

# Study plan

## Name of study plan: Aplikovaná informatika

Faculty/Institute/Others:

Department:

Branch of study guaranteed by the department: Welcome page

Garantor of the study branch:

Program of study: Applied Informatics

Type of study: Bachelor full-time

Required credits: 0

Elective courses credits: 180

Sum of credits in the plan: 180

Note on the plan:

Name of the block: Compulsory courses in the program

Minimal number of credits of the block: 0

The role of the block: P

Code of the group: BSPAPIN1

Name of the group: BS P\_APIN 1st year

Requirement credits in the group:

Requirement courses in the group: In this group you have to complete at least 19 courses

Credits in the group: 0

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
02DEF1	<b>History of Physics 1</b> Igor Jex Igor Jex (Gar.)	Z	2	2+0	Z	P
02FY1	<b>Physics 1</b> Jaroslav Biel ík Jaroslav Biel ík Jaroslav Biel ík (Gar.)	Z,ZK	4	2P+2C	Z	P
02FY2	<b>Physics 2</b> Jaroslav Biel ík Jaroslav Biel ík Jaroslav Biel ík (Gar.)	Z,ZK	4	2P+2C	L	P
01MATZ1	<b>Mathematics, Examination 1</b> Radek Fu ík Radek Fu ík Radek Fu ík (Gar.)	ZK	2	-	Z	P
01MATZ2	<b>Mathematics, Examination 2</b> Radek Fu ík, Mat j Tušek Mat j Tušek Radek Fu ík (Gar.)	ZK	2	-	L	P
01MAT1	<b>Mathematics 1</b> Radek Fu ík Radek Fu ík Radek Fu ík (Gar.)	Z	4	3P+3C	Z	P
01MAT2	<b>Mathematics 2</b> Radek Fu ík Radek Fu ík Radek Fu ík (Gar.)	Z	4	3P+3C	L	P
00PT	<b>Preparatory Week</b> Petr Ambrož, Milan Krbálek Petr Ambrož Petr Ambrož (Gar.)	Z	2	týden	Z	P
04APKK	<b>Course in Communication Skills - Examination</b> Slav na Brownová, Nathaniel Patton	ZK	1		L	P
04APK1	<b>Course in Communication Skills 1</b> Jana Ková ová	Z	2	2S	Z	P
04APK2	<b>Course in Communication Skills 2</b>	Z	2	2S	L	P
04APS1	<b>Course in Language Structures 1</b> Jana Ková ová	KZ	3	2S	Z	P
04APS2	<b>Course in Language Structures 2</b> Nathaniel Patton	KZ	3	2S	L	P
04APUK	<b>Introduction to English for Specific Purposes - Examination</b> Slav na Brownová, Nathaniel Patton Jana Ková ová	ZK	1		L	P
04APU1	<b>Introduction to English for Specific Purposes 1</b> Jana Ková ová Jana Ková ová (Gar.)	Z	2	2S	Z	P
04APU2	<b>Introduction to English for Specific Purposes 2</b> Jana Ková ová	Z	2	2S	L	P
12UNXAP	<b>Introduction to UNIX</b> Milan Kucha ík Milan Kucha ík Milan Kucha ík (Gar.)	Z	2	1P+1C	L	P

18ZALG	<b>Basics of Algorithmization</b> <i>Jan Tomsa, Petr Pauš, Vladimír Jarý, František Vold ich, Miroslav Virius, František Gašpar, Zuzana Pet í ková Vladimír Jarý Miroslav Virius (Gar.)</i>	Z,ZK	4	2+2	L	P
18ZPRO	<b>Basics of Programming</b> <i>Jan Tomsa, Petr Pauš, Vladimír Jarý, František Vold ich, Miroslav Virius, Zuzana Pet í ková, Nichita Vatamaniuc, Jan Vondruška, Maksym Dreval, ..... Miroslav Virius Miroslav Virius (Gar.)</i>	Z	4	4C	Z	P

**Characteristics of the courses of this group of Study Plan: Code=BSPAPIN1 Name=BS P \_APIN 1st year**

02DEF1	History of Physics 1 Physics and its place in the system of sciences. The relationship of man and nature. Natural sciences in ancient Orientand Greece, Greek natural philosophers, Aristotle. Physics in Hellenistic period, Archimed. Arabic science, European science in Middle Ages. Renaissance - da Vinci, Giordano Bruno. Copernicus, Kepler, Galileo, Huygens. The birth of physics as experimental science. Newton and his work.	Z	2
02FY1	Physics 1 History, principles and applications of mechanics, waves and thermodynamics ? basic level. The lecture is supplemented with practical investigation and demonstration of selected physical phenomena.	Z,ZK	4
02FY2	Physics 2 Thermodynamics, electricity and magnetism, modern physics. The lecture is supplemented with practical investigation and demonstration of selected physical phenomena.	Z,ZK	4
01MATZ1	Mathematics, Examination 1	ZK	2
01MATZ2	Mathematics, Examination 2	ZK	2
01MAT1	Mathematics 1 The course is devoted to the study of the basics of calculus of one variable. It includes an introduction to differential and integral calculus, with particular emphasis on applications in practical problems.	Z	4
01MAT2	Mathematics 2 The course, which is the continuation of Mathematics 1, is devoted to the integration techniques, improper Riemann integral, introduction to parametric curves (especially in polar coordinates), the basics of sequences and infinite series, and finally to the Taylor and power series and their applications.	Z	4
00PT	Preparatory Week	Z	2
04APKK	Course in Communication Skills - Examination The course content is the examination as given by the study plan. The examination tests how well student has mastered vocabulary and facts of courses 04APK1 and 04APK2. The examination consists of two parts - written (duration 100 minutes), and oral (about 30 minutes).	ZK	1
04APK1	Course in Communication Skills 1 The course will develop communication strategy and skills of student acquired at secondary school or elsewhere. Competence at B1 level of CEFR is a prerequisite for registering for the course. It runs for 3 semesters, being a core course of the Applied Information Technology programme. It will develop student's communication skills in an integral form (e.g., listening and discussion on a topic). The list of topics is similar to that of the State Language Examination. Student will develop their vocabulary for various communication situations and will master their communication strategy. He/she will be trained to express his/her ideas clearly and according to current English usage.	Z	2
04APK2	Course in Communication Skills 2 The course is also concerned with developing speaking skills in English acquired at secondary school and course 04APK1. Speaking skills will be trained alongside listening skills. Topics will concentrate on everyday life and cover topics of the State Language Examination, stressing mastery of speaking strategy in various situations. The course will emphasise developing student's vocabulary, ability to express thoughts with accuracy in correct English.	Z	2
04APS1	Course in Language Structures 1 The course is designed to instruct how to correctly use and to revise English grammar structures acquired by student at secondary school, develop them, view them as a system of communication and strengthen them. The required level for registration is B1 of CEFR. The course stresses mainly frequency of structures and those difficult to master by Czech students.	KZ	3
04APS2	Course in Language Structures 2 The course 04APS2 is a sequel to course 04APS1. Its purpose is also to correctly use and revise further English grammar structures as acquired and develop them.	KZ	3
04APUK	Introduction to English for Specific Purposes - Examination The course content is the examination as given by the study plan. Examination 04APUK consists of two parts - written part (duration 100 minutes) and oral part (duration about 30 minutes) and covers a 2-semester programme. To be eligible for examination, student will have passed courses 04APU1 and 04APU2 and the examination test in written part. Student has to prove he/she can use the acquired basic knowledge and skills typical of English for Specific Purposes (ESP).	ZK	1
04APU1	Introduction to English for Specific Purposes 1 The course will introduce student into English for Specific Purposes (ESP) and acquaint him/her with its functions in subtechnical or easy technical texts. It brings vocabulary and functions typical of ESP and it introduces student to basic mathematics and information technology terms.	Z	2
04APU2	Introduction to English for Specific Purposes 2 The course 04APU2 is a sequel to course 04APU1, concentrating more thoroughly on ESP text content, text grammar and vocabulary. It introduces more advanced functions typical of ESP and more advanced information technology terms.	Z	2
12UNXAP	Introduction to UNIX Computer and operating systems. Personal computer, workstation and supercomputers. Processor, memory, bus, devices, hard disk, network interface. Hardware and software. Principles of operating systems. Operating system UNIX. Basic principles, kernel, kernel services. Documentation. File system, file attributes, working with files. Text editors: vi, emacs. Command interpreter (shell) bash and its programming (scripts). Controlling processes, process status, computer load a process priorities. Standard tools. Graphical user interface X-windows. Computer networks. Local computer networks. Global computer networks. Addresses and protocols TCP/IP. Network configuration of a computer. Network services: hardware sharing, mail, scp, etc. Network applications	Z	2
18ZALG	Basics of Algorithmization This course is devoted to selected algorithms and methods for algorithm design. This course intruduces selected methods for the determination of the algorithm complexity.	Z,ZK	4
18ZPRO	Basics of Programming This course is intended mainly for students with little or no experience in programming. It familiarizes the students with the basic concepts in programming and with the Python programming language.	Z	4

Code of the group: BSPAPIN2

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

Requirement credits in the group:

Requirement courses in the group: In this group you have to complete at least 20 courses

Credits in the group: 0

Note on the group:

Zápis do kurzu 04APO1 se důrazně doporučuje až po získání zápočtu z 04APS2. Zápis do kurzu 04APA je podmíněn složením zkoušky z předmětu 04APS3.

