e subject is 4 apory in the in the dipole 4 und real gas, ion theorem. 4 tical entropy. gas, models 2 ed. 2 ed. 2 students of

02ZFM2	Foundations of Physical Measurements 2	Z	2
	purse is devoted to the essentials of measurements of the most important physical quantities. It is especially recommended to those since the second se	tudents who are go	ina to studv
	s curricula - Physical engineering and Nuclear engineering. Also the methods of evaluation of statistical data using PC and practical w	•	• •
	is involved. Students learn main rules connected with experimental work in physical laboratory.		
02ZJF	Nuclear Physics	Z,ZK	6
	presents formidable challenges both experimentally and theoretically, simply because we are dealing with the submicroscopic domai		-
	intuition regarding the behaviour of objects fails us. The lecture is a basic introduction to very interesting regions of subatomic pl		
02ZJFB	Nuclear Physics B	KZ	3
	presents formidable challenges both experimentally and theoretically, simply because we are dealing with the submicroscopic domai	1 1	-
	intuition regarding the behaviour of objects fails us. The lecture is a basic introduction to very interesting regions of subatomic pl		
02ZSM	Introduction to the Standard Model	ZK	2
	hadrons, baryons, mesons, symmetry, symmetry group, quarks, gluons, partons, standard model of electroweak and strong interactio	I I	
	(QCD), cross section, scattering cross section.	no, quantum chion	louynamics
		71/	F
04ABZK	English - State Examination	ZK	5
	ent is the examination as given by the study plan. Student is eligible for the State language examination (level C1 or B2 of CEFR) only		
respective courses	s and examinations (04AP3KK, 04APAK, 04API, and 04APRK). From its first semester, part of the APIN programme covers also examinations	nination subjects. A	s requirea,
0441/0	examination conditions comply with respective rules and regulations for state language examinations.	7	4
04AKS	English Conversation	Z	1
	velop the student's communication skills acquired throughout their previous studies. It aims to improve all aspects of oral communication		
	or various communication situations and will master their communication strategy. They will also practise their listening skills in order t		participate
	iscussions. The student will be trained to express their ideas clearly and according to current English usage, and become a more cor	ifident speaker.	
04AM1	English for Intermediate Students M1	Z	1
	gned for students who have successfully completed the full secondary school English language course at least at the A2 level of the C		
of Reference for La	anguages (CEFR). It provides an introduction into English for Specific and Academic Purposes (ESP, EAP), i.e., into fundamentals of	vocabulary and sty	le typical of
professional oral a	and written communication situations. Thus it covers topics related to the student's life and needs as well as topics of subtechnical int	erest. Attention is a	llso paid to
	extending the knowledge of grammar issues used in EAP.		
04AM2	English for Intermediate Students M2	Z	1
The 04AM2 course	expects the student to have completed the 04AM1 course. It develops their skills for work with subtechnical texts, focusing also more of	on specific gramma	r, functions,
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	writing. If necessar	ry, grammar
	revision is included.		
04AM3	English for Intermediate Students M3	Z	1
The course develop	s the skills that enable students to cope with features typical of professional style. Increasing attention is paid to developing subtechnic	al vocabulary and ir	ndependent
understanding of	professional texts. Great emphasis is placed on distinguishing different levels of formal and informal oral and written communication	and their appropria	ate Czech
equivalents. The co	purse also includes studying abstracts and rules for writing them as well as basic rules for preparing and giving a short presentation o	n a chosen topic re	lated to the
	student's field.		
04AMZK	English for Intermediate Students Examination	ZK	4
	t is the examination as given by the study plan. The examination covers the 04AM1, 04AM2, and 04AM3 courses and consists of two	parts - written (10	0 min) and
oral (2	0-30 min). The student is expected to master the AM syllabus and demonstrate the ability to apply their knowledge gained in the three	e English courses.	
04AP1	English for Advanced Students P1	Z	1
	gned for students who have successfully completed the full secondary school English language course (at least the B1 level of the C	ommon European I	Framework
	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	-	
	oral and written communication on topics related to the undergraduate's life and needs. It develops skills for free professional writing (w		
	polite request). If necessary, revision of selected grammar topics is included.		
04AP2	English for Advanced Students P2	Z	1
	is based on 04AP1, thus extending the student's skills for working with subtechnical texts, and even with professional texts of chosen b	branches of science	. According
	needs it concentrates on chosen grammar topics, but mainly intends to develop understanding of syntactic structures and typical rhet		•
	tions, and, if possible, a case study). Increasing emphasis is placed on the undergraduate's independent work with and reading of lin		
	urse extends the student's subtechnical vocabulary, and includes fundamental notions of chosen branches of science. It is focused o	• •	U U
	sentence and paragraph structure, linking, cohesion and coherence in texts.	Ū	Ū
04AP3	English for Advanced Students P3	Z	1
	is based on 04AP2 and expects the student to work without any guidance with authentic professional materials and to interpret the te	–	•
	cation skills and functions (e.g., expressing an opinion, agreement, and objections; taking part in discussion, note-taking; summarizin		0
	paring a project on a given or chosen topic and presenting it. The course places emphasis on distinguishing levels of formal and infor		
	written communication.		
04APZK	English for Advanced Students Examination	ZK	5
	ent is the examination as given by the study plan. The student is supposed to demonstrate mastering the 04AP3 syllabus and the abi	I I	
	ee 04AP courses. The examination consists of 2 parts - written (110 min) and oral (30 min) and includes also oral presentation of a to		-
	study.		
04CESM1	Czech for foreigners - Intermediate	Z	1
		. – .	(for vorious
	ed on correct pronunciation, important morphological phenomena, prepositional phrases, and verb forms as well as on extending the s social situations.	Indenit S vocabulary	101 various
04050140		7	4
04CESM2	Intermediate Czech 2	Z	1
i ne course develo	ps the topics covered in CESM1 and is then focused on more difficult grammar phenomena. It practices writing, speaking, and readir	ig skills and trains t	ine student
04050110	in understanding common abbreviations, abbreviated words, and mathematical terms and formulas.		
04CESM3	Intermediate Czech 3	Z	1
The last course r	evises morphological topics covered earlier and extends the student's knowledge of more difficult language phenomena. It is especial	ally focused on styli	istics and
	lexicology and on developing the student's writing skills.	r	
04CESMZK	Czech for Intermediate Students Examination	ZK	4
The course conten	t is the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of the 04CE	SM1,2,3 courses a	nd can only
	be taken after successful completion of the 3 courses. Detailed information is to be obtained from the teacher.		

04CESP1	Czech for Foreign Students - Advanced Examination	Z	1		
	f the course is very good knowledge of the Czech language, i.e., communicative competences at least at level B2 of the Common Europ				
	It is focused partly on revision of standard language structures, but mainly on practising more complex grammatical structures typical of the style of science. Students are taught the basics of functional style of engineering and professional communication, both in spoken and written form. The topics include University Studies and Student Life. Written practice				
basics of functio	includes communication with teachers and faculty administrators.		i practice		
04CESP2	Czech for Foreigners - Advanced	Z	1		
	ds the student's knowledge acquired in CESP1 and focuses on difficult language phenomena. It practises working with technical and emphasis on individual work.	_			
04CESP3	Czech for Foreigners - Advanced	Z	1		
	ps the student's knowledge from CESP2. It includes working with authentic specialist materials, their interpretation and presentation, a student's project. Writing skills necessary for professional communication are trained.	and, finally, present	tation of the		
04CESPZK	Czech for Foreign Students - Advanced Examination	ZK	5		
	t is the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of the 04CE be taken after successful completion of the 3 courses. Detailed information is to be obtained from the teacher.	SP1,2,3 courses a	nd can only		
04FM1	French for Intermediate Students M1	Z	1		
	ate FM The objective of this three-semester course is to improve and further develop communication in the French language in both v	I I	n. Students		
	ommunicate 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. 04FM1 The course builds on and further develops linguistic competence acquired at secondary school. It revises, syst	emizes and expand	ls language		
	vious study. The following topics are covered: University studies in our country and in France, writing of transactional letters, CV, person				
	French culture and geography, Paris. Topics of specialization: mathematics, physics. Reading technical and popular science texts, wo				
04FM2	French for Intermediate Students M2	Z	1		
	s on FM1. Linguistic structures and competence acquired in previous study are systemized and expanded. Reading popular science text				
and scientific lai	nguage (passives, nominalization, word formation). Topics: physics, power engineering, environment, Internet, success of French scie scientists, artists and architects. Description of an object, device, shapes, dimensions, material.	nce and technolog	y, French		
04FM3	French for Intermediate Students M3	Z	1		
	sed on improvement and further development of linguistic competence acquired during the follow-up courses. Syntactic structures (sub	- 1	ive clauses.		
	res, compound tenses). Text summaryStudents prepare a written paper which will be delivered in form of an oral presentation in-cla				
	uture specialisation or to their interest and generally covers a technical /applied science topic. It is not a translation but a creative work				
and on	e's own knowledge/experience Longer monologues on topics /situations set for the examination are prepared. Text structure, cohesi	on and coherence.			