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
04APA	Course in Applied English Usage	Z	1	2S	L	P
04APAK	Course in Applied English Usage - Examination Nathaniel Patton	ZK	2		L	P
01DIM1	Discrete Mathematics 1 Edita Pelantová, Zuzana Masáková, Lubomíra Dvořáková <b>Lubomíra Dvořáková</b> Zuzana Masáková (Gar.)	Z	2	2P+0C	Z	P
01DIM2	Discrete Mathematics 2 Edita Pelantová, Zuzana Masáková <b>Zuzana Masáková</b> Zuzana Masáková (Gar.)	Z	2	2P+0C	L	P
04APR1	Life and Institutions of English-speaking Countries and the CR 1 <b>Jana Ková ová</b>	Z	2	2S	L	P
01MAT3	Mathematics 3 Miroslav Kolář, David Krejčí, Severin Pošta <b>David Krejčí</b> David Krejčí (Gar.)	Z,ZK	4	2+2	Z	P
01MAT4	Mathematics 4 Matěj Tušek <b>Matěj Tušek</b> Matěj Tušek (Gar.)	Z,ZK	4	2+2	L	P
12PAS	Computer Algebra Systems Milan Šišor <b>Milan Šišor</b> Milan Šišor (Gar.)	Z	2	1P+1C	Z	P
04APO1	Text Analysis and Comprehension <b>Jana Ková ová</b>	Z	2	2S	Z	P
04APOK	Text Analysis and Comprehension - Examination Jana Ková ová <b>Jana Ková ová</b>	ZK	1		L	P
04APO2	Text Analysis and Comprehension 2 <b>Jana Ková ová</b>	Z	1	2S	L	P
18PRC1	Programming in C++ 1 Vladimír Jarý, Miroslav Virius <b>Miroslav Virius</b> Miroslav Virius (Gar.)	Z	4	2+2	Z	P
18PRC2	Programming in C++ 2 Vladimír Jarý, Miroslav Virius, Jakub Klínek <b>Miroslav Virius</b> Miroslav Virius (Gar.)	KZ	4	2+2	L	P
18PJ	Programming in Java Miroslav Virius <b>Miroslav Virius</b> Miroslav Virius (Gar.)	Z,ZK	5	2P+2C	Z	P
04AP3KK	Course in Communication Skills - Final Examination Nathaniel Patton <b>Jana Ková ová</b>	ZK	2		Z	P
04APK3	Course in Communication Skills 3 <b>Jana Ková ová</b>	Z	1	2S	Z	P
04APSK	Course in Language Structures - Final Examination Nathaniel Patton <b>Jana Ková ová</b>	ZK	2		Z	P
04APS3	Course in Language Structures 3 <b>Jana Ková ová</b>	Z	1	2S	Z	P
18INTA	Development of internet applications Jakub Klínek, Dana Majerová <b>Dana Majerová</b> Dana Majerová (Gar.)	KZ	4	2P+2C	L	P
12UVP	Introduction to Scientific Computing Milan Šišor <b>Milan Šišor</b> Milan Šišor (Gar.)	Z	2	1P+1C	L	P

**Characteristics of the courses of this group of Study Plan: Code=BSPAPIN2 Name=BS P \_APIN 2nd year**

04APA	Course in Applied English Usage	Z	1	To sign in for the course, student will have passed final examination in Course in Language Structures (04APSK). The course concludes study of grammar structures and applies them to understanding everyday and ESP language situations, laying stress on choice of exact and adequate language and grammar structures in both English-Czech and Czech-English translations..
04APAK	Course in Applied English Usage - Examination	ZK	2	The course content is the examination as given by the study plan. Written and oral parts of the examination test skills and knowledge acquired in course 04APA. Duration: written part - 100 minutes, oral part - ca 30 minutes.
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.
04APR1	Life and Institutions of English-speaking Countries and the CR 1	Z	2	The course is aimed at preparing the student for the state language examination and is based on topics required for this examination. Great emphasis is placed on training oral presentation of facts about English speaking-countries in comparison with the Czech Republic. The course covers one third of topics for the state language examination.
01MAT3	Mathematics 3	Z,ZK	4	The subject summarises the most important notions and theorems related to the study of finite-dimensional vector spaces.
01MAT4	Mathematics 4	Z,ZK	4	Linear and non-linear differential equations of the first order. Linear differential equations of higher order with constant coefficients. Multivariable calculus and its applications.
12PAS	Computer Algebra Systems	Z	2	Practically oriented introduction to computer algebra systems (CAS): their main characteristics, ways and means of using them. Constituent part is realized in computer classrooms: students acquire basic skills with CAS by solving relatively simple and basic tasks from mathematics and physics.

04APO1	Text Analysis and Comprehension	Z	2
The course is a sequel to the 04APU1 and 04APU2 courses and students will have successfully passed the 04APS2 course. It focuses on further written functions specific to English for Specific Purposes (ESP). Increasing attention is given to extending subtechnical vocabulary, text grammar and text comprehension. Students are taught how to use formal language in written and oral communication.			
04APOK	Text Analysis and Comprehension - Examination	ZK	1
The course content is the examination as given by the study plan. To be eligible to take the examination students will have successfully completed the 04APO1 and 04APO2 courses. The examination consists of two parts: written (duration 100 minutes) and oral (about 30 minutes). Students will prove they can use and apply the knowledge and skills acquired in both courses.			
04APO2	Text Analysis and Comprehension 2	Z	1
The course is a sequel to course 04APO1 and focuses on guided writing (e.g., note-taking, précis, abstract). It is intended as preparation for writing the bachelor's project by developing text grammar practice and acquainting with basics of English punctuation.			
18PRC1	Programming in C++ 1	Z	4
This course covers mainly 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 other advanced constructs in the C++; programming language and the Standard Template Library.			
18PJ	Programming in Java	Z,ZK	5
This course is devoted to the Java platform and to the development of the basic types of applications for this platform.			
04AP3KK	Course in Communication Skills - Final Examination	ZK	2
The course content is the examination as given by the study plan. Final examination 04AP3KK covers syllabi of all three courses in communication skills. It is usually oral, but a written test may be administered. Examination requirements are similar to those of state examination. Student will be able to engage in communication and discussion on a given topic, using appropriate vocabulary and grammar structures.			
04APK3	Course in Communication Skills 3	Z	1
The last semester of conversation course. Student will further develop his/her speaking skills to be able to use English competently, speak about topics covered by previous courses without making mistakes and making use of appropriate vocabulary.			
04APSK	Course in Language Structures - Final Examination	ZK	2
The course content is the examination as given by the study plan. To register for final examination 04APSK student will have passed a 3-semester programme comprising courses 04APS1, 04APS2, and 04APS3. It consists of two parts: written (duration 100 minutes) and oral (duration about 30 minutes). Student will demonstrate he/she has mastered English grammar and can reliably use it in practice as well as explain why a rule applies.			
04APS3	Course in Language Structures 3	Z	1
The course 04APS3 is a sequel to course 04APS2. Its purpose is also to correctly use and revise further English grammar structures as acquired by student, to develop them and use in practice.			
18INTA	Development of internet applications	KZ	4
The lectures provide an overview of modern technologies for the development of web applications. Students will learn basic web languages and concepts (HTML, URL, etc.) and they will also be introduced to relational database systems. The tutorials are dedicated to practical examples of building web applications, from the simplest to more advanced. The course is oriented primarily towards backend technologies and using the Python languages, but covers also frontend frameworks and JavaScript.			
12UVP	Introduction to Scientific Computing	Z	2
Practically oriented Introduction to scientific computing. Constituent part of the course is realized in computer classroom. Students get acquainted with some basic tools for scientific and technical computing, data analysis, data visualisation and algorithm development.			

Code of the group: BSPAPIN3

Name of the group: BS P\_APIN 3rd year

Requirement credits in the group:

Requirement courses in the group: In this group you have to complete at least 18 courses

Credits in the group: 0

Note on the group: Předmět 04API je důrazně doporučeno zapsat až po splnění zkoušek 04APOK a 04APAK.) Předmět 04APJP lze zapsat až po splnění všech zápočtů a zkoušek pěti semestrů 1.-3. ročníku studia angličtiny. Předmět 01BPAI2 lze zapsat až po složení zkoušky z předmětu 04APSK.

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
01BPAI1	<b>Bachelor's Degree Project 1</b> <i>Pavel Strachota, Václav K s Pavel Strachota Pavel Strachota (Gar.)</i>	Z	5	0+5		P
01BPAI2	<b>Bachelor's Degree Project 2</b> <i>Pavel Strachota Pavel Strachota Pavel Strachota (Gar.)</i>	Z	10	0+10		P
01EIG	<b>Elementary Introduction to Graph Theory</b> <i>Petr Ambrož, Zuzana Masáková Petr Ambrož Edita Pelantová (Gar.)</i>	ZK	3	2P+0C		P
04JPBP	<b>Language Support to Bachelor Project</b> <i>Jana Ková ová Jana Ková ová (Gar.)</i>	Z	3	2S	L	P
04APJP	<b>Language Support to Bachelor Project</b> <i>Nathaniel Patton, Darren Copeland Jana Ková ová</i>	Z	5	5S	L	P
04APRK	<b>Life and Institutions of English-speaking Countries and the CR - Examination</b> <i>Nathaniel Patton Jana Ková ová</i>	ZK	3		Z	P
04APR2	<b>Life and Institutions of English-speaking Countries and the CR 2</b> <i>Jana Ková ová</i>	Z	2	4S	Z	P
01PGR1	<b>Computer Graphics 1</b> <i>Pavel Strachota Pavel Strachota Pavel Strachota (Gar.)</i>	Z,ZK	2	1P+1C		P

01PGR2	<b>Computer Graphics 2</b> <i>Pavel Strachota Pavel Strachota Pavel Strachota (Gar.)</i>	Z,ZK	2	1P+1C		P
01SITE1	<b>Computer Networks 1</b> <i>Miroslav Minárik Miroslav Minárik Miroslav Minárik (Gar.)</i>	Z	2	1+1	Z	P
01SITE2	<b>Computer Networks 2</b> <i>Miroslav Minárik Miroslav Minárik Miroslav Minárik (Gar.)</i>	Z	2	1+1	L	P
04API	<b>Presentation Course</b> <i>Jana Ková ová</i>	Z	2	2S	Z	P
01PW	<b>Windows Programming</b> <i>Zden k ulík Zden k ulík Zden k ulík (Gar.)</i>	Z	2	2+0	Z	P
01BASE	<b>Bachelor Seminar</b> <i>Pavel Strachota Pavel Strachota (Gar.)</i>	Z	1	0P+2S		P
01UOP	<b>Introduction to Object Programming</b> <i>Zden k ulík Zden k ulík Zden k ulík (Gar.)</i>	ZK	2	0+2		P
01UP1	<b>Introduction to Probability 1</b> <i>Jan Vybíral Jan Vybíral Jan Vybíral (Gar.)</i>	Z,ZK	3	1P+1C		P
01UP2	<b>Introduction to Probability 2</b> <i>Milan Krbálek, Michaela Krbáková Michaela Krbáková Milan Krbálek (Gar.)</i>	Z,ZK	3	1P+1C		P
01UTEI	<b>Introduction to Theoretical Informatics</b> <i>Petr Ambrož Petr Ambrož Petr Ambrož (Gar.)</i>	ZK	3	2P+0C		P
01ZAOS	<b>Introduction to Operating Systems</b> <i>Zden k ulík Zden k ulík Zden k ulík (Gar.)</i>	Z,ZK	2	2+0	L	P