04FMZK	French for Intermediate Students Examination	ZK	4		
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		amination		
	consists of a written and oral part and is organized according to Examination Instructions, a document available on the well				
04FP1	French for Advanced Students P1	Z	1		
	course The objective of this three-semester course is to improve and further develop communication in the French language in both w				
	imunicate in social interaction and in academic, scientific and work environment. They will be able to use the language to transmit ger Iems. 04FP1 The course builds on and further develops linguistic competence acquired at secondary school. Difficult grammar topics				
	composé-imparfait, pronouns. The following specific topics are covered: University studies in our country and in France, writing of tran	-	-		
	t, answer to an advert, environmental issues, success of French science and technology, chosen topics from French regional culture,		-		
	mathematics, internet, physics, chemistry. Reading of technical and popular science texts, further work with these texts and interp	retation.			
04FP2	French for Advanced Students P2	Z	1		
With the link to P1	contents, the course further develops language skills. Focus is put on reading popular science texts and on oral communication on g technical and scientific communication are stressed (passive voice, nominalization, word formation).	iven topics. Feature	es typical of		
04FP3	French for Advanded Students P3	Z	1		
	sed on systemization and improvement of acquired linguistic competence, skills and knowledge, and their use for communication in eng		-		
skill - translation o	of shorter texts (both from and into the language). Writing of a paper and making oral presentation in-class. The paper generally cover topic. It is a creative work compiled from 3 French sources. Preparation of several set topics for oral examination.	s a technical /appli	ed science		
04FPZK	French for Intermediate Students Examination	ZK	5		
The whole Frencl	h program is ended with an examination covering the contents of FP1-FP3. The examination consists of a written and/or an oral part a		cording to		
	Examination Instructions, a document available on the web. Assessment of the presentation is included into the examination gra	-			
04FZ1	French for Beginners Z1	Z	1		
•	ers The objective of this 5-level course is to be able to communicate in French orally and in writing in situations of everyday life, in soci es French for specific / technical communication and reading of popular science and scientific texts. 04FZ1 The objective is to be able	e 1			
	using the knowledge of chosen elementary language. The contents is roughly outlined by lessons 1 - 7 of the textbook Pravda - Pravd		-		
-	za áte ky). It is extended with situations of communication and functions from the textbook Espaces I, lessons 1-4 : introductions, pe		-		
giving the	directions, simple instructions and questions. Special attention is paid to pronunciation. Spelling is explained in connection with pronu	nciation and gramr	nar.		
04FZ2	French for Beginners Z2	Z	1		
The course is linking	ng up with 04FZ1. Elementary linguistic knowledge and communication skills are expanded. The scope is given by lessons 8 - 13 of the	e textbook: Pravda	- Pravdová		
•	inners . Additional topics and skills are filled in from the textbook Espaces I, lesson 1 - 5 (introductions, invitation, welcoming, agreem	•			
thanking, travelling	I, map of France, food, expression of will, wish, order, prohibition, pleasure). Correct pronunciation is practiced. Stress on oral communic	cation. Specific topi	cs covered:		
04572	How does the machine work? A few expressions concerning the study. Name of University and Faculty.	7	1		
04FZ3	French for Beginners Z3 upon 04FZ2. Basic linguistic knowledge and skills are developed. The contents is given by lessons 14 - 18 of the textbook: Pravda - Pr	Z ravdová: French for	Beginners		
	s and situations are complemented from other materials. Stress is put on oral communication in dialogues and on reading, both for info		-		
	pronunciation practice. Reading covers short adapted texts of general interest first, and later popular science texts.				
04FZ4	French for Beginners Z4	Z	1		
	up on 04FZ3. Basic linguistic knowledge and skills are further developed. Oral communication and reading skills are practiced. The co				
	the textbook French for Beginners, and is expanded with topics and functions from other materials. Reading is developed from the lecture				
Students of FJFI.	The course covers generals and specific topics: health- illness, sport, free time, environment, study, travelling in France, Paris, shopp country and in France, how to write CV, application, topics in mathematics, reading physics - mechanics, informatics, internet.	-	isily in our		
04FZ5	French for Beginners Z5	Z	1		
	red in FZ4 are further developed, as well as technical language. Students prepare a paper on a chosen popular science topic. They pi	I I			
	is covered by lessons 24 - 26 of the textbook: Pravda-Pravdova, French for Beginners, and is complemented from other materials. To	-			

niuncti

10103, 3000033 0	subjunctive clauses, gerund, passive.		inctions,
04FZZK	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	ation is ruled by the	e document
	Instruction for examination. Its content covers the levels FZ1 - FZ5.		
04NM1	German for Intermediate Students M1	Z	1
	course is to level off the students' skills in the German language. The course focuses on revision of more difficult phenomena and str		
	processes (e.g. importance of verb prefixes). In the lexical part, it covers topics referring to higher education in both the Czech Repul ues 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		
04NM2	German for Intermediate Students M2	7	1
• • • • • • • •	es other more complex grammatical structures and their application in communication based on technical texts, such as the relation be	tween technology	and society,
	eginning of the 21st century, linguistically more demanding texts on the environment, the language of mathematics, computers and c		
practise reading for i	information and reading aloud, and appropriate language for various purposes in oral and written communication. The course systematic	cally revises other g	grammatical
	phenomena important for professional discourse (participles, relative clauses).		
04NM3	German for Intermediate Students M2	Z	1
	es other more complex grammatical structures and their application in communication based on technical texts, such as the relation be eginning 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).		,
04NMZK	German for Intermediate Students Examination	ZK	4
The course content	is the examination as given by the study plan. The whole German for Intermediate Students Course is completed by an examination c	onsisting of two pa	rts - written
and oral, which cove	er the courses 04NM1 - 04NM3. The oral part follows after passing the written part successfully and after obtaining the 04NM3 assessm	ent. More detailed	information
	is to be obtained from the teacher.		
04NP1	German for Advanced Students P1	Z	1
	es good grammar knowledge, extended general vocabulary, and good communication skills acquired at secondary school to be levell e is then focused on working with technical and scientific texts and practising reading techniques (skimming, scanning, reading for de	-	-
	ar structures necessary for understanding a subtechnical text (passive voice, participles, participle structures) and it also focuses on practice of the structures and practice of the structures and the structures of the structu	,	
inere annean grannin	i.e., telephoning.		indinocatori,
04NP2	German for Advanced Students P2	Z	1
The course develops	s the students' skills in working with professional scientific texts (understanding, summarising, note-taking, interpreting) while extending	their general and s	ubtechnical
	introduces mathematical expressions and texts of nuclear power engineering. Increasing emphasis is placed on understanding and pra	-	munication,
	th written and oral (CV, letter of application, interview, scholarship), and more complex grammatical structures (i.e., subjunctive, indir	ect speech).	
04NP3	German for Advanced Students P3	Z	1
	ts of 3 main parts (general communicative situations, grammar and technical topics). Students will develop their vocabulary in a varie d 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.		
	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.		
04NPZK	German for Advanced Students Examination	ZK	5
	is the examination as given by the study plan. The whole German for Advanced Students Course is completed by an examination of		
and oral, which cove	er the courses 04NM1 - 04NM3. The oral part follows after passing the written part successfully and after obtaining the 04NP3 ungrad	ed assessment. M	ore detailed
040144	information is to be obtained from the teacher.	7	4
04RM1	Russian for Intermediate Students M1 ned for students with previous knowledge of Russian from secondary schools. Students are supposed to know the Russian alphabet (Z both printed and b	1 andwritten)
-	r communication in everyday situations (introductions, socializing, greetings, shopping for food and objects of everyday need, asking t	-	
	ic grammar structures (verbal and nominal forms, irregular verbs, pronouns). The initial knowledge corresponds to the achievement lo	, , ,	
	contents and scope of the course correspond approximately to the RZ3 course, but for half of the time allotted in the timetable	le.	
04RM2	Russian for Intermediate Students M2	Z	1
Т	he course is based on the RM1 course, its contents and scope correspond roughly to RZ4, however, for half of the time allotted in the	e timetable.	
04RM3	Russian for Intermediate Students M3		
The course develop		Z	1
	s 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	Z	-
	s the knowledge and skills acquired in RM1 and RM2 and its contents and scope are roughly at the same level as those of RZ5, howe in the timetable.	Z ver, for half of the t	ime allotted
04RMZK	s the knowledge and skills acquired in RM1 and RM2 and its contents and scope are roughly at the same level as those of RZ5, howe in the timetable. Russian for Intermediate Students Examination	Z ver, for half of the t ZK	ime allotted
The course content	s the knowledge and skills acquired in RM1 and RM2 and its contents and scope are roughly at the same level as those of RZ5, howe in the timetable. Russian for Intermediate Students Examination is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowled	Z ver, for half of the t ZK ge and skills acqui	ime allotted 4 red in RM1
The course content - RM3. Stude	s the knowledge and skills acquired in RM1 and RM2 and its contents and scope are roughly at the same level as those of RZ5, howe in the timetable. Russian for Intermediate Students Examination t is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowled ents are eligible for the oral examination only after a prior pass in RM3 and a successful written examination. Students are given instr	Z ver, for half of the t ZK ge and skills acqui uctions by the tea	ime allotted 4 red in RM1 cher.
The course content - RM3. Stude 04RP1	s the knowledge and skills acquired in RM1 and RM2 and its contents and scope are roughly at the same level as those of RZ5, howe in the timetable. Russian for Intermediate Students Examination is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowled	Z ver, for half of the t ZK ge and skills acqui ructions by the tear Z	ime allotted 4 red in RM1 cher. 1
The course content - RM3. Stude 04RP1	s the knowledge and skills acquired in RM1 and RM2 and its contents and scope are roughly at the same level as those of RZ5, howe in the timetable. Russian for Intermediate Students Examination t is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowled ents are eligible for the oral examination only after a prior pass in RM3 and a successful written examination. Students are given instr Russian for Advanced Students P1	Z ver, for half of the t ZK ge and skills acqui ructions by the tear Z	ime allotted 4 red in RM1 cher. 1
The course content - RM3. Stude 04RP1 The entrance requ 04RP2	s the knowledge and skills acquired in RM1 and RM2 and its contents and scope are roughly at the same level as those of RZ5, howe in the timetable. Russian for Intermediate Students Examination is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowled ents are eligible for the oral examination only after a prior pass in RM3 and a successful written examination. Students are given instr Russian for Advanced Students P1 iirement for the course is to achieve the B1 CEFR level. The objective of the course is revision of standard language structures, pract structures, understanding the fundamentals of technical language and training writing skills. Russian for Advanced Students P2	Z ver, for half of the t ZK ge and skills acqui ructions by the teac Z ticing more difficult	ime allotted 4 red in RM1 cher. 1 grammar 1
The course content - RM3. Stude 04RP1 The entrance requ 04RP2	s the knowledge and skills acquired in RM1 and RM2 and its contents and scope are roughly at the same level as those of RZ5, howe in the timetable. Russian for Intermediate Students Examination is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowled ents are eligible for the oral examination only after a prior pass in RM3 and a successful written examination. Students are given instr Russian for Advanced Students P1 irrement for the course is to achieve the B1 CEFR level. The objective of the course is revision of standard language structures, pract structures, understanding the fundamentals of technical language and training writing skills. Russian for Advanced Students P2 ed on RP1. It expands grammatical structures important for understanding technical texts (verbal adjectives, participles, passives, ve	Z ver, for half of the t ZK ge and skills acqui ructions by the teac Z ticing more difficult	4 red in RM1 cher. 1 grammar
The course content - RM3. Stude 04RP1 The entrance requ 04RP2 The course is base	s the knowledge and skills acquired in RM1 and RM2 and its contents and scope are roughly at the same level as those of RZ5, howe in the timetable. Russian for Intermediate Students Examination is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowled ents are eligible for the oral examination only after a prior pass in RM3 and a successful written examination. Students are given instr Russian for Advanced Students P1 iirement for the course is to achieve the B1 CEFR level. The objective of the course is revision of standard language structures, prace structures, understanding the fundamentals of technical language and training writing skills. Russian for Advanced Students P2 ed on RP1. It expands grammatical structures important for understanding technical texts (verbal adjectives, participles, passives, ve structures). Stress is put on independent oral and written communication.	Z ver, for half of the t ZK ge and skills acqui uctions by the teac Z ticing more difficult Z rb aspects, specific	4 red in RM1 cher. 1 grammar
The course content - RM3. Stude 04RP1 The entrance requ 04RP2 The course is base 04RP3	s the knowledge and skills acquired in RM1 and RM2 and its contents and scope are roughly at the same level as those of RZ5, howe in the timetable. Russian for Intermediate Students Examination is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowled ents are eligible for the oral examination only after a prior pass in RM3 and a successful written examination. Students are given instr Russian for Advanced Students P1 iirement for the course is to achieve the B1 CEFR level. The objective of the course is revision of standard language structures, pract structures, understanding the fundamentals of technical language and training writing skills. Russian for Advanced Students P2 ed on RP1. It expands grammatical structures important for understanding technical texts (verbal adjectives, participles, passives, ve structures). Stress is put on independent oral and written communication. Russian for Advanced Students P3	Z ver, for half of the t ZK ge and skills acqui uctions by the tead Z ticing more difficult Z rb aspects, specific	4 red in RM1 cher. 1 grammar 1 c syntactic 1
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The course content - RM3. Stude 04RP1 The entrance requ 04RP2 The course is base 04RP3 The course is base courses require good	s the knowledge and skills acquired in RM1 and RM2 and its contents and scope are roughly at the same level as those of RZ5, howe in the timetable. Russian for Intermediate Students Examination is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowled ents are eligible for the oral examination only after a prior pass in RM3 and a successful written examination. Students are given instr Russian for Advanced Students P1 iirement for the course is to achieve the B1 CEFR level. The objective of the course is revision of standard language structures, pract structures, understanding the fundamentals of technical language and training writing skills. Russian for Advanced Students P2 ed on RP1. It expands grammatical structures important for understanding technical texts (verbal adjectives, participles, passives, ve structures). Stress is put on independent oral and written communication. Russian for Advanced Students P3	Z ver, for half of the t ZK ge and skills acqui uctions by the tead Z ticing more difficult Z rb aspects, specific Z g, translation). The e courses develop	4 red in RM1 cher. 1 grammar 1 c syntactic 1 RP1 - RP3 and expand
The course content - RM3. Stude 04RP1 The entrance requ 04RP2 The course is base 04RP3 The course is base courses require goo these skills. Furthe	s the knowledge and skills acquired in RM1 and RM2 and its contents and scope are roughly at the same level as those of RZ5, howe in the timetable. Russian for Intermediate Students Examination is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowled ents are eligible for the oral examination only after a prior pass in RM3 and a successful written examination. Students are given instr Russian for Advanced Students P1 iirement for the course is to achieve the B1 CEFR level. The objective of the course is revision of standard language structures, prace structures, understanding the fundamentals of technical language and training writing skills. Russian for Advanced Students P2 ed on RP1. It expands grammatical structures important for understanding technical texts (verbal adjectives, participles, passives, ve structures). Stress is put on independent oral and written communication. Russian for Advanced Students P3 d on RP2 and is mainly focused on working with technical and scientific texts (reading comprehension, oral and written paraphrasing of previous knowledge of general language at secondary level (listening, reading, correct communication in everyday situations). The	Z ver, for half of the t ZK ge and skills acqui uctions by the tead Z ticing more difficult Z rb aspects, specific Z g, translation). The e courses develop itten interpretation	4 red in RM1 cher. 1 grammar 1 c syntactic 1 RP1 - RP3 and expand). Students
The course content - RM3. Stude 04RP1 The entrance requ 04RP2 The course is base 04RP3 The course is base courses require goo these skills. Furthe develop their subteo	s the knowledge and skills acquired in RM1 and RM2 and its contents and scope are roughly at the same level as those of RZ5, howe in the timetable. Russian for Intermediate Students Examination is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowled ents are eligible for the oral examination only after a prior pass in RM3 and a successful written examination. Students are given instr Russian for Advanced Students P1 iirement for the course is to achieve the B1 CEFR level. The objective of the course is revision of standard language structures, prace structures, understanding the fundamentals of technical language and training writing skills. Russian for Advanced Students P2 ed on RP1. It expands grammatical structures important for understanding technical texts (verbal adjectives, participles, passives, ve structures). Stress is put on independent oral and written communication. Russian for Advanced Students P3 d on RP2 and is mainly focused on working with technical and scientific texts (reading comprehension, oral and written paraphrasing of previous knowledge of general language at secondary level (listening, reading, correct communication in everyday situations). The r study is aimed at professional and technical skills (reading technical literature according to the students' specialization, oral and writch communication in professional situations in professional situations in professional situations. They will be able to both speak write accurate technical topics.	Z ver, for half of the t ZK ge and skills acqui uctions by the tead Z ticing more difficult Z rb aspects, specific Z g, translation). The e courses develop itten interpretation urately and with co	4 red in RM1 cher. 1 grammar 1 c syntactic 1 RP1 - RP3 and expand). Students
The course content - RM3. Stude 04RP1 The entrance require 04RP2 The course is base 04RP3 The course is base courses require good these skills. Furthe develop their subted 04RPZK	s the knowledge and skills acquired in RM1 and RM2 and its contents and scope are roughly at the same level as those of RZ5, howe in the timetable. Russian for Intermediate Students Examination t is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowledents are eligible for the oral examination only after a prior pass in RM3 and a successful written examination. Students are given instr Russian for Advanced Students P1 uirement for the course is to achieve the B1 CEFR level. The objective of the course is revision of standard language structures, pract structures, understanding the fundamentals of technical language and training writing skills. Russian for Advanced Students P2 ed on RP1. It expands grammatical structures important for understanding technical texts (verbal adjectives, participles, passives, ve structures). Stress is put on independent oral and written communication. Russian for Advanced Students P3 d on RP2 and is mainly focused on working with technical and scientific texts (reading comprehension, oral and written paraphrasing od previous knowledge of general language at secondary level (listening, reading, correct communication in everyday situations). The r study is aimed at professional and technical skills (reading technical literature according to the students' specialization, oral and write chnical vocabulary and practice quick and correct communication in professional situations. They will be able to both speak write according to the students is pace and technical skills (reading technical literature according to the students' specialization, oral and write contechnical topics. Russian for Intermediate Students Examination	Z ver, for half of the t ZK ge and skills acqui uctions by the tead Z ticing more difficult Z rb aspects, specific Z g, translation). The e courses develop itten interpretation urately and with co ZK	4 red in RM1 cher. 1 grammar 1 c syntactic 1 RP1 - RP3 and expand). Students nfidence on 5
The course content - RM3. Stude 04RP1 The entrance requinance 04RP2 The course is base 04RP3 The course is base courses require good these skills. Furthe develop their subted 04RPZK The course content	s the knowledge and skills acquired in RM1 and RM2 and its contents and scope are roughly at the same level as those of RZ5, howe in the timetable. Russian for Intermediate Students Examination is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowled ents are eligible for the oral examination only after a prior pass in RM3 and a successful written examination. Students are given instr Russian for Advanced Students P1 iirement for the course is to achieve the B1 CEFR level. The objective of the course is revision of standard language structures, prace structures, understanding the fundamentals of technical language and training writing skills. Russian for Advanced Students P2 ed on RP1. It expands grammatical structures important for understanding technical texts (verbal adjectives, participles, passives, ve structures). Stress is put on independent oral and written communication. Russian for Advanced Students P3 d on RP2 and is mainly focused on working with technical and scientific texts (reading comprehension, oral and written paraphrasing of previous knowledge of general language at secondary level (listening, reading, correct communication in everyday situations). The r study is aimed at professional and technical skills (reading technical literature according to the students' specialization, oral and writch communication in professional situations in professional situations in professional situations. They will be able to both speak write accurate technical topics.	Z ver, for half of the t ZK ge and skills acqui uctions by the tead Z ticing more difficult Z rb aspects, specific Z g, translation). The e courses develop itten interpretation urately and with co ZK ge and skills acqui	4 red in RM1 cher. 1 grammar 1 c syntactic 1 RP1 - RP3 and expand). Students nfidence on 5 red in RP1

04RZ1	Russian for Beginners Z1	Z	1
	ents the first stage of the five-semester programme, its final aim being reading and understanding professional texts written in Russiar	1. Thus it begins wit	h mastering
the Russian alpha	bet (for both reading and writing skills) and fundamentals of grammar necessary for everyday communication (listening and speaking). Students will be a	able to read
	a short text with marked stress, understand its contents and summarize it.		