### Characteristics of the courses of this group of Study Plan: Code=BSPAPIN3 Name=BS P APIN 3rd year

01BPAI1	Bachelor's Degree Project 1 Bachelor's Degree project on the selected topic under the supervision. Supervision and regular checking of the bachelor project under preparation.			Z		5
01BPAI2	Bachelor's Degree Project 2 Bachelor's Degree project on the selected topic under the supervision. Supervision and regular checking of the bachelor project under preparation.			Z		10
01EIG	Elementary Introduction to Graph Theory The course provides an explanation of basics of graph theory, followed by a survey of common graph algorithms.			ZK		3
04JPBP	Language Support to Bachelor Project To sign in for the course students will have passed all the English courses from the previous 5 semesters. The course instructs students in the strategy of writing, submitting, presenting, and defending the Bachelor Project in English. Their progress is continuously monitored and assessed. To finish the course, students will give a presentation of their Bachelor Project.			Z		3
04APJP	Language Support to Bachelor Project To sign in for the course students will have passed all the English courses from the previous 5 semesters. The course instructs students in the strategy of writing, submitting, presenting, and defending the Bachelor Project in English. Their progress is continuously monitored and assessed. To finish the course, students will give a presentation of their Bachelor Project.			Z		5
04APRK	Life and Institutions of English-speaking Countries and the CR - Examination The course content is the examination as given by the study plan. To be eligible to take the examination students will have successfully completed the 04APR1 and 04APR2.courses The examination consists of two parts: written (duration 100 minutes) and oral (about 30 minutes). Students will prove they can use and apply the knowledge and skills acquired in both courses.			ZK		3
04APR2	Life and Institutions of English-speaking Countries and the CR 2 The course following the 04APR1 course is again aimed at preparing the student for the state language examination and is based on topics required for this examination. Great emphasis is placed on training oral presentation of facts about English speaking-countries in comparison with the Czech Republic. The course covers two remaining thirds of topics for the state language examination.			Z		2
01PGR1	Computer Graphics 1 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 state of the art technologies. Further, a survey of fundamental problems in 2D computer graphics is given together with their solutions. Focus is put on mathematical description of problems and explanation of the corresponding algorithms using knowledge previously obtained in a variety of subjects available at FNSPE. The final part of the course covers the applications of computer graphics approaches in the process of authoring scientific documents and presentations.			Z,ZK		2
01PGR2	Computer Graphics 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 phenomenon ubiquitous in computer graphics. Further, a well structured survey of fundamental problems in 3D computer graphics is given together with their solutions, from the description of a 3D scene to its realistic rendering. Focus is put on mathematical description of problems and explanation of the corresponding algorithms using knowledge previously obtained in a variety of subjects available 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 theoretical concepts are demonstrated using Blender, an open-source 3D modeling and rendering software instrument.			Z,ZK		2
01SITE1	Computer Networks 1 Understanding the history and present network (LAN, WAN, use the principles and technologies). Architecture of reference model ISO/OSI. Network protocols, practical exercises with TCP/IP communications. Internet services - mail, remote access, www. Secure communication, tunneling. Directory services, certificates, certification authorities, public key infrastructure (PKI). Use in practice. Network security - firewalls (packet filters, proxies, gateways, NAT, DMZ), practical exercises. (According to the interest - the serial control lines, modems)			Z		2
01SITE2	Computer Networks 2 Understanding the history and present network (LAN, WAN, use the principles and technologies). Architecture of reference model ISO/OSI. Network protocols, practical exercises with TCP/IP communications. Internet services - mail, remote access, www. Secure communication, tunneling. Directory services, certificates, certification authorities, public key infrastructure (PKI). Use in practice. Network security - firewalls (packet filters, proxies, gateways, NAT, DMZ), practical exercises. (According to the interest - the serial control lines, modems)			Z		2
04API	Presentation Course The course will prepare students for presenting issues in their field by mastering the strategies and techniques of oral presentation. The course includes discussions (expressing views, comments, agreement, disagreement). Students will be able to respond to comments on their presentation and answer questions addressed to them after the presentation, which is a skill required for the defence of the Bachelor Project. Students will learn the basic structure of a Bachelor Project and rules for writing a paper.			Z		2
01PW	Windows Programming Simple graphical programs for MS Windows. Basic editing controls. File input and output. User defined components, dynamic type identification and reflection.			Z		2
01BASE	Bachelor Seminar In the first part of the seminar, students familiarize themselves with the general principles of publishing and presenting scientific work and the formal requirements for bachelors degree projects at the faculty. The second part is designed as a practical training for the defense of the bachelors degree project. The students give oral presentations of the current state of the research results achieved during the work on their projects. Each presentation is followed by a discussion on scientific matters as well as on the possibilities of improving the students performance.			Z		1

01UOP	Introduction to Object Programming Object oriented programming languages. Object oriented programming libraries for graphics, databases and distributed systems.	ZK	2
01UP1	Introduction to Probability 1 1.Random trial with finite set of possible results, classical probability, independent random events 2.Probability and combinatorics 3.Probability and geometry, Bertrands paradox 4.Conditional probability, Bayes theorem, medical diagnosis, Simpsons paradox 5.Random variable with discrete state space, its distribution and mean value 6.Problems involving the calculation of mean value 7.Probabilistic method in graph theory 8.Random algorithms, Morris algorithm and its variants	Z,ZK	3
01UP2	Introduction to Probability 2 1. One-dimensional continuous random variable and its statistical description. 2. Distribution function and probability density. 3. Axiomatic introduction of probability and connection to measure theory. 4. Numerical characteristics of continuous random variables. 5. Selected variants of continuous distributions and their characteristics. 6. Elementary methods for point estimations. 7. Generating pseudorandom numbers from the selected distribution.	Z,ZK	3
01UTEI	Introduction to Theoretical Informatics	ZK	3
01ZAOS	Introduction to Operating Systems Introduction to structure of operating systems. Processes, thread, memory management. Synchronization of multi-threaded applications. Memory mapped files.	Z,ZK	2

Name of the block: Compulsory elective courses

Minimal number of credits of the block: 0

The role of the block: PV

Code of the group: BSSPOLVEDY

Name of the group: BS - Social Sciences

Requirement credits in the group:

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

Credits in the group: 0

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

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

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

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

Code of the group: BSPJAZYKYZK-APIN

Name of the group: BS P languages APIN

Requirement credits in the group:

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

Credits in the group: 0

Note on the group:

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
04XCESMZK	<b>Czech for Intermediate Students Examination</b> Jana Ková ová Jana Ková ová Jana Ková ová (Gar.)	ZK	4		Z	PV
04XCESPZK	<b>Czech for Foreign Students - Advanced Examination</b> Jana Ková ová Jana Ková ová Jana Ková ová (Gar.)	ZK	4		Z	PV
04XFMZK	<b>French for Intermediate Students Examination</b> V ra Šlechtová V ra Šlechtová V ra Šlechtová (Gar.)	ZK	4		Z	PV

04XFPZK	<b>French for Advanced Students Examination</b> <i>V ra Šlechtová V ra Šlechtová V ra Šlechtová (Gar.)</i>	ZK	4	Z	PV
04XFZZK	<b>French for Beginners Examination</b> <i>V ra Šlechtová V ra Šlechtová V ra Šlechtová (Gar.)</i>	ZK	3	L	PV
04XNMZK	<b>German for Intermediate Students Examination</b> <i>Miloslava echová Miloslava echová Miloslava echová (Gar.)</i>	ZK	4	Z	PV
04XNPZK	<b>German for Advanced Students Examination</b> <i>Miloslava echová Miloslava echová Miloslava echová (Gar.)</i>	ZK	4	Z	PV
04XRMZK	<b>Russian for Intermediate Students Examination</b> <i>Zhanna Isaeva Zhanna Isaeva Zhanna Isaeva (Gar.)</i>	ZK	4	Z	PV
04XRPZK	<b>Russian for Advanced Students Examination</b> <i>Zhanna Isaeva Zhanna Isaeva Zhanna Isaeva (Gar.)</i>	ZK	4	Z	PV
04XRZZK	<b>Russian for Beginners Examination</b> <i>Zhanna Isaeva Zhanna Isaeva Zhanna Isaeva (Gar.)</i>	ZK	3	L	PV
04XSMZK	<b>Spanish for Intermediate Students Examination</b> <i>Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)</i>	ZK	4	Z	PV
04XSPZK	<b>Spanish for Advanced Students Examination</b> <i>Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)</i>	ZK	4	Z	PV
04XSZZK	<b>Spanish for Beginners Examination</b> <i>Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)</i>	ZK	3	L	PV

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

04XCESMZK	Czech for Intermediate Students Examination	ZK	4		
The course content is the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of the CESM1,2,3 courses and can only be taken after successful completion of the 3 courses. Detailed information is to be obtained from the teacher.					
04XCESPZK	Czech for Foreign Students - Advanced Examination	ZK	4		
The course content is the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of the CESP1,2,3 courses and can only be taken after successful completion of the 3 courses. Detailed information is to be obtained from the teacher.					
04XFMZK	French for Intermediate Students Examination	ZK	4		
The content is the examination as given by the study programme. The whole French programme is ended with an examination covering the contents of FM1-FM3. The examination consists of a written and oral part and is organized according to Examination Instructions, a document available on the web.					
04XFPZK	French for Advanced Students Examination	ZK	4		
The whole French program is ended with an examination covering the contents of FP1-FP3. The examination consists of a written and/or an oral part and is organized according to Examination Instructions, a document available on the web. Assessment of the presentation is included into the examination grading.					
04XFZZK	French for Beginners Examination	ZK	3		
The content is the examination as given by the study plan. The course is terminated with an examination consisting of oral and written part. The examination is ruled by the document Instruction for examination. Its content covers the levels FZ1 - FZ5.					
04XNMZK	German for Intermediate Students Examination	ZK	4		
The course content is the examination as given by the study plan. The whole German for Intermediate Students Course is completed by an examination consisting of two parts - written and oral, which cover the courses NM1 - NM3. The oral part follows after passing the written part successfully and after obtaining the 04NM3 assessment. More detailed information is to be obtained from the teacher.					
04XNPZK	German for Advanced Students Examination	ZK	4		
The course content is the examination as given by the study plan. The whole German for Advanced Students Course is completed by an examination consisting of two parts - written and oral, which cover the courses NP1 - NP3. The oral part follows after passing the written part successfully and after obtaining the 04NP3 ungraded assessment. More detailed information is to be obtained from the teacher.					
04XRMZK	Russian for Intermediate Students Examination	ZK	4		
The course content is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowledge and skills acquired in RM1 - RM3. Students are eligible for the oral examination only after a prior pass in RM3 and a successful written examination. Students are given instructions by the teacher.					
04XRPZK	Russian for Advanced Students Examination	ZK	4		
The course content is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowledge and skills acquired in RP1 - RP3. Students are eligible for the oral examination only after a prior pass in RP3 and a successful written examination. Students are given instructions by the teacher.					
04XRZZK	Russian for Beginners Examination	ZK	3		
The course content is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowledge and skills acquired in RZ1 - RZ5. Students are eligible for the oral examination only after a prior pass in RZ5 and a successful written examination. Students are given instructions by the teacher.					
04XSMZK	Spanish for Intermediate Students Examination	ZK	4		
The course content is the examination as given by the study plan. SMZK examination consists of two parts - written and oral; to be eligible for the written part, students will have obtained non-graded assessment for course SM3. Oral examination follows the written part.					
04XSPZK	Spanish for Advanced Students Examination	ZK	4		
The course content is the examination as given by the study plan. Examination SPZK consists of two parts, namely oral and written. The prerequisite for admission to oral part is having passed the written test. Examination content is based on syllabi of courses SP1, SP2, and SP3 or on an individual study plan of the student.					
04XSZZK	Spanish for Beginners Examination	ZK	3		
The course content is the examination as given by the study plan. Examination consists of two parts - written and oral. Student can register for oral examination only if he/she has passed the written examination test.					