04RZ2	Russian for Beginners Z2	Z	1
	ster of the programme is designed to teach skills for basic communication in everyday situations and for reading easy and short subt	echnical texts. Stud	lents will be
able to communica	te using short sentences and appropriate structures, and read aloud with confidence a short text without marked stress. They will als	o develop their voc	abulary and
	master further grammatical structures. They will have mastered with confidence the Russian alphabet and will be able to use it in	writing.	
04RZ3	Russian for Beginners Z3	Z	1
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.		
04RZ4	Russian for Beginners Z4	Z	1
	sed on 04RZ3. It improves and expands the knowledge of general language in all four skills (reading and understanding longer texts		
unfamiliar words,	oral communication in everyday situations, writing longer texts). Students are trained to use grammar structures effectively (e.g., irreg	jular verbs, differen	ces in verb
patterns from Cz	ech, modality, imperatives, conditionals). They practice and develop communication skills for everyday situations (food, travelling, free	e time), and practic	e oral and
written communic	ation on more specific topics (environment, addictions, the green movement). They become acquainted with various geographical da	ta (e.g., Siberia), le	arn how to
	fill in forms, look up the information from the timetable, learn about Russian holidays and typical meals.		
04RZ5	Russian for Beginners Z5	Z	1
The course expect	s the student to have completed RZ4. It concentrates predominantly on reading skills (working with professional texts, i.e. understandir	ng, 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. Com	munication skills ar	e trained on
	Studying grammar is based on professional and technical texts and only includes items typically used in professional communication		participles,
	ve voice). Students develop their technical and economic vocabulary, and are also trained in some professional skills (writing a CV, po		
04RZZK	Russian for Beginners Examination	ZK	3
	nt is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowled		
	lents are eligible for the oral examination only after a prior pass in RZ5 and a successful written examination. Students are given instr	ructions by the tead	
04SM1	Spanish for Intermediate Students M1	Z	1
	signed for students whose competence is at level B1 of CEFR, i.e. those who studied Spanish in the secondary school. The 3-semes		
	ays attention to further grammar topics (e.g., perífrasis verbales, futuro imperfecto, direct object and indirect object pronouns, negativ		
-	e), to written and oral communication on a given everyday or easy subtechnical topic, for which the students are trained by reading text	kts or listening to th	
04SM2	Spanish for Intermediate Students M3	Z	1
The course devel	ops 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.		-
04SM3	Spanish for Intermediate Students M3		1
	are supplemented with additional subtechnical materials, so the students will be gradually acquainted with the peculiarities of academ		
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		maries. The
0401471/	final part of the programme, general Spanish course based on course books, covers presentations and, finally, a written and oral ex		4
04SMZK	Spanish for Intermediate Students Examination	ZK	4
The course conte	ent is the examination as given by the study plan. 04SMZK examination consists of two parts - written and oral; to be eligible for the w obtained non-graded assessment for course 04SM3.Oral examination follows the written part.	milen part, student	s will have
04SP1		7	4
	Spanish for Advanced Students P1 es on more difficult grammar topics, revision of vocabulary, basics of Spanish for specific purposes as well as written communication.	. –	I I B2
Course concentrat	of CEFR.	oourse prerequisit	
04SP2	Spanish for Advanced Students P2	Z	1
	second part of the advanced Spanish course, extending Spanish for specific purposes topics. It comprises more grammar and synta	1	-
	written communication.		
04SP3	Spanish for Advanced Students P3	Z	1
	e final part of the advanced Spanish course. It is based on texts chosen by the students according to their future specialization. It is for	1 1	-
	based on what students will need in their career.		
04SPZK	Spanish for Advanced Students Examination	ZK	5
	nt is the examination as given by the study plan. Examination 04SPZK consists of two parts, namely oral and written. The prerequisit	1	
h	aving passed the written test. Examination content is based on syllabi of courses SP1, SP2, and SP3 or on an individual study plan c	of the student.	
04SZ1	Spanish for Beginners Z1	Z	1
	he first stage of the five-semester programme of Spanish studies; during the first stage the students will master phonetics and fundan	nental grammar str	uctures and
will be able t	to communicate at an elementary level on topics of everyday life. They will acquire and extend fundamental vocabulary of general Spa	anish and will deve	lop it.
04SZ2	Spanish for Beginners Students Z2	Z	1
Course 04SZ2 is	based on course 04SZ1, and expects students to develop and extend the knowledge and skills acquired so far. Grammar structures a	and lexis will be ch	osen so as
to enable them to	understand short adapted written texts and speech. Attention is also paid to cultural differences between Spanish-speaking countries	and others such a	s the Czech
	Republic. Realia of Spanish-speaking countries are also included.		
04SZ3	Spanish for Beginners Z3	Z	1
The course is base	ed on course SZ2, and develops the student's vocabulary and grammar structure. The course covers realia (history and culture) of th	e Spanish-speakin	g countries,
mainly of Spain.	It pays attention to further grammar topics (pretérito perfecto, pretérito indefinido, pretérito imperfecto, the gerund and the imperative). It includes writter	n and oral
	communication on a given general topic, for which the student is trained by reading texts or listening to them.		
04SZ4	Spanish for Beginners Z3	Z	1
	ed on course SZ3. It develops the student's vocabulary and extends the knowledge of the culture and social customs of the Spanish		-
Spain. It pays atte	ntion to further grammar topics (perifrasis verbales, futuro imperfecto, direct object and indirect object pronouns, negative form of the		ubjunctive),
	to written and oral communication on a given general or subtechnical topic, for which the student is trained by reading texts or listeni	-	
04SZ5	Spanish for Beginners Z5	Z	1
The course books	are supplemented with additional subtechnical materials, so the students will be gradually acquainted with peculiarities of Spanish for		s. In its final
	part, the general Spanish course based on the course book will end with presentations and, finally, a written and oral examina	ation.	

04SZZK	Spanish for Beginners Examination	ZK	3
The course conte	nt is the examination as given by the study plan. Examination consists of two parts - written and oral. Student can register for oral ex passed the written examination test.		e/she has
11ANEL	Linear Circuit Analysis	Z,ZK	4
	ntroduction to the linear electronics for physicists. In the first part it describes basic methods of linear circuit analysis. It is especially of the computer methods of analysis. The second part gives a short list of most commonly used circuits in experimental equipr	oriented to the unc	derstanding
11APLG	Applications of Group Theory in Solid State Physics	ZK	2
	tomic system symmetry allows, without any quantitative calculations, rigorously and precisely determine how many energy states the		
	ween them may occur. Therefore, the main purpose of this course is to describe the methods by which we can extract the information		
alone will provide. I	The application of these methods is illustrated by an example of molecular orbitals, inner orbitals of ions in the crystal field environment without and calculate rules for entired observation transitions.	nt, normal modes of	of molecular
11ELEA	vibrations, and selection rules for optical absorption transitions. Instrumentation and Measurement	Z,ZK	2
	The course is the introduction to the instrumentation and measurement for physicists.	Ζ,ΖΝ	2
11MIK	Logical Circuits and Microprocessors	Z,ZK	4
	introduction to the digital electronics for physicists. It describes the function principles of combination circuits, simple sequential circu		ircuits like
	microprocessors. The microcomputer architecture and principles of interfacing is shown.		
11SFBM	Structure and Function of Biomolecules	Z,ZK	3
	omolecular structure is crucial for the understanding of its function. The subject is focused on the introduction to building blocks of man		rall structure
	and its structure:function relationship including macromolecular complexes.		
11UFPLN	Introduction to Solid State Physics	ZK	2
	The purpose of this lecture is to introduce the undergraduate students to the study of the solid state physics.		
11UVOD	Introduction to Specialization	Z	2
	The purpose of this lecture is to introduce the undergraduate students to the physical master degree study programmes.		1
11ZFPL	Basic to Solid State Physics	KZ	2
	amental properties of solids following the regular long distance ordering of atoms in a crystal lattice. Based on the introduced bonding	-	
	s of crystals and their properties are defined. The model of crystalline lattice dynamics in harmonic approximation is described and basic periodic potential of the crystal lattice is introduced and its relation to the following model describing the energetic state of electrons in		
	plained. The special consequences of band approach to the physical properties of solids are elucidated. The aim of the course is to s	-	
	interpret a broad phenomenological basis of physical properties of crystalline solids	yotomatioally intro	
12APL	Application of Lasers	Z,ZK	2
	plication of lasers in industrial technologies, medicine, remote sensing, energetics, telecommunication, military, entertainment and ot	,	-
12AUX	Administration of UNIX System	KZ	2
	Basic and more advanced administration of Unix operating system		1
12EPR1	Basic Electronics Practicum 1	KZ	3
The aim of the pra	acticum is 1) to acquire basics skills in electronics and 2) to learn independent problem solving, formulation of a task and formulation	of the results. The	practicum
	consists of blocks lasting 4 hours.		
12EPR2	Basic Electronics Practicum 2	KZ	3
The aim of the pra	acticum is 1) to acquire basics skills in electronics and 2) to learn independent problem solving, formulation of a task and formulation	of the results. The	practicum
4010104	consists of blocks lasting 4 hours.	7 71/	0
12INS1	Information Systems 1 ogy, architecture of the databases, network databases, cloud application Google, Microsoft, information managament, aproaches to so	Z,ZK	2
12INS2	Information Systems 2	Z,ZK	2
-	formation systems 1 is required. In more details: Information technology, architecture of the databases, network databases, cloud ap		1
	information managament, aproaches to solve task of information systems	gg, ··	,
12LAS	Laser Systems	Z,ZK	3
	nanosecond lasers. Picosecond lasers. High energy laser systems. Laser fusion. Diode-pumped solid state lasers. Tunable lasers. C		1
and raman lasers.	Semiconductor lasers for pumping of solid state lasers and diode pumped solid state lasers Amplified spontaneous emission. Ultravi	olet lasers. X-ray la	asers. High
	power continuous lasers. Infrared high power lasers. Submilimeter lasers. Lasers with high degree of coherence. Free electron la	asers.	
12LT1	Laser Technique 1	Z,ZK	3
	Stability. Transverse and Longitudinal Modes. Elements of Open Resonators. Threshold of laser oscillations. Gausian beam as an app		
	ethod. Optical radiation propagation in resonant medium. Two-level approximation. Equations for polarisation and inversion, dispersion on-coherent pulse propagation. Optical solitons. Photon echo. Superradiation. Amplified spontaneous emission Lasers without optica		erent and
12LT2			2
	Laser Technique 2 Laser oscillator, the rate equation, the laser amplifier, Q-switching, mode-locking	Z,ZK	2
12MOF	Molecular Physics	ZK	2
	deas on multi-atomic molecules and molecular matter, and on structure-to-physical properties relations. Methods of molecular structu		
12MPR1	Microprocessors 1	ZK	4
	nd microcomputer, microprocessor types, memory types CPU, memory, Input output. Code and data, addressing modes(direct, indiru		1 -
	calls, IO devices - program control, interrupt. Microprocessor Microchip PIC16F877A, Instruction codes- Assembler and Macroassem	-	
	RISC processors - principles		
12MPR2	Microprocessors 2	ZK	2
	chitecture IA-32. Data types and addressing. Memory segmentation and paging. Real and privileged mode. Instruction set, Assemble		1
12NME1	Numerical Methods 1	Z,ZK	4
	d the basic principles of numerical mathematics important for numerical solving of problems important for physics and technology. Me		-
important for physi	cists (ordinary differential equations, random numbers) are included in addition to the basic numerical methods. Integrated computat used as a principle programming language as a demonstration tool. The seminars are held in computer laboratory.	ional environment	IVIAI LAB IS
12NT		ZK	2
	Nanotechnology luce students mainly to modern technological methods of preparation of semiconductor, metal and dielectric nanostructures. Physica		1
	gies (MBE, MOVPE, EBL, sol-gel and colloidal solution) will be explained. Substantive attention will be devoted to epitaxial technological tec		
	paration. Particular emphasis will be focused on detail characterization of "in situ" and "ex situ" techniques, their applications for heter		

growths will be discussed as well. Some supportive technical methods - lithography, diffusion, evaporation, ion implantation, contact and dielectric layer preparation will be mentioned

	as well as soldering and encasement.		
12PDR1	Data Communication and Interfaces 1	Z	2
	Principles of computer networks, networks architectures and data transfer. Specification of existing network architectures.		
12PDR2	Data Communication and Interfaces 2	Z	2
	Principles of Ethernet standards and basics of protocol suite TCP/IP.	_	-
12PIN1	Practical Informatics for Technics 1	Z	2
•	operating systems. Personal computer, workstation and supercomputers. Processor, memory, bus, devices, hard disk, network interfact ing systems. Requirements on operating system for research and technical computing. Operating system UNIX. Basic principles, kernel, k		
	ibutes, working with files. Text editors: vi, emacs. Command interpreter (shell) sh, csh and its programming (scripts). Controlling proces		
	priorities. Standard tools. Graphical user interface X-windows. Computer networks. Local computer networks. Global computer networks	-	-
	protocols TCP/IP. Network configutation of a computer. Network services: hardware sharing, mail, ftp, etc. Network application		
12PIN2	Practical Informatics for Technics 2	Z	2
Practically oriented	d three semester course of basics and applications of informatics for science and engineering included as obligatory alternative cours	se. Constituent par	t is realized
	in computer classrooms. The second part of the course is "Introduction to computer algebra systems?.		
12PIN3	Practical Informatics for Technics 3	Z	2
Practically oriented	d three semester course of basics and applications of informatics for science and engineering included as obligatory alternative course	se. Constituent par	t is realized
	in computer classrooms. The third part of the course is "Introduction to scientific computing?.		
12POAL	Computer Algebra	KZ	2
	n of basic objects (integers, rational and algebraic numbers, polynomials, rational functions, radicals, algebraic functions), arithmetics, s		
	derivation, series summation, integration, ordinary differential equations, factorization, equations solving, quantifier elimination, subst ning, graphics, Maple - detailed introduction and solving of practical examples, applications, overview of other systems (Axiom, Macsyr		-
12PSEM	Problem Seminary	Z	2
	th topics from the region of solid materials engineering, physical electronics, materials science, nuclear reactors, dosimetry and appli	_	
12PYTH	Scientific Programming in Python	7	2
	rse is to learn the fundamentals of the modern Python programming language with a focus on scientific computing. Emphasis is place	d on effective solu	
	ourse is performed in an interactive form of practical exercises, whose topics can be tailored to the content of other subjects or stude		
	ng research. In the introductory part of the course, students learn the basic features of Python? from basic types to object oriented or		
greater part of th	e course focuses on specific features of Python for scientific programming. Presented are the main numerical libraries NumPy, SciPy	and the Matplotlik	graphics
	library. We show how to generate efficient code, how to combine Python with other languages, what tools are available.		
12TAIS	Ion Beam Techniques and Applications.	ZK	3
	Production and forming of ion beam, charged particle optics, interaction of ion with solid matter, technological and analytical appli		
12ULT	Introduction to Laser Technique	Z,ZK	3
	ctromagnetic radiation sources; laser principle; classification of lasers; characterization and rough application of various types of lase		
12UMF	Introduction to Modern Physics	Z	3
I ne course is inten	ded to be a concise introduction to modern / nonclassical physics for students who have already had basic classical physics course. A	part of the course	is delivered
12VAK	in a computational laboratory.	KZ	4
	Vacuum Physics and Technology : basic concepts and relations; flow of rarefied gas. Interaction of gas with surface of solid surface; sorption, desorption; evaporation,		4 transport
-	atter; Vacuum generation. Pumping process. Pumps. Vacuum measurements: vacuum gauges of total and partial pressure; pumping s	-	-
	searching for leaks. Materials and vacuum instalation parts. Practical exercises.	, , , , , , , , , , , , , , , , , , , ,	, , , , , , , , , , , , , , , , , , ,
12VFT	High Frequency and Impulse Circuitry	Z,ZK	2
The goals of cou	rse is to collect advanced knowledge in high frequency technics and high speed events. The course is focused on Maxwell equation s	olution, Gunn's die	odes, high
	frequency technics, microwaves guidelines, striplines, oscillators, amplifiers and pulse generators.		