Name of the block: Elective courses

Minimal number of credits of the block: 0

The role of the block: V

Code of the group: BSPAPINV

Name of the group: BS P\_APIN Optional courses

Requirement credits in the group:

Requirement courses in the group:

Credits in the group: 0

Note on the group:

Státní jazykovou zkoušku z angličtiny lze absolvovat až po složení zkoušek ze všech kurzů, jejichž obsah je součástí.

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
04APSZK	<b>English - State Examination</b> Jana Ková ová	ZK	5	2S	L	v
01DEM	<b>History of Mathematics</b> Lubomíra Dvo áková Lubomíra Dvo áková Lubomíra Dvo áková (Gar.)	Z	1	0+2	L	v
18EKN	<b>Econometrics</b> Radek H ebík, Quang Van Tran Quang Van Tran Quang Van Tran (Gar.)	Z,ZK	4	2P+2C	L	v
01JEPR	<b>Simple Compilers</b> Zden k ulík Zden k ulík Zden k ulík (Gar.)	Z	2	2	L	v
18MAK1	<b>Macroeconomics 1</b> Quang Van Tran Quang Van Tran Quang Van Tran (Gar.)	Z,ZK	4	2+2	L	v
18MAK2	<b>Macroeconomics 2</b> Quang Van Tran Quang Van Tran Quang Van Tran (Gar.)	Z,ZK	4	2+2	Z	v
00MAM1	<b>Essentials of High School Course 1</b> David B e	Z	1	0+1		v
00MAM2	<b>Essentials of High School Math Course 2</b> Lukáš Heriban Severín Pošta Lukáš Heriban (Gar.)	Z	1	0+1		v
18MIK	<b>Microeconomics</b> Quang Van Tran Quang Van Tran Quang Van Tran (Gar.)	Z,ZK	4	2P+2C	Z	v
12NME1	<b>Numerical Methods 1</b> Pavel Váchal Pavel Váchal Pavel Váchal (Gar.)	Z,ZK	4	2+2	L	v
18PROP	<b>Practical training in programming</b> Jakub Klínek Jakub Klínek Jakub Klínek (Gar.)	KZ	3	2C	Z	v
01PERI	<b>Programming of Peripherals Devices</b> Zden k ulík Zden k ulík (Gar.)	Z	2	2+0	Z	v
18PMTL	<b>Programming in MATLAB</b> Quang Van Tran, Mat j Pokorný, Jaromír Kuka Quang Van Tran Jaromír Kuka (Gar.)	KZ	4	4C	Z	v
18PPY1	<b>Programming in Python 1</b> Jakub Klínek, Matej Mojzeš Jakub Klínek Jakub Klínek (Gar.)	Z	2	2C	L	v
18PPY2	<b>Programming in Python 2</b> Jakub Klínek Jakub Klínek Jakub Klínek (Gar.)	Z	2	2S	Z	v
18PPY3	<b>Programming in Python 3</b> Rudolf Pecinovský Jakub Klínek Jakub Klínek (Gar.)	Z	2	2C	L	v
18PW	<b>Web environment and markup languages</b> Pavel Eichler Dana Majerová Dana Majerová (Gar.)	KZ	2	2C	Z	v
01PSL	<b>LaTeX - Publication Instrument</b> Petr Ambrož Petr Ambrož Petr Ambrož (Gar.)	Z	2	0+2	L	v
01SOS1	<b>Software Seminar 1</b> Zden k ulík Zden k ulík Zden k ulík (Gar.)	Z	2	0+2	Z	v
01SOS2	<b>Software Seminar 2</b> Zden k ulík Zden k ulík Zden k ulík (Gar.)	Z	2	0+2	L	v
TV-1	<b>Physical Education</b>	Z	1		Z	v
TV-2	<b>Physical Education</b>	Z	1		L	v
TV-3	<b>Physical education</b>	Z	1	0+2	Z	v
TV-4	<b>Physical education</b>	Z	1	0+2	L	v
12ZEL1	<b>Basic Electronics 1</b> Jaroslav Pavel Jaroslav Pavel Jaroslav Pavel (Gar.)	Z,ZK	3	2+1	Z	v
12ZEL2	<b>Basic Electronics 2</b> Jaroslav Pavel Jaroslav Pavel Jaroslav Pavel (Gar.)	Z,ZK	3	2+1	L	v
01ZPB1	<b>Introduction to Computer Security 1</b> Petr Voká Petr Voká Petr Voká (Gar.)	Z	2	1+1		v

**Characteristics of the courses of this group of Study Plan: Code=BSPAPINV Name=BS P\_APIN Optional courses**

04APSZK	English - State Examination	ZK	5
The course content is the examination as given by the study plan. Student is eligible for the State language examination (level C1 or B2 of CEFR) only if he/she has passed all the respective courses and examinations (04AP3KK, 04APAK, 04API, and 04APRK). From its first semester, part of the APIN programme covers also examination subjects. As required, examination conditions comply with respective rules and regulations for state language examinations.			
01DEM	History of Mathematics	Z	1
The subject has the form of regular seminars where the members of the department of mathematics, but also invited speakers - specialists in the field - give their talks on various topics from the history of mathematics.			



18EKN	Econometrics	Z,ZK	4
Econometrics is based on economic theory and the relations between economic quantities are expressed by mathematical tools and observed data from economic reality. The course covers basic instruments of econometric analysis as the basic econometric model, the generalized model, the system of simultaneous equations and instruments for econometric model verification.			
01JEPR	Simple Compilers	Z	2
Lexical and syntax analysis, code generation, simple optimizations, development environments, reflection.			
18MAK1	Macroeconomics 1	Z,ZK	4
Macroeconomics I provides students with a fundamental theoretical basis for understanding how an economy works. It introduces main macroeconomic indicators, money market, macroeconomic equilibrium theory, fundamentals of open economy theory, inflation, unemployment, economic growth, economic fluctuations, basic macroeconomic models of IS-LM, AS-AD and their implications for economic policies. The learning outcomes of the course is to equip students with ability to analyze macroeconomic phenomena and their interconnections and subsequently to use 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 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 modeling.			
00MAM1	Essentials of High School Course 1	Z	1
Students are introduced to mathematical concepts and methods used in the introductory physics course.			
00MAM2	Essentials of High School Math Course 2	Z	1
Review of basics of high school mathematics.			
18MIK	Microeconomics	Z,ZK	4
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 these processes and makes more clear behaviour of the economic agents. Lectures and seminars are designed so that the explanation of microeconomic concepts does not require knowledge of calculus.			
12NME1	Numerical Methods 1	Z,ZK	4
There are explained the basic principles of numerical mathematics important for numerical solving of problems important for physics and technology. Methods for solution of tasks very important for physicists (ordinary differential equations, random numbers) are included in addition to the basic numerical methods. Integrated computational environment MATLAB is used as a principle programming language as a demonstration tool. The seminars are held in computer laboratory.			
18PROP	Practical training in programming	KZ	3
The goal of this course is to understand advanced topics related to programming, code design and software project development. Students will practice pragmatic techniques and principles on concrete real-world examples. Emphasis is put on the review of freely available software tools that can improve the programmers work efficiency and ensure high quality of the final source code.			
01PERI	Programming of Peripherals Devices	Z	2
Memory organization, input and output ports, computer bus. Software libraries for computer peripherals, 3D graphic libraries. Principles of peripherals device drivers.			
18PMTL	Programming in MATLAB	KZ	4
Introducing Matlab environment as efficient tool for computation in complex arrays and symbolic variables, namely for linear algebra, mathematic analysis, statistics, algorithmization and geometric representation of results.			
18PPY1	Programming in Python 1	Z	2
This course introduces students to advanced features of the Python language and common scientific packages. The course covers both object-oriented as well as functional programming paradigms. The following part of the course describes the use of Python in the fields of scientific and technical computing (NumPy and SciPy packages), data processing and visualization.			
18PPY2	Programming in Python 2	Z	2
This course introduces students to practical applications of the Python language in scientific as well as commercial fields. The course is a seminar where each presented topic is accompanied by a short demo of a real-world application in the specific field.			
18PPY3	Programming in Python 3	Z	2
This advanced course is intended for students who have basic experience with programming in Python and using its libraries. It introduces students to advanced concepts of the Python language and modules they are based on.			
18PW	Web environment and markup languages	KZ	2
The course introduces students to fundamental principles and best practices for web design with respect to technical functionality, informational value, readability and usability.			
01PSL	LaTeX - Publication Instrument	Z	2
The course is devoted to the basics and facilities of computer typography, particularly to the system LaTeX			
01SOS1	Software Seminar 1	Z	2
Java, Java Beans, Assembly language programming for microprocessors Intel 80x86			
01SOS2	Software Seminar 2	Z	2
Graphical libraries GTK+ and Qt. Development of graphical user interface using C and C++ programming languages. Portable applications for Unix like operating systems, especially for Linux systems. Portability to Microsoft Windows.			
TV-1	Physical Education	Z	1
TV-2	Physical Education	Z	1
TV-3	Physical education	Z	1
TV-4	Physical education	Z	1
12ZEL1	Basic Electronics 1	Z,ZK	3
The subject provides primary knowledge of circuit theory concerning principles of electronic circuits in both stationary and harmonic stable state. Circuit analysis methods for linear circuits include symbolic and complex method are explained. Proper circuit analysis is also lectured. The subject's final part deals with transient effects inside linear circuits.			
12ZEL2	Basic Electronics 2	Z,ZK	3
The subject follows up with the Basic Electronics 1. Semiconductor elements basic properties are explained. The course's final part deals with basic themes of logical circuits field.			
01ZPB1	Introduction to Computer Security 1	Z	2

Code of the group: BSPJAZYKYZAP

Name of the group: BS P jazyky zap

Requirement credits in the group:

Requirement courses in the group:

Credits in the group: 0

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
04XAM1	<b>English for Intermediate Students M1</b> <i>Jana Ková ová</i>	Z	2	0+2	Z	v
04XAM2	<b>English for Intermediate Students M2</b> <i>Jana Ková ová</i>	Z	2	0+2	L	v
04XAM3	<b>English for Intermediate Students M3</b> <i>Jana Ková ová</i>	Z	2	0+2	Z	v
04XAP1	<b>English for Advanced Students P1</b> <i>Jana Ková ová</i>	Z	2	0+2	Z	v
04XAP2	<b>English for Advanced Students P2</b> <i>Jana Ková ová</i>	Z	2	0+2	L	v
04XAP3	<b>English for Advanced Students P3</b> <i>Jana Ková ová</i>	Z	2	0+2	Z	v
04XCESZ1	<b>Czech for Foreigners - Beginners 1</b> <i>Jana Ková ová Jana Ková ová (Gar.)</i>	Z	2	0+2	Z	v
04XCESZ2	<b>Czech for Foreigners - Beginners 2</b> <i>Jana Ková ová Jana Ková ová (Gar.)</i>	Z	2	0+2	L	v
04XCESZ3	<b>Czech for Foreigners - Beginners 3</b> <i>Jana Ková ová Jana Ková ová (Gar.)</i>	Z	2	2S	Z	v
04XCESM1	<b>Czech for Foreigners - Intermediate 1</b> <i>Jana Ková ová Jana Ková ová (Gar.)</i>	Z	2	0+2	Z	v
04XCESM2	<b>Czech for Foreigners - Intermediate 2</b> <i>Jana Ková ová Jana Ková ová (Gar.)</i>	Z	2	0+2	L	v
04XCESM3	<b>Czech for Foreigners - Intermediate 3</b> <i>Jana Ková ová Jana Ková ová (Gar.)</i>	Z	2	0+2	Z	v
04XCESP1	<b>Czech for Foreign Students - Advanced 1</b> <i>Jana Ková ová Jana Ková ová (Gar.)</i>	Z	2	0+2	Z	v
04XCESP2	<b>Czech for Foreigners - Advanced 2</b> <i>Jana Ková ová Jana Ková ová (Gar.)</i>	Z	2	0+2	L	v
04XCESP3	<b>Czech for Foreigners - Advanced 3</b> <i>Jana Ková ová Jana Ková ová (Gar.)</i>	Z	2	0+2	Z	v
04XFM1	<b>French for Intermediate Students M1</b> <i>V ra Šlechtová V ra Šlechtová (Gar.)</i>	Z	2	0+2	Z	v
04XFM2	<b>French for Intermediate Students M2</b> <i>V ra Šlechtová V ra Šlechtová (Gar.)</i>	Z	2	0+2	L	v
04XFM3	<b>French for Intermediate Students M3</b> <i>V ra Šlechtová V ra Šlechtová (Gar.)</i>	Z	2	0+2	Z	v
04XFP1	<b>French for Advanced Students P1</b> <i>V ra Šlechtová V ra Šlechtová (Gar.)</i>	Z	2	0+2	Z	v
04XFP2	<b>French for Advanced Students P2</b> <i>V ra Šlechtová V ra Šlechtová (Gar.)</i>	Z	2	0+2	L	v
04XFP3	<b>French for Advanced Students P3</b> <i>V ra Šlechtová V ra Šlechtová (Gar.)</i>	Z	2	0+2	Z	v
04XFZ1	<b>French for Beginners Z1</b> <i>V ra Šlechtová V ra Šlechtová (Gar.)</i>	Z	2	0+4	L	v
04XFZ2	<b>French for Beginners Z2</b> <i>V ra Šlechtová V ra Šlechtová (Gar.)</i>	Z	2	0+4	Z	v
04XFZ3	<b>French for Beginners Z3</b> <i>V ra Šlechtová V ra Šlechtová (Gar.)</i>	Z	2	0+4	L	v
04XFZ4	<b>French for Beginners Z4</b> <i>V ra Šlechtová V ra Šlechtová (Gar.)</i>	Z	2	0+4	Z	v
04XFZ5	<b>French for Beginners Z5</b> <i>V ra Šlechtová V ra Šlechtová (Gar.)</i>	Z	2	0+4	L	v
04XNM2	<b>German for Intermediate Students M2</b> <i>Miloslava echová Miloslava echová (Gar.)</i>	Z	2	0+2	L	v
04XNM1	<b>German for Intermediate Students M1</b> <i>Miloslava echová Miloslava echová (Gar.)</i>	Z	2	0+2	Z	v
04XNM3	<b>German for Intermediate Students M3</b> <i>Miloslava echová Miloslava echová (Gar.)</i>	Z	2	0+2	Z	v
04XNP1	<b>German for Advanced Students P1</b> <i>Miloslava echová Miloslava echová (Gar.)</i>	Z	2	0+2	Z	v
04XNP2	<b>German for Advanced Students P2</b> <i>Miloslava echová Miloslava echová (Gar.)</i>	Z	2	0+2	L	v
04XNP3	<b>German for Advanced Students P3</b> <i>Miloslava echová Miloslava echová (Gar.)</i>	Z	2	0+2	Z	v
04XRM1	<b>Russian for Intermediate Students M1</b> <i>Zhanna Isaeva Zhanna Isaeva (Gar.)</i>	Z	2	0+2	Z	v
04XRM2	<b>Russian for Intermediate Students M2</b> <i>Zhanna Isaeva Zhanna Isaeva (Gar.)</i>	Z	2	0+2	L	v

04XRM3	<b>Russian for Intermediate Students M3</b> <i>Zhanna Isaeva Zhanna Isaeva (Gar.)</i>	Z	2	0+2	Z	v
04XRP1	<b>Russian for Advanced Students P1</b> <i>Zhanna Isaeva Zhanna Isaeva (Gar.)</i>	Z	2	0+2	Z	v
04XRP2	<b>Russian for Advanced Students P2</b> <i>Zhanna Isaeva Zhanna Isaeva (Gar.)</i>	Z	2	0+2	L	v
04XRP3	<b>Russian for Advanced Students P3</b> <i>Zhanna Isaeva Zhanna Isaeva (Gar.)</i>	Z	2	0+2	Z	v
04XRZ1	<b>Russian for Beginners Z1</b> <i>Zhanna Isaeva Zhanna Isaeva (Gar.)</i>	Z	2	0+4	L	v
04XRZ2	<b>Russian for Beginners Z2</b> <i>Zhanna Isaeva Zhanna Isaeva (Gar.)</i>	Z	2	0+4	Z	v
04XRZ3	<b>Russian for Beginners Z3</b> <i>Zhanna Isaeva Zhanna Isaeva (Gar.)</i>	Z	2	0+4	L	v
04XRZ4	<b>Russian for Beginners Z4</b> <i>Zhanna Isaeva Zhanna Isaeva (Gar.)</i>	Z	2	0+4	Z	v
04XRZ5	<b>Russian for Beginners Z5</b> <i>Zhanna Isaeva Zhanna Isaeva (Gar.)</i>	Z	2	0+4	L	v
04XSM1	<b>Spanish for Intermediate Students M1</b> <i>Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)</i>	Z	2	0+2	Z	v
04XSM2	<b>Spanish for Intermediate Students M3</b> <i>Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)</i>	Z	2	0+2	L	v
04XSM3	<b>Spanish for Intermediate Students M3</b> <i>Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)</i>	Z	2	0+2	Z	v
04XSP1	<b>Spanish for Advanced Students P1</b> <i>Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)</i>	Z	2	0+2	Z	v
04XSP2	<b>Spanish for Advanced Students P2</b> <i>Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)</i>	Z	2	0+2	L	v
04XSP3	<b>Spanish for Advanced Students P3</b> <i>Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)</i>	Z	2	0+2	Z	v
04XSZ1	<b>Spanish for Beginners Z1</b> <i>Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)</i>	Z	2	0+4	L	v
04XSZ2	<b>Spanish for Beginners Students Z2</b> <i>Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)</i>	Z	2	0+4	Z	v
04XSZ3	<b>Spanish for Beginners Z3</b> <i>Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)</i>	Z	2	0+4	L	v
04XSZ4	<b>Spanish for Beginners Z4</b> <i>Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)</i>	Z	2	0+4	Z	v
04XSZ5	<b>Spanish for Beginners Z5</b> <i>Beatriz Vadillo Gonzalo Beatriz Vadillo Gonzalo (Gar.)</i>	Z	2	0+4	L	v

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

04XAM1	English for Intermediate Students M1	Z	2
The course is designed for students who have successfully completed the full secondary school English language course at least at the A2 level of the Common European Framework of Reference for Languages (CEFR). It provides an introduction into English for Specific and Academic Purposes (ESP, EAP), i.e., into fundamentals of vocabulary and style typical of professional oral and written communication situations. Thus it covers topics related to the student's life and needs as well as topics of subtechnical interest. Attention is also paid to extending the knowledge of grammar issues used in EAP.			
04XAM2	English for Intermediate Students M2	Z	2
The AM2 course expects the student to have completed the AM1 course. It develops their skills for work with subtechnical texts, focusing also more on specific grammar, functions, and lexical items typical of ESP and EAP (e.g., definition, existence and classification of phenomena, object descriptions). Part of the course is also guided writing. If necessary, grammar revision is included.			
04XAM3	English for Intermediate Students M3	Z	2
The course develops the skills that enable students to cope with features typical of professional style. Increasing attention is paid to developing subtechnical vocabulary and independent understanding of professional texts. Great emphasis is placed on distinguishing different levels of formal and informal oral and written communication and their appropriate Czech equivalents. The course also includes studying abstracts and rules for writing them as well as basic rules for preparing and giving a short presentation on a chosen topic related to the student's field.			
04XAP1	English for Advanced Students P1	Z	2
The course is designed for students who have successfully completed the full secondary school English language course (at least the B1 level of the Common European Framework of Reference for Languages - CEFR). It provides an introduction into English for Specific and Academic Purposes (ESP, EAP), i.e., into the fundamentals of vocabulary, functions, grammar, and style typical of professional oral and written communication situations (fundamentals of terms in mathematics and physics, definitions, graph descriptions, etc). It also covers professional oral and written communication on topics related to the undergraduate's life and needs. It develops skills for free professional writing (writing a CV, letter of application, polite request). If necessary, revision of selected grammar topics is included.			
04XAP2	English for Advanced Students P2	Z	2
The AP2 course is based on AP1, thus extending the student's skills for working with subtechnical texts, and even with professional texts of chosen branches of science. According to the students' needs it concentrates on chosen grammar topics, but mainly intends to develop understanding of syntactic structures and typical rhetorical functions (e.g., various types of descriptions, and, if possible, a case study). Increasing emphasis is placed on the undergraduate's independent work with and reading of linguistically more demanding materials. The course extends the student's subtechnical vocabulary, and includes fundamental notions of chosen branches of science. It is focused on formal writing including the sentence and paragraph structure, linking, cohesion and coherence in texts.			
04XAP3	English for Advanced Students P3	Z	2
The AP3 course is based on AP2 and expects the student to work without any guidance with authentic professional materials and to interpret the 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; summarizing, writing an abstract) 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 informal language both in oral and written communication.			

04XCESZ1	Czech for Foreigners - Beginners 1	Z	2
The course is designed for students of the English programme. Students will become acquainted with the main characteristics of Czech (phonetic and grammar features) and they will acquire basic language and speaking skills. The course focuses on pronunciation exercises, simple social phrases, and oral and written communication in the most common everyday situations. The course covers roughly lessons 1-3 of eština Express (Czech Express) by L. Holá and P. Bo ilová.			
04XCESZ2	Czech for Foreigners - Beginners 2	Z	2
The language and communication competences acquired in CESZ1 are further developed. Students deepen their knowledge of the declension and conjugation system and practise basic communication topics. The course covers roughly lessons 3-5 in Czech Express by L. Holá and P. Bo ilová.			
04XCESZ3	Czech for Foreigners - Beginners 3	Z	2
The course further develops the language and communication competences acquired in the XCESZ1 and XCESZ2 courses. The teaching focuses on building up basic vocabulary, fixing correct pronunciation and deepening grammar, features through practice, as well as introducing the Czech culture. Students are asked to produce simple texts and they practise frequent types of dialogue. They also practise understanding texts in terms of main ideas or looking for specific details in texts. The course covers roughly lessons 5-7 in eština expres 1.			
04XCESM1	Czech for Foreigners - Intermediate 1	Z	2
The course is focused on correct pronunciation, important morphological phenomena, prepositional phrases, and verb forms as well as on extending the student's vocabulary for various social situations.			
04XCESM2	Czech for Foreigners - Intermediate 2	Z	2
The course develops the topics covered in CESM1 and is then focused on more difficult grammar phenomena. It practices writing, speaking, and reading skills and trains the student in understanding common abbreviations, abbreviated words, and mathematical terms and formulas.			
04XCESM3	Czech for Foreigners - Intermediate 3	Z	2
The last course revises morphological topics covered earlier and extends the student's knowledge of more difficult language phenomena. It is especially focused on stylistics and lexicology and on developing the student's writing skills.			
04XCESP1	Czech for Foreign Students - Advanced 1	Z	2
The prerequisite of the course is very good knowledge of the Czech language, i.e., communicative competences at least at level B2 of the Common European Framework of Reference. 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 includes communication with teachers and faculty administrators.			
04XCESP2	Czech for Foreigners - Advanced 2	Z	2
This course extends the student's knowledge acquired in CESP1 and focuses on difficult language phenomena. It practises working with technical and specialist texts placing greater emphasis on individual work.			
04XCESP3	Czech for Foreigners - Advanced 3	Z	2
The course develops the student's knowledge from CESP2. It includes working with authentic specialist materials, their interpretation and presentation, and, finally, presentation of the student's project. Writing skills necessary for professional communication are trained.			
04XFM1	French for Intermediate Students M1	Z	2
French - intermediate FM The objective of this three-semester course is to improve and further develop communication in the French language in both written and oral form. Students will be able to communicate in social interaction and in academic, scientific and professional environment. They will be able to use the language to transmit general and technical information and to solve problems. FM1 The course builds on and further develops linguistic competence acquired at secondary school. It revises, systemizes and expands language skills gained in previous study. The following topics are covered: University studies in our country and in France, writing of transactional letters, CV, personal statement, request, answer to an advert, French culture and geography, Paris. Topics of specialization: mathematics, physics. Reading technical and popular science texts, work based on these texts.			
04XFM2	French for Intermediate Students M2	Z	2
Course FM2 builds on FM1. Linguistic structures and competence acquired in previous study are systemized and expanded. Reading popular science texts, features typical for technical and scientific language (passives, nominalization, word formation). Topics: physics, power engineering, environment, Internet, success of French science and technology, French scientists, artists and architects. Description of an object, device, shapes, dimensions, material.			
04XFM3	French for Intermediate Students M3	Z	2
The course is focused on improvement and further development of linguistic competence acquired during the follow-up courses. Syntactic structures (subordinate and infinitive clauses, participle structures, compound tenses). Text summary. -Students prepare a written paper which will be delivered in form of an oral presentation in-class. The paper is linked to the field of students' future specialisation or to their interest and generally covers a technical /applied science topic. It is not a translation but a creative work compiled from French articles and one's own knowledge/experience. -Longer monologues on topics /situations set for the examination are prepared. Text structure, cohesion and coherence.			
04XFP1	French for Advanced Students P1	Z	2
FP advanced course The objective of this three-semester course is to improve and further develop communication in the French language in both written and oral form. Students will be able to communicate in social interaction and in academic, scientific and work environment. They will be able to use the language to transmit general and technical information and to solve problems. FP1 The course builds on and further develops linguistic competence acquired at secondary school. Difficult grammar topics are repeated and expanded: subjunctif, passé composé-imparfait, pronouns. The following specific topics are covered: University studies in our country and in France, writing of transactional letters, CV, personal statement, request, answer to an advert, environmental issues, success of French science and technology, chosen topics from French regional culture, Paris. Topics of specialization: mathematics, internet, physics, chemistry. Reading of technical and popular science texts, further work with these texts and interpretation.			
04XFP2	French for Advanced Students P2	Z	2
With the link to P1 contents, the course further develops language skills. Focus is put on reading popular science texts and on oral communication on given topics. Features typical of technical and scientific communication are stressed (passive voice, nominalization, word formation).			
04XFP3	French for Advanced Students P3	Z	2
The course is focused on systemization and improvement of acquired linguistic competence, skills and knowledge, and their use for communication in engineering environment. Special skill - translation of shorter texts (both from and into the language). Writing of a paper and making oral presentation in-class. The paper generally covers a technical /applied science topic. It is a creative work compiled from 3 French sources. Preparation of several set topics for oral examination.			
04XFZ1	French for Beginners Z1	Z	2
French for beginners The objective of this 5-level course is to be able to communicate in French orally and in writing in situations of everyday life , in socializing and in professional life. The course includes French for specific / technical communication and reading of popular science and scientific texts. FZ1 The objective is to be able to communicate at elementary level, actively using the knowledge of chosen elementary language. The contents is roughly outlined by lessons 1 - 7 of the textbook Pravda - Pravdová, French for beginners (Francouzština pro začáteky). It is extended with situations of communication and functions from the textbook Espaces I, lessons 1-4 : introductions, personal information, asking and giving the directions, simple instructions and questions. Special attention is paid to pronunciation. Spelling is explained in connection with pronunciation and grammar.			
04XFZ2	French for Beginners Z2	Z	2
The course is linking up with FZ1. Elementary linguistic knowledge and communication skills are expanded. The scope is given by lessons 8 - 13 of the textbook: Pravda - Pravdová : French for Beginners . Additional topics and skills are filled in from the textbook Espaces I, lesson 1 - 5 (introductions, invitation, welcoming, agreement - disagreement, apology, thanking, travelling, map of France, food, expression of will, wish, order, prohibition, pleasure). Correct pronunciation is practiced. Stress on oral communication. Specific topics covered: How does the machine work? A few expressions concerning the study. Name of University and Faculty.			

04XFZ3	French for Beginners Z3	Z	2
The course builds upon FZ2. Basic linguistic knowledge and skills are developed. The contents is given by lessons 14 - 18 of the textbook: Pravda - Pravdová: French for Beginners. Topics, functions and situations are complemented from other materials. Stress is put on oral communication in dialogues and on reading, both for information and loud as part of pronunciation practice. Reading covers short adapted texts of general interest first, and later popular science texts.			
04XFZ4	French for Beginners Z4	Z	2
The course builds up on FZ3. Basic linguistic knowledge and skills are further developed. Oral communication and reading skills are practiced. The contents is roughly covered with lessons 19 - 23 of the textbook French for Beginners, and is expanded with topics and functions from other materials. Reading is developed from the lecture notes French for Engineering Students of FJFI. The course covers general and specific topics: health- illness, sport, free time, environment, study, travelling in France, Paris, shopping, weather, university in our country and in France, how to write CV, application, topics in mathematics, reading physics - mechanics, informatics, internet.			
04XFZ5	French for Beginners Z5	Z	2
All four skills acquired in FZ4 are further developed, as well as technical language. Students prepare a paper on a chosen popular science topic. They present it orally in the class. The general contents is covered by lessons 24 - 26 of the textbook: Pravda-Pravdova, French for Beginners, and is complemented from other materials. Topics: on physics from lecture notes, success of French science and technology, information about France. Grammar is systemized and complemented with syntax (subordinate clauses, typical conjunctions, subjunctive clauses, gerund, passive).			
04XNM2	German for Intermediate Students M2	Z	2
The course introduces other more complex grammatical structures and their application in communication based on technical texts, such as the relation 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).			
04XNM1	German for Intermediate Students M1	Z	2
The objective of the course is to level off the students' skills in the German language. The course focuses on revision of more difficult phenomena and structures (e.g. the passive) and word formation processes (e.g. importance of verb prefixes). In the lexical part, it covers topics referring to higher education in both the Czech Republic and Germany, current environmental issues together with all necessary expressions and phrases, expressions and phrases needed to chemists, mathematicians, physicists, and the fundamentals of IT terminology. It develops communication on related topics and is aimed at correct pronunciation, grammatical correctness and understandability.			
04XNM3	German for Intermediate Students M3	Z	2
The course introduces other more complex grammatical structures and their application in communication based on technical texts, such as the 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).			
04XNP1	German for Advanced Students P1	Z	2
This course requires good grammar knowledge, extended general vocabulary, and good communication skills acquired at secondary school to be 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.			
04XNP2	German for Advanced Students P2	Z	2
The course develops the students' skills in working with professional scientific texts (understanding, summarising, note-taking, interpreting) while 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 oral (CV, letter of application, interview, scholarship), and more complex grammatical structures (i.e., subjunctive, indirect speech).			
04XNP3	German for Advanced Students P3	Z	2
The course consists of 3 main parts (general communicative situations, grammar and technical topics). Students will develop their vocabulary in a variety of less common situations (traffic problems and car accidents, accident report, filling in a form, complaints). Based on presentations and technical and subtechnical texts, the vocabulary range in fields such as nuclear power engineering, the environment, computer science, and car technology, will also be extended. Only authentic professional texts are used. By means of a presentation, students are trained to process information gained from their reading of complex and difficult texts and present it to the class in a simplified oral form. The course also includes translation practice to and from German.			
04XRM1	Russian for Intermediate Students M1	Z	2
The course is designed for students with previous knowledge of Russian from secondary schools. Students are supposed to know the Russian alphabet (both printed and handwritten), basic vocabulary for communication in everyday situations (introductions, socializing, greetings, shopping for food and objects of everyday need, asking the way and giving directions), they can use basic grammar structures (verbal and nominal forms, irregular verbs, pronouns). The initial knowledge corresponds to the achievement level of the RZ2 course. The contents and scope of the course correspond approximately to the RZ3 course, but for half of the time allotted in the timetable.			
04XRM2	Russian for Intermediate Students M2	Z	2
The course is based on the RM1 course, its contents and scope correspond roughly to RZ4, however, for half of the time allotted in the timetable.			
04XRM3	Russian for Intermediate Students M3	Z	2
The course develops the knowledge and skills acquired in RM1 and RM2 and its contents and scope are roughly at the same level as those of RZ5, however, for half of the time allotted in the timetable.			
04XRP1	Russian for Advanced Students P1	Z	2
The entrance requirement for the course is to achieve the B1 CEFR level. The objective of the course is revision of standard language structures, practicing more difficult grammar structures, understanding the fundamentals of technical language and training writing skills.			
04XRP2	Russian for Advanced Students P2	Z	2
The course is based on RP1. It expands grammatical structures important for understanding technical texts (verbal adjectives, participles, passives, verb aspects, specific syntactic structures). Stress is put on independent oral and written communication.			
04XRP3	Russian for Advanced Students P3	Z	2
The course is based on RP2 and is mainly focused on working with technical and scientific texts (reading comprehension, oral and written paraphrasing, translation). The RP1 - RP3 courses require good previous knowledge of general language at secondary level (listening, reading, correct communication in everyday situations). The courses develop and expand these skills. Further study is aimed at professional and technical skills (reading technical literature according to the students' specialization, oral and written interpretation). Students develop their subtechnical vocabulary and practice quick and correct communication in professional situations. They will be able to both speak write accurately and with confidence on technical topics.			
04XRZ1	Russian for Beginners Z1	Z	2
The course represents the first stage of the five-semester programme, its final aim being reading and understanding professional texts written in Russian. Thus it begins with mastering the Russian alphabet (for both reading and writing skills) and fundamentals of grammar necessary for everyday communication (listening and speaking). Students will be able to read a short text with marked stress, understand its contents and summarize it.			

04XRZ2	Russian for Beginners Z2	Z	2
The second semester of the programme is designed to teach skills for basic communication in everyday situations and for reading easy and short subtechnical texts. Students will be able to communicate using short sentences and appropriate structures, and read aloud with confidence a short text without marked stress. They will also develop their vocabulary and master further grammatical structures. They will have mastered with confidence the Russian alphabet and will be able to use it in writing.			
04XRZ3	Russian for Beginners Z3	Z	2
The course is based on RZ2 and includes further everyday topics, develops understanding of short compact texts on new subtechnical topics (for training various forms of reading skills and listening) and introduces new grammar. Students will be trained to distinguish intonation patterns while listening to spoken language. They will be able to respond so as to be understood, and to express their opinion. Writing skills will be trained on guided writing tasks and note-taking.			
04XRZ4	Russian for Beginners Z4	Z	2
The course is based on RZ3. It improves and expands the knowledge of general language in all four skills (reading and understanding longer texts with a certain percentage of unfamiliar words, oral communication in everyday situations, writing longer texts). Students are trained to use grammar structures effectively (e.g., irregular verbs, differences in verb patterns from Czech, modality, imperatives, conditionals). They practice and develop communication skills for everyday situations (food, travelling, free time), and practice oral and written communication on more specific topics (environment, addictions, the green movement). They become acquainted with various geographical data (e.g., Siberia), learn how to fill in forms, look up the information from the timetable, learn about Russian holidays and typical meals.			
04XRZ5	Russian for Beginners Z5	Z	2
The course expects the student to have completed RZ4. It concentrates predominantly on reading skills (working with professional texts, i.e. understanding, extracting and summarizing information from a specialized text) and speaking, and to a certain extent, writing about the professional information obtained by reading the texts. Communication skills are trained on everyday topics. Studying grammar is based on professional and technical texts and only includes items typically used in professional communication (verbal adjectives, participles, passive voice). Students develop their technical and economic vocabulary, and are also trained in some professional skills (writing a CV, polite request, etc.)			
04XSM1	Spanish for Intermediate Students M1	Z	2
The course is designed for students whose competence is at level B1 of CEFR, i.e. those who studied Spanish in the secondary school. The 3-semester course develops standard vocabulary and pays attention to further grammar topics (e.g., perífrasis verbales, futuro imperfecto, direct object and indirect object pronouns, negative form of the imperative, and subjunctive), to written and oral communication on a given everyday or easy subtechnical topic, for which the students are trained by reading texts or listening to them.			
04XSM2	Spanish for Intermediate Students M3	Z	2
The course develops the students' knowledge from the previous course (SM1). Students are gradually acquainted with fundamentals of Spanish for specific purposes in order to be able to work with specialized texts on the Internet.			
04XSM3	Spanish for Intermediate Students M3	Z	2
The course books are supplemented with additional subtechnical materials, so the students will be gradually acquainted with the peculiarities of academic style. They will be competent enough to use the Internet in Spanish and search for information of their specialization or field of interest. Students will use the information to write short articles and summaries. The final part of the programme, general Spanish course based on course books, covers presentations and, finally, a written and oral examination.			
04XSP1	Spanish for Advanced Students P1	Z	2
Course concentrates on more difficult grammar topics, revision of vocabulary, basics of Spanish for specific purposes as well as written communication. Course prerequisites: level B2 of CEFR.			
04XSP2	Spanish for Advanced Students P2	Z	2
Course SP2 is the second part of the advanced Spanish course, extending Spanish for specific purposes topics. It comprises more grammar and syntax and focuses on independent written communication.			
04XSP3	Spanish for Advanced Students P3	Z	2
Course SP3 is the final part of the advanced Spanish course. It is based on texts chosen by the students according to their future specialization. It is focused on written communication based on what students will need in their career.			
04XSZ1	Spanish for Beginners Z1	Z	2
Course SZ1 is the first stage of the five-semester programme of Spanish studies; during the first stage the students will master phonetics and fundamental grammar structures and will be able to communicate at an elementary level on topics of everyday life. They will acquire and extend fundamental vocabulary of general Spanish and will develop it.			
04XSZ2	Spanish for Beginners Students Z2	Z	2
Course SZ2 is based on course SZ1, and expects students to develop and extend the knowledge and skills acquired so far. Grammar structures and lexis will be chosen so as to enable them to understand short adapted written texts and speech. Attention is also paid to cultural differences between Spanish-speaking countries and others such as the Czech Republic. Realia of Spanish-speaking countries are also included.			
04XSZ3	Spanish for Beginners Z3	Z	2
The course is based on course SZ2, and develops the student's vocabulary and grammar structure. The course covers realia (history and culture) of the Spanish-speaking countries, mainly of Spain. It pays attention to further grammar topics (pretérito perfecto, pretérito indefinido, pretérito imperfecto, the gerund and the imperative). It includes written and oral communication on a given general topic, for which the student is trained by reading texts or listening to them.			
04XSZ4	Spanish for Beginners Z4	Z	2
The course is based on course SZ3. It develops the student's vocabulary and extends the knowledge of the culture and social customs of the Spanish speaking countries, mainly of Spain. It pays attention to further grammar topics (perífrasis verbales, futuro imperfecto, direct object and indirect object pronouns, negative form of the imperative, and subjunctive), to written and oral communication on a given general or subtechnical topic, for which the student is trained by reading texts or listening to them.			
04XSZ5	Spanish for Beginners Z5	Z	2
The course books are supplemented with additional subtechnical materials, so the students will be gradually acquainted with peculiarities of Spanish for specific purposes. In its final part, the general Spanish course based on the course book will end with presentations and, finally, a written and oral examination.			

### List of courses of this pass:

Code	Name of the course	Completion	Credits
00EKOT	Economy in Technology The course introduces the basics of micro- and macroeconomics.	Z	1
00ETV	Ethics of Science and Technology	Z	1
00MAM1	Essentials of High School Course 1 Students are introduced to mathematical concepts and methods used in the introductory physics course.	Z	1

00MAM2	Essentials of High School Math Course 2 Review of basics of high school mathematics.	Z	1
00PT	Preparatory Week	Z	2
00RET	Rhetoric The course is focused on the acquisition of speech and voice techniques and on the rules of correct pronunciation. The course is also devoted to the composition of public speech as well as to its nonverbal aspects. Stylistics exercises, strategies for coping with stage-fright and a short excursion into the history of rhetoric are an integral part of the course.	Z	1
00UPRA	Introduction to Law	Z	1
00UPSY	Introduction to Psychology	Z	1
01BASE	Bachelor Seminar In the first part of the seminar, students familiarize themselves with the general principles of publishing and presenting scientific work and the formal requirements for bachelors degree projects at the faculty. The second part is designed as a practical training for the defense of the bachelors degree project. The students give oral presentations of the current state of the research results achieved during the work on their projects. Each presentation is followed by a discussion on scientific matters as well as on the possibilities of improving the students performance.	Z	1
01BPAI1	Bachelor's Degree Project 1 Bachelor's Degree project on the selected topic under the supervision. Supervision and regular checking of the bachelor project under preparation.	Z	5
01BPAI2	Bachelor's Degree Project 2 Bachelor's Degree project on the selected topic under the supervision. Supervision and regular checking of the bachelor project under preparation.	Z	10
01DEM	History of Mathematics The subject has the form of regular seminars where the members of the department of mathematics, but also invited speakers - specialists in the field - give their talks on various topics from the history of mathematics.	Z	1
01DIM1	Discrete Mathematics 1 The seminar is devoted to elementary number theory and applications. It includes individual problem solving.	Z	2
01DIM2	Discrete Mathematics 2 The seminar is devoted to recurrence relations. It includes individual problem solving.	Z	2
01EIG	Elementary Introduction to Graph Theory The course provides an explanation of basics of graph theory, followed by a survey of common graph algorithms.	ZK	3
01JEPR	Simple Compilers Lexical and syntax analysis, code generation, simple optimizations, development environments, reflection.	Z	2
01MAT1	Mathematics 1 The course is devoted to the study of the basics of calculus of one variable. It includes an introduction to differential and integral calculus, with particular emphasis on applications in practical problems.	Z	4
01MAT2	Mathematics 2 The course, which is the continuation of Mathematics 1, is devoted to the integration techniques, improper Riemann integral, introduction to parametric curves (especially in polar coordinates), the basics of sequences and infinite series, and finally to the Taylor and power series and their applications.	Z	4
01MAT3	Mathematics 3 The subject summarises the most important notions and theorems related to the study of finite-dimensional vector spaces.	Z,ZK	4
01MAT4	Mathematics 4 Linear and non-linear differential equations of the first order. Linear differential equations of higher order with constant coefficients. Multivariable calculus and its applications.	Z,ZK	4
01MATZ1	Mathematics, Examination 1	ZK	2
01MATZ2	Mathematics, Examination 2	ZK	2
01PERI	Programming of Peripherals Devices Memory organization, input and output ports, computer bus. Software libraries for computer peripherals, 3D graphic libraries. Principles of peripherals device drivers.	Z	2
01PGR1	Computer Graphics 1 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 state of the art technologies. Further, a survey of fundamental problems in 2D computer graphics is given together with their solutions. Focus is put on mathematical description of problems and explanation of the corresponding algorithms using knowledge previously obtained in a variety of subjects available at FNSPE. The final part of the course covers the applications of computer graphics approaches in the process of authoring scientific documents and presentations.	Z,ZK	2
01PGR2	Computer Graphics 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 phenomenon ubiquitous in computer graphics. Further, a well structured survey of fundamental problems in 3D computer graphics is given together with their solutions, from the description of a 3D scene to its realistic rendering. Focus is put on mathematical description of problems and explanation of the corresponding algorithms using knowledge previously obtained in a variety of subjects available 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 theoretical concepts are demonstrated using Blender, an open-source 3D modeling and rendering software instrument.	Z,ZK	2
01PSL	LaTeX - Publication Instrument The course is devoted to the basics and facilities of computer typography, particularly to the system LaTeX	Z	2
01PW	Windows Programming Simple graphical programs for MS Windows. Basic editing controls. File input and output. User defined components, dynamic type identification and reflection.	Z	2
01SITE1	Computer Networks 1 Understanding the history and present network (LAN, WAN, use the principles and technologies). Architecture of reference model ISO/OSI. Network protocols, practical exercises with TCP/IP communications. Internet services - mail, remote access, www. Secure communication, tunneling. Directory services, certificates, certification authorities, public key infrastructure (PKI). Use in practice. Network security - firewalls (packet filters, proxies, gateways, NAT, DMZ), practical exercises. (According to the interest - the serial control lines, modems)	Z	2
01SITE2	Computer Networks 2 Understanding the history and present network (LAN, WAN, use the principles and technologies). Architecture of reference model ISO/OSI. Network protocols, practical exercises with TCP/IP communications. Internet services - mail, remote access, www. Secure communication, tunneling. Directory services, certificates, certification authorities, public key infrastructure (PKI). Use in practice. Network security - firewalls (packet filters, proxies, gateways, NAT, DMZ), practical exercises. (According to the interest - the serial control lines, modems)	Z	2
01SOS1	Software Seminar 1 Java, Java Beans, Assembly language programming for microprocessors Intel 80x86	Z	2
01SOS2	Software Seminar 2 Graphical libraries GTK+ and Qt. Development of graphical user interface using C and C++ programming languages. Portable applications for Unix like operating systems, especially for Linux systems. Portability to Microsoft Windows.	Z	2

01UOP	Introduction to Object Programming Object oriented programming languages. Object oriented programming libraries for graphics, databases and distributed systems.	ZK	2
01UP1	Introduction to Probability 1 1.Random trial with finite set of possible results, classical probability, independent random events 2.Probability and combinatorics 3.Probability and geometry, Bertrands paradox 4.Conditional probability, Bayes theorem, medical diagnosis, Simpsons paradox 5.Random variable with discrete state space, its distribution and mean value 6.Problems involving the calculation of mean value 7.Probabilistic method in graph theory 8.Random algorithms, Morris algorithm and its variants	Z,ZK	3
01UP2	Introduction to Probability 2 1. One-dimensional continuous random variable and its statistical description. 2. Distribution function and probability density. 3. Axiomatic introduction of probability and connection to measure theory. 4. Numerical characteristics of continuous random variables. 5. Selected variants of continuous distributions and their characteristics. 6. Elementary methods for point estimations. 7. Generating pseudorandom numbers from the selected distribution.	Z,ZK	3
01UTEI	Introduction to Theoretical Informatics	ZK	3
01ZAOS	Introduction to Operating Systems Introduction to structure of operating systems. Processes, thread, memory management. Synchronization of multi-threaded applications. Memory mapped files.	Z,ZK	2
01ZPB1	Introduction to Computer Security 1	Z	2
02DEF1	History of Physics 1 Physics and its place in the system of sciences. The relationship of man and nature. Natural sciences in ancient Orientand Greece, Greek natural philosophers, Aristotle. Physics in Helenistic period, Archimed. Arabic science, European science in Middle Ages. Renaissance - da Vinci, Giordano Bruno. Copernicus, Kepler, Galileo, Huygens. The birth of physics as experimental science. Newton and his work.	Z	2
02FY1	Physics 1 History, principles and applications of mechanics, waves and thermodynamics ? basic level. The lecture is supplemented with practical investigation and demonstration of selected physical phenomena.	Z,ZK	4
02FY2	Physics 2 Thermodynamics, electricity and magnetism, modern physics. The lecture is supplemented with practical investigation and demonstration of selected physical phenomena.	Z,ZK	4
04AP3KK	Course in Communication Skills - Final Examination The course content is the examination as given by the study plan. Final examination 04AP3KK covers syllabi of all three courses in communication skills. It is usually oral, but a written test may be administered. Examination requirements are similar to those of state examination. Student will be able to engage in communication and discussion on a given topic, using appropriate vocabulary and grammar structures.	ZK	2
04APA	Course in Applied English Usage To sign in for the course, student will have passed final examination in Course in Language Structures (04APSK). The course concludes study of grammar structures and applies them to understanding everyday and ESP language situations, laying stress on choice of exact and adequate language and grammar structures in both English-Czech and Czech-English translations..	Z	1
04APAK	Course in Applied English Usage - Examination The course content is the examination as given by the study plan. Written and oral parts of the examination test skills and knowledge acquired in course 04APA. Duration: written part - 100 minutes, oral part - ca 30 minutes.	ZK	2
04API	Presentation Course The course will prepare students for presenting issues in their field by mastering the strategies and techniques of oral presentation. The course includes discussions (expressing views, comments, agreement, disagreement). Students will be able to respond to comments on their presentation and answer questions addressed to them after the presentation, which is a skill required for the defence of the Bachelor Project. Students will learn the basic structure of a Bachelor Project and rules for writing a paper.	Z	2
04APJP	Language Support to Bachelor Project To sign in for the course students will have passed all the English courses from the previous 5 semesters. The course instructs students in the strategy of writing, submitting, presenting, and defending the Bachelor Project in English. Their progress is continuously monitored and assessed. To finish the course, students will give a presentation of their Bachelor Project.	Z	5
04APK1	Course in Communication Skills 1 The course will develop communication strategy and skills of student acquired at secondary school or elsewhere. Competence at B1 level of CEFR is a prerequisite for registering for the course. It runs for 3 semesters, being a core course of the Applied Information Technology programme. It will develop student's communication skills in an integral form (e.g., listening and discussion on a topic). The list of topics is similar to that of the State Language Examination. Student will develop their vocabulary for various communication situations and will master their communication strategy. He/she will be trained to express his/her ideas clearly and according to current English usage.	Z	2
04APK2	Course in Communication Skills 2 The course is also concerned with developing speaking skills in English acquired at secondary school and course 04APK1. Speaking skills will be trained alongside listening skills. Topics will concentrate on everyday life and cover topics of the State Language Examination, stressing mastery of speaking strategy in various situations. The course will emphasise developing student's vocabulary, ability to express thoughts with accuracy in correct English.	Z	2
04APK3	Course in Communication Skills 3 The last semester of conversation course. Student will further develop his/her speaking skills to be able to use English competently, speak about topics covered by previous courses without making mistakes and making use of appropriate vocabulary.	Z	1
04APKK	Course in Communication Skills - Examination The course content is the examination as given by the study plan. The examination tests how well student has mastered vocabulary and facts of courses 04APK1 and 04APK2. The examination consists of two parts - written (duration 100 minutes), and oral (about 30 minutes).	ZK	1
04APO1	Text Analysis and Comprehension The course is a sequel to the 04APU1 and 04APU2 courses and students will have successfully passed the 04APS2 course. It focuses on further written functions specific to English for Specific Purposes (ESP). Increasing attention is given to extending subtechnical vocabulary, text grammar and text comprehension. Students are taught how to use formal language in written and oral communication.	Z	2
04APO2	Text Analysis and Comprehension 2 The course is a sequel to course 04APO1 and focuses on guided writing (e.g., note-taking, précis, abstract). It is intended as preparation for writing the bachelor's project by developing text grammar practice and acquainting with basics of English punctuation.	Z	1
04APOK	Text Analysis and Comprehension - Examination The course content is the examination as given by the study plan. To be eligible to take the examination students will have successfully completed the 04APO1 and 04APO2.courses The examination consists of two parts: written (duration 100 minutes) and oral (about 30 minutes). Students will prove they can use and apply the knowledge and skills acquired in both courses.	ZK	1
04APR1	Life and Institutions of English-speaking Countries and the CR 1 The course is aimed at preparing the student for the state language examination and is based on topics required for this examination. Great emphasis is placed on training oral presentation of facts about English speaking-countries in comparison with the Czech Republic. The course covers one third of topics for the state language examination.	Z	2



04APR2	Life and Institutions of English-speaking Countries and the CR 2	Z	2
The course following the 04APR1 course is again aimed at preparing the student for the state language examination and is based on topics required for this examination. Great emphasis is placed on training oral presentation of facts about English speaking-countries in comparison with the Czech Republic. The course covers two remaining thirds of topics for the state language examination.			
04APRK	Life and Institutions of English-speaking Countries and the CR - Examination	ZK	3
The course content is the examination as given by the study plan. To be eligible to take the examination students will have successfully completed the 04APR1 and 04APR2.courses The examination consists of two parts: written (duration 100 minutes) and oral (about 30 minutes). Students will prove they can use and apply the knowledge and skills acquired in both courses.			
04APS1	Course in Language Structures 1	KZ	3
The course is designed to instruct how to correctly use and to revise English grammar structures acquired by student at secondary school, develop them, view them as a system of communication and strengthen them. The required level for registration is B1 of CEFR. The course stresses mainly frequency of structures and those difficult to master by Czech students.			
04APS2	Course in Language Structures 2	KZ	3
The course 04APS2 is a sequel to course 04APS1. Its purpose is also to correctly use and revise further English grammar structures as acquired and develop them.			
04APS3	Course in Language Structures 3	Z	1
The course 04APS3 is a sequel to course 04APS2. Its purpose is also to correctly use and revise further English grammar structures as acquired by student, to develop them and use in practice.			
04APSK	Course in Language Structures - Final Examination	ZK	2
The course content is the examination as given by the study plan. To register for final examination 04APSK student will have passed a 3-semester programme comprising courses 04APS1, 04APS2, and 04APS3. It consists of two parts: written (duration 100 minutes) and oral (duration about 30 minutes). Student will demonstrate he/she has mastered English grammar and can reliably use it in practice as well as explain why a rule applies.			
04APSZK	English - State Examination	ZK	5
The course content is the examination as given by the study plan. Student is eligible for the State language examination (level C1 or B2 of CEFR) only if he/she has passed all the respective courses and examinations (04AP3KK, 04APAK, 04API, and 04APRK). From its first semester, part of the APIN programme covers also examination subjects. As required, examination conditions comply with respective rules and regulations for state language examinations.			
04APU1	Introduction to English for Specific Purposes 1	Z	2
The course will introduce student into English for Specific Purposes (ESP) and acquaint him/her with its functions in subtechnical or easy technical texts. It brings vocabulary and functions typical of ESP and it introduces student to basic mathematics and information technology terms.			
04APU2	Introduction to English for Specific Purposes 2	Z	2
The course 04APU2 is a sequel to course 04APU1, concentrating more thoroughly on ESP text content, text grammar and vocabulary. It introduces more advanced functions typical of ESP and more advanced information technology terms.			
04APUK	Introduction to English for Specific Purposes - Examination	ZK	1
The course content is the examination as given by the study plan. Examination 04APUK consists of two parts - written part (duration 100 minutes) and oral part (duration about 30 minutes) and covers a 2-semester programme. To be eligible for examination, student will have passed courses 04APU1 and 04APU2 and the examination test in written part. Student has to prove he/she can use the acquired basic knowledge and skills typical of English for Specific Purposes (ESP).			
04JPBP	Language Support to Bachelor Project	Z	3
To sign in for the course students will have passed all the English courses from the previous 5 semesters. The course instructs students in the strategy of writing, submitting, presenting, and defending the Bachelor Project in English. Their progress is continuously monitored and assessed. To finish the course, students will give a presentation of their Bachelor Project.			
04XAM1	English for Intermediate Students M1	Z	2
The course is designed for students who have successfully completed the full secondary school English language course at least at the A2 level of the Common European Framework of Reference for Languages (CEFR). It provides an introduction into English for Specific and Academic Purposes (ESP, EAP), i.e., into fundamentals of vocabulary and style typical of professional oral and written communication situations. Thus