12VTV	Scientific and Technical Computing	Z	2
The students get	familiar with methods of solving of computational problems in the scientific and technical practice, and with methods of their program	ming. The course i	s oriented
	mainly to programming in the Fortran language.		
12ZAOP	Fundamentals of Optics	Z,ZK	2
	s the very basics of optics - electromagnetic theory, linear optical physics and material effects, basics of nonlinear effects, and geome	-	-
	otain, on the bachelor level, broad and general information on optics, giving an essential orientation in the field, especially with respec bics are further elaborated during departmental masters program. The lecture stems from the electrodynamic notion of plane waves in		
	ther from material medium. It explains basics of linear and nonlinear response in material medium and dispersion properties. It next in	· •	
	, it explains processes induced by boundary conditions at interfaces. It also discusses the consequences of statistics on interference	-	
	rence and their applications in interferometers. Based on the Fresnel diffraction integral, diffraction processes are presented in a graphica		
of grating diffraction	n. Based on this diffraction principle, basic functioning of holography is clarified. Finally, the lecture unravels the geometrical optics limit	. It takes notice on	geometrical
	proach imaging, substitutive schema of a paraxial imaging system, and optical aberrations. It shows fundamentals of imaging in optical	al instruments.	
12ZDP	Data Processing for Publishing	Z	2
	uter computer-assisted publishing, coding of text, OCR (optical code recognition), DTP (desk top publishing), programming language		
Η Ι ML, XML,, β	publishing into www pages, cloud computing, commonly used graphical formats, formatting of typical data (PDF, PS, DOC, DOCX, PP-	S, PPSX, RFT, XL	S, XLSX),
107511	multimedial presentations, multimedial formats.	7 74	2
12ZEL1	Basic Electronics 1 des primary knowledge of circuit theory concerning principles of electronic circuits in both stationary and harmonic stable state. Circu	Z,ZK it analysis method	3 s for linear
	e symbolic and complex method are explained. Proper circuit analysis is also lectured. The subject's final part deals with transient eff	-	
12ZEL2	Basic Electronics 2	Z,ZK	3
	ws up with the Basic Electronics 1. Semiconductor elements basic properties are explained. Thecourse's final part deals with basic th		
12ZFP	Principles of Plasma Physics	Z,ZK	4
	gh temperature plasmas is explained using particle, kinetic and fluid approaches. It includes drift motions and adiabatic invariants, line		
and propagation of	electromagnetic waves in inhomogeneous plasmas. Basic non-linear effects, such as ponderomotive force, self-focusing and parameters	etric instabilities ar	e explained.
lt	comprises brief introduction into magnetohydrodynamics and nuclear fusion. Basics of atomic physics od multiply-ionized plasmas ar	e introduced.	

12ZPLT	Basic Laser Technique Laboratory	KZ	6
Lasers, solid state	Nd:YAG laser, laser crystal, laser discharge lamp, laser cavity, resonator, free-running, Q-switching, laser amplifier. second harmonic	, He-Ne glow disch	arges, laser
diode, dio	de pumped Nd:YAG laser, CO2 laser marking, laser materials properties, non-linear transmission, laser beam transverse profile, aco	usto-optic modulate	ors.
12ZPOP	Basic Optical Laboratory	KZ	6
Т	he practical laboratories give advanced practical skills by experimental work in optics and optoelectronics. Laboratory records must b	e elaborated.	
14ELMI	Electron Microscopy	Z,ZK	3
In this course the	students are introduced to the microscopic methods used for the characterization of materials, thin layers or nanoparticles. The introd	luctory part is dedic	cated to the
	and electron microscopy and to various types of microscopes. An important part of the course is given to the interaction of different ty	•	
	ulations and tools used in microscopy and to the description of particular parts of the microscopes. Introduction to kinematic and dyna	-	
	, and diffraction and imaging techniques are also covered. A particular attention is given to analytical methods and imaging technique		
14TEM	Engineering Mechanics	Z,ZK	6
Abstract: The cou	se represents a link-up between the theoretical mechanics of rigid bodies and engineering disciplines dealing with stress and strain a	analysis of real stru	cture parts
	(elasticity, plasticity, fracture mechanics, etc.). Principles of statics, kinematics, and dynamics and their application.	7 71	
14TM	Engineering Mechanics	Z,ZK	4
	resents a link-up between the theoretical mechanics of rigid bodies and engineering disciplines dealing with the stress and strain ana		
14ZZKS	Testing and Processing of Metals and Alloys	KZ	4
	ests, hardness, impact toughness, technological testing, fatigue testing, creep testing. Light microscopy, preparation of specimens for velding, soldering, brazing, powder metallurgy, mechanical machining. Copper alloys, aluminium alloys, titanium alloys, special alloys o drawing and CAD.		
15CH1	General Chemistry 1	7	3
	t concepts, quantities and units used in chemistry are introduced in the course General Chemistry I. Their significance and practical u	use are illustrated h	-
	solved in exercises.		.,
15CH2	General Chemistry 2	Z,ZK	3
	continuation of the course General chemistry I. The main attention is paid to general principles governing chemical processes. Using		-
-	e principles is not restricted only to chemical processes is documented. The significance and practical use of explained principles are	-	
, , , , , , , , , , , , , , , , , , , ,	in exercises.	· · · · · · · · · · · · · · · · · · ·	
15CHEM	Analytical Calculations and Chemometry Principals	ZK	2
	h basic principles of chemometry including errors in classical and instrumental analysis, probability theory, propagation of errors, basi		-
	ance testing, hypothesis testing, least squares regression and correlation, calibration and fitting methods, non-parametric testing, sen		
solving, titrati	on stoichiometry of redox, acid-base, complex and precipitation reactions, gravimetric stoichiometry. pH calculations, calculations in p	otentiometry, could	ometry,
	spectrophotometry and separation methods, solving of complex forming equilibria.		
15DALCH	History of Alchemy and Chemistry	ZK	2
This course provi	des the overview of crafts with chemical and/or metallurgical basis. Development of alchemy from ancient times in China, India, and I	lellenistic world is	discussed.
The last part of	course is dedicated to Alchemy in Arabic world and various aspects of alchemy in Latin Europe. The influence of alchemical approact	hes development o	nto crafts
	advancement is illustrated.		
15INPR	Laboratory Practice in Instrumental Methods	KZ	4
-	of students in the use of selected modern instrumental methods and techniques for solving some physico-chemical analytical and oth	-	-
	out in the laboratories of Czech Academy of Sciences (Institute of Physical Chemistry) and partly in laboratory at the Department of		
15ZKJE	Nuclear Power Plants Design and Operation	ZK	3
-	to create basic knowledge of physics of nuclear reactors utilizing fission. Further explains arrangement of nuclear fuel, purpose, technology	-	
	nd construction of all components are defined wit regard to nuclear physics, physics of shielding, theory of regulation, material science tas loggitude for surface of surface o		
	ttes knowledge for evaluation of nuclear safety and radiation protection in nuclear energy, reliability and economy for comparison with o strategic importancy of nuclear sources of energy. Gives basic knowledge of construction, operation and decommissioning of nuclea		
	high level nuclear waste and spent fuel and their management.	i power stations. In	IOTTIS about
16AMMB	Fundamentals of Analytical Measurement Methods	ZK	2
	technical performance and utilization of methods of chemical analysis. Basic methodology of analytical determination, gravimetry, titra		
	ractometry, polarimetry, UV-VIS spectroscopy, atomic emission and absorption spectroscopy, infrared and Raman spectroscopy, X-ra		-
p = = g. = p , . = .	magnetic and electron spin resonance, mass spectrometry, thermometric methods, gas and liquid chromatography.	,,	
16APLB	Application of Ionizing Radiation in Analytical Methods	ZK	5
	ation of ionizing radiation in analytical methods is devoted to radioanalytical methods and the use of radionuclides and ionizing radiatio		
,	of technological processes.		5
16EPAM	Exact Methods in Research of Historic Monuments	ZK	2
	of historic monument investigations, methods of age determination (radiocarbon, thermoluminescence and related methods, further radiati	1	1
	sm), analytical methods for determination of origin and production technologies of artefacts (activation analysis, X-ray fluorescence a		
_	photogrammetry.		
16FNZB	Problems of Non-ionizing Radiation	ZK	2
	d on biological effects of non-ionizing radiation and its use in physical praxis. Information about principles, biological effects and methods	1	1
	resonance and ultrasound as applied in various types of technical or medical equipment are given as well.		
16KPR	Clinical Propaedeutic	ZK	2
Making students fa	miliar with the basics of anamnesis, physical examination, examinational methods of different organs, hematological and biochemical	examinations and a	anaesthesia
16MCRB	Transport of Ionizing Radiation and Monte Carlo Method	Z,ZK	4
	nciples of Monte Carlo method and its use for radiation transport simulation, selected concepts of probability theory and mathematica		
	rent types of radiation and their use for stochastic modeling of their substance transport. Model description concepts, geometric model	-	-
	eling of measured variables and parameters. Statistical evaluation of reliability of modeling results, variance reduction methods, progra		
transport modeling	, MCNP program, its possibilities and use. Procedures for the practical use of the program for typical tasks in the field of dosimetry, a	pplication of ionizir	ng radiation,
40145-5	detection and detection systems, radiation protection and medical applications.		
16MEZB	Fundamentals of Ionizing-Radiation Metrology	Z,ZK	4
	arizes the basic objectives and content of ionizing radiation metrology. It deals with the interpretation of radiation quantities and units i		
ineoretical and ex	perimental foundations of metrology, the determination of basic parameters of radiation. Lectures are supplemented with basic summ	iai y oi reievant legi	isialion and
	regulations.		

16SED1	Dosimetry Seminar 1	Z	2
	upposed to motivate the student's interest in the field of dosimetry, especially in medical physics. Introductory lectures will be devoted		
a bachelor's thesi	s. The following lectures are given by the former students of DDAIR, who are currently employed in various organizations (SÚRO, v.v.i MI, Hospital Na Homolce, FN v Motole, PTC Czech s.r.o.)	., UJF AV R v.v.i.	, UJV eż,
16SED2	Dosimetry Seminar 2	Z	2
	ry 2 follows-up SED1. In this seminary students will listen to the lectures of the older students of DDAIR. The older students give lectur	_	
re	search topic of their theses. The course also introduces the principles of creating good presentation and advice for working with scien	tific literature.	
16UAZB	Principles of Ionizing-Radiation Applications	ZK	2
	of applications, review of interaction of radiation with a matter, radiation sources, detectors and instrumentation, evaluation of radionu		
	and scattering of radiation beams, selected radioanalytical methods, tracer methods, radionuclide dating, further possibilities for the u	-	
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 eneral human anatomy. Basics of medical terminology. Overview of tissues. Skeleton. Muscle anatomy in general. Digestive system a		
	system and physiology of respiration. Excretory and genital tract.	na na physiology. I	Copilatory
16ZBAF2	Fundamentals of Human Biology, Anatomy and Physiology 2	Z.ZK	4
	logy of cardiac activity. General anatomy of blood vessels, main arteries of the body, overview of veins and physiology of blood, blood	,	of nerves.
CN	S. Visual system and physiology of the visual system. Auditory and vestibular system and physiology of hearing and balance. Skin, en	docrine glands.	
16ZDOZ1	Fundamentals of Radiation Dosimetry 1	Z,ZK	4
History, develo	pment, and objectives of dosimetry. Quantities and units used for description of sources, fields, interactions of ionizing radiation, ionization, ionizati	ations, energy tran	sfer and
4070.070	absorption. Fundamentals of the effects of ionizing radiation.	717	-
16ZDOZ2	Fundamentals of Radiation Dosimetry 2	ZK	2
Fundamentals of b	iological effects of ionizing radiation. Quantities and units used in radiation protection. Recommendations of ICRP and ICRU. Principles a in dosimetry. Determination of activity and neutron source emission. Measurements of absorbed dose and exposure.	and methods of me	asurements
16ZEDB	Basics of Experimantal Data Processing	ZK	2
IOZEDB	Statistical analysis of experimental data; univariate data; calibration; regression; multivariate data.	۲N	2
16ZIVB	Introduction to Ecology	KZ	2
-	about basic of the ecologic principles, terms and ideas. It covers overview information regarding to particular components of the enviro		_
	indicators and sustainable development.		
16ZJTB	Nuclear Energy Facilities and Accelerators	ZK	2
Basic scheme of	nuclear reactor and nuclear power plant, chain fission reaction development, main components of nuclear energetic reactor, most im	portant reactor typ	es, linear
high-voltage acc	elerators, linear high-frequency accelerators, accelerators based on cyclotron, microtron, betatron, electron and proton synchrotrons,	electron and ion s	ources for
	accelerators, targets.	_	-
16ZPSP	Basic Work with PC	Z	2
	rse is to acquaint students with the basic skills related to working on a personal computer. The introductory part of the course is devot e at the CTU in Prague and the FNSPE. Emphasis is placed on effective handling of work with office productivity software (text editor,		-
	ercises in MS Office. The practical content focuses mainly on further use during studies (laboratory reports, research work, bachelor's	•	
	ospitals, state administration, companies). Other sections summarize basic information about computer hardware, software, and secur	-	
	home exercises and participation in exercises above 60% is a necessary condition for passing the course.		
16ZRAO	Basics of Radiation Protection	Z	2
	rse is to familiarize students with the general principles of radiation protection. The main emphasis is put on basic mechanisms and cor	-	
	field. The course provides answers to the cardinal questions: What is ionizing radiation (IR), where it comes from, whether and how it ng of protective units (Gray, Sievert), how to prevent malicious effect of IR and many others. The content of the lectures does not requ		-
17ENF	Experimental Neutron Physics	KZ	2
	mainly focused on detailed characterisation of neutron properties, characteristics of neutron (reactor and non reactor) sources, properties		
	a detection methods, neutron induced nuclear reactions, modification and adjustment of neutron field, science and industry neutron ap		-
with experimental of	data processing and analysis. The lectures are supplemented with experimental practices in the field of neutron detection, determination	of delayed neutror	properties,
study of neutron di	ffusion in various materials, preparation and characterisation of photo-neutron source and neutron source calibration. Experimental prac	tices will be runnin	g at training
	reactor VR-1 and in the neutron laboratory.		
17JARE	Nuclear Reactors	ZK	2
	I power issue. Previous evolution of power reactor. Nuclear fission reactors, fuel assemblies, active core, control systems, safety system generations. Standard types of nuclear power reactors: concept, description, layout, previous evolution, world share, perspectives. Pres		
	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		
and	selection of proposed systems. Six selected concepts. ICRP scenarios of word evolution, hydrogen power, role of nuclear power in lo	ng-term outlook	
17UINZ	Introduction to Engineering	Z,ZK	3
	oted to an introduction to the engineering profession. Students will gradually learn the characteristics and specialties of engineering w	-	
the basics of sele	cted engineering disciplines, such as the basics of materials science, manufacturing technology, quality control and assurance and ec		course will
	focus on some issues of R&D activities organization and on selected parts of technical drawings and the work with AutoCAL		0
17VYR Course is devoted	Research Reactors to research reactors and their applications for the need of research and industry. Students get familiar with research reactor types and	ZK their experimental	2 programme
	th experimental equipment needed for particular applications and their specifics. The course is supported by technical visit to research	-	
17ZEH	Basics of Economic Assessment	ZK	2
	uses on the economic evaluation of Nuclear power plants. Introductory lectures are concerned with an introduction to economy and th		
	ectures continued with insight into the business and managerial economics, explanation of the concepts of incomes, expenses, etc. and	-	-
	energy resources evaluation. Second part of lectures is focused on evaluation of nuclear power plants - the fuel cycle and operation		
17ZEL	Basics of Electronics	KZ	3
-	basic information of electronics. In the beginning, lectures are devoted to passive components - resistors, capacitors, inductors and so		
-	es deal with semiconductor components (standard, Zener, capacitive, LED), bipolar, unipolar transistors and semiconductor componer ures continue with general amplifiers and operational amplifiers. Finally, lectures deal with digital circuits, digital/analog and analog/dig		
	completed with electronic laboratory exercises.		

18BPSE1	Bachelor Thesis 1	Z	5
	ct is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the proj	_	-
	regular meetings and discussions.		
18BPSE2	Bachelor Thesis 2	Z	10
The bachelor project	t is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the proj	ect supervisor duri	ng common
	regular meetings and discussions.		
18EKO1	Mathematical Economics 1	Z,ZK	5
The course introdue	ces selected models and methods for economic decision making. The main attention is given to optimization models of linear program	nming, possibilities	of their real
	applications and their solving by means of the current software products.	7 71/	
18EKO2	Mathematical Economics 2 duces selected models and methods for economic decision making. The main attention is given to optimization models in graphs, pro	Z,ZK	5
	management with deterministic and stochastic demand, queuing theory and simulation models.	ject management,	Inventory
18EKONS	Econometrics	Z,ZK	5
	sed on economic theory and the relations between economic quantities are expressed by mathematical tools and observed data fror		- 1
	ments of econometric analysis as the basic econometric model, the generalized model and the system of simultaneous equations an		
	model verification.		
18ESPG1	European Computer Driving Licence 1	Z	2
Spreadsheet calcul	ators are an important tool, especially for students and graduates in Software engineering in economics. The winter semester introduc	es the students als	so into other
office tools. The ad	ccent is put on advanced functions of MS Excel (names, functions and expressions, pivot table and graph). Next, the VBA language v	vill be introduced a	ind macros
	and user functions will be addressed.		
18ESPG2	European Computer Driving Licence 2	Z	2
	ators are an important tool, especially for students and graduates in Software engineering in economics. Summer semester follows the		
VBA programming	g topics (charts, objects, graphical user interface, add-ins programming) and introduces some applications in economics, mathematic computer science.	cs, operational rese	earcn, and
		KZ	4
18INTA	Development of internet applications le an overview of modern technologies for the development of web applications. Students will learn basic web languages and concep		
· ·	ced to relational database systems. The tutorials are dedicated to practical examples of building web applications, from the simplest i		, ,
	is oriented primarily towards backend technologies and using the Python languages, but covers also frontend frameworks and Jav		
18MAK1	Macroeconomics 1	Z,ZK	4
-	I provides students with a fundamental theoretical basis for understanding how an economy works. It introduces main macroeconom		ey market,
macroeconomic eq	uilibrium theory, fundamentals of open economy theory, inflation, unemployment, economic growth, economic fluctuations, basic man	croeconomic mode	els of IS-LM,
AS-AD and their im	plications for economic policies. The learning outcomes of the course is to equip students with ability to analyze macroeconomic phenom	nena and their inter	connections
	and subsequently to use them under the conditions of modern economic life.		
18MAK2	Macroeconomics 2	Z,ZK	4
	Il extends theoretical knowledge acquired from Macroeconomics I of its students with the latest knowledge of contemporary macroeconomics I of its students with the latest knowledge of contemporary macroeconomics I of its students with the latest knowledge of contemporary macroeconomics I of its students with the latest knowledge of contemporary macroeconomics I of its students with the latest knowledge of contemporary macroeconomics I of its students with the latest knowledge of contemporary macroeconomics I of its students with the latest knowledge of contemporary macroeconomics I of its students with the latest knowledge of contemporary macroeconomics I of its students with the latest knowledge of contemporary macroeconomics I of its students with the latest knowledge of contemporary macroeconomics I of its students with the latest knowledge of contemporary macroeconomics I of its students with the latest knowledge of contemporary macroeconomics I of its students with the latest knowledge of contemporary macroeconomics I of its students with the latest knowledge of contemporary macroeconomics I of its students with the latest knowledge of contemporary macroeconomics I of its students with the latest knowledge of contemporary macroeconomics I of its students with the latest knowledge of contemporary macroeconomics I of its students with the latest knowledge of contemporary macroeconomics I of its students with the latest knowledge of contemporary macroeconomics I of its students with the latest knowledge of contemporary macroeconomics I of its students with the latest knowledge of contemporary macroeconomics I of its students with the latest knowledge of contemporary macroeconomics I of its students with the latest knowledge of contemporary macroeconomics I of its students with the latest knowledge of contemporary macroeconomics I of its students with the latest knowledge of contemporary macroeconomics I of its students with the latest knowledge of contemporary macroeconomics I of its students with the latest		e models of
economic growin,			f a a a maine
modeling i e maci	especially those with an emphasis on the role of human capital and technological progress. Furthermore, it introduces students to m		
modeling, i.e., macr	roeconomic models derived from microeconomic behavior of subjects and economics and their rational expectations. It also provides stu		
_	roeconomic models derived from microeconomic behavior of subjects and economics and their rational expectations. It also provides stu- of labor market modeling.	udents with moderr	n knowledge
18MIK1	roeconomic models derived from microeconomic behavior of subjects and economics and their rational expectations. It also provides stu	udents with moderr	h knowledge
18MIK1 Microeconomics is	roeconomic models derived from microeconomic behavior of subjects and economics and their rational expectations. It also provides stu- of labor market modeling. Microeconomics 1	Udents with moderr Z,ZK economics explain	h knowledge 5 s the role of
18MIK1 Microeconomics is prices and marke	roeconomic models derived from microeconomic behavior of subjects and economics and their rational expectations. It also provides stu- of labor market modeling. Microeconomics 1 a set of theories, which help us to understand processes by which the scarce resources are allocated among alternative uses. Micro ets in these processes, and makes more clear behaviour of the economic agents. This course of Microeconomics I consist of introduc Consumer Theory.	Z,ZK Z,ZK economics explain ction in Microeconc	h knowledge 5 s the role of
18MIK1 Microeconomics is	roeconomic models derived from microeconomic behavior of subjects and economics and their rational expectations. It also provides stu- of labor market modeling. Microeconomics 1 a set of theories, which help us to understand processes by which the scarce resources are allocated among alternative uses. Micro ets in these processes, and makes more clear behaviour of the economic agents. This course of Microeconomics I consist of introduc	Udents with moderr Z,ZK economics explain	h knowledge 5 s the role of
18MIK1 Microeconomics is prices and marke 18MIK2 Microeconomics is	roeconomic models derived from microeconomic behavior of subjects and economics and their rational expectations. It also provides stu- of labor market modeling. Microeconomics 1 a set of theories, which help us to understand processes by which the scarce resources are allocated among alternative uses. Micro ets in these processes, and makes more clear behaviour of the economic agents. This course of Microeconomics I consist of introduc Consumer Theory. Microeconomics 2 a set of theories, helping us to understand process by which scarce resources are allocated among alternative uses. Microeconomics 2	Z,ZK conomics explain ction in Microecono Z,ZK s explain the role o	h knowledge 5 s the role of prics and 5 f prices and
18MIK1 Microeconomics is prices and marke 18MIK2 Microeconomics is markets i	reconsister models derived from microeconomic behavior of subjects and economics and their rational expectations. It also provides studies of labor market modeling. Microeconomics 1 a set of theories, which help us to understand processes by which the scarce resources are allocated among alternative uses. Microeconomic agents. This course of Microeconomics I consist of introduce Consumer Theory. Microeconomics 2 a set of theories, helping us to understand processes by which scarce resources are allocated among alternative uses. Microeconomics 1 a set of theories, helping us to understand process by which scarce resources are allocated among alternative uses. Microeconomics 1 microeconomics 2 a set of theories, helping us to understand process by which scarce resources are allocated among alternative uses. Microeconomics not this process and make clear economic agents behaviour. The lectures of Microeconomics II are oriented on Theory of Firm and Income	Z,ZK economics explain tion in Microecono Z,ZK s explain the role o lustrial Organisatio	h knowledge 5 s the role of omics and 5 if prices and n.
18MIK1 Microeconomics is prices and market 18MIK2 Microeconomics is markets i 18MPT	reconstruction of subjects and economics and their rational expectations. It also provides studies of labor market modeling. Microeconomics 1 a set of theories, which help us to understand processes by which the scarce resources are allocated among alternative uses. Microeconomics and their rational expectations is a set of theories, and makes more clear behaviour of the economic agents. This course of Microeconomics I consist of introduce Consumer Theory. Microeconomics 2 a set of theories, helping us to understand process by which scarce resources are allocated among alternative uses. Microeconomics not the scarce resources are allocated among alternative uses. Microeconomics 1 Microeconomics 2 A set of theories, helping us to understand process by which scarce resources are allocated among alternative uses. Microeconomics not this process and make clear economic agents behaviour. The lectures of Microeconomics II are oriented on Theory of Firm and Inco Programming in MATLAB	Z,ZK economics explain ction in Microecono Z,ZK s explain the role o lustrial Organisatio KZ	h knowledge 5 s the role of omics and 5 f prices and n. 5
18MIK1 Microeconomics is prices and market 18MIK2 Microeconomics is markets i 18MPT	The process and make clear economic agents behaviour. The lectures of Microeconomics II are oriented on Theory of Firm and Incomparing in MATLAB The programming in MATLAB The programming techniques in the Matlab environment. The emphasis is placed on the differences in programming techniques in the Matlab environment. The emphasis is placed on the differences in programming techniques in the Matlab environment. The emphasis is placed on the differences in programming techniques in the Matlab environment. The emphasis is placed on the differences in programming techniques in the Matlab environment. The emphasis is placed on the differences in programming techniques in the Matlab environment. The emphasis is placed on the differences in programming techniques in the Matlab environment. The emphasis is placed on the differences in programming techniques in the Matlab environment. The emphasis is placed on the differences in programming techniques in the Matlab environment.	Z,ZK economics explain ction in Microecono Z,ZK s explain the role o lustrial Organisatio KZ	h knowledge 5 s the role of omics and 5 f prices and n. 5
18MIK1 Microeconomics is prices and market 18MIK2 Microeconomics is markets i 18MPT The subject acqua	The process and make clear economic agents behaviour. The lectures of Microeconomics II are oriented on Theory of Firm and Incompared to classical languages.	Z,ZK economics explain tion in Microecono Z,ZK s explain the role o lustrial Organisatio KZ mming methodolog	n knowledge 5 s the role of omics and 5 f prices and on. 5 y in Matlab
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18WEB	Markup Languages for WWW	KZ	3
The lectures cover	markup languages used in the www environment. It's focused on standards and recommendations of formats descriptions of www. T	he lectures also of	ffer practical
	touch of all interesting parts.		
18ZALG	Basics of Algorithmization	Z,ZK	4
This course is	devoted to selected algorithms and methods for algorithm design. This course intruduces selected methods for the determination of	the algorithm com	plexity.
18ZNEK	Knowledge Economics	KZ	3
	Knowledge Economy is concerned with problems of education and human capital related to economics.		•
18ZPRO	Basics of Programming	Z	4
This course is i	ntended mainly for students with little or no experience in programming. It familiarizes the students with the basic concepts in program	nming and with the	e Python
	programming language.		
TV-1	Physical Education	Z	1
TV-2	Physical Education	Z	1
TV-3	Physical education	Z	1
TV-4	Physical education	Z	1

For updated information see <u>http://bilakniha.cvut.cz/en/FF.html</u> Generated: day 2024-05-17, time 04:30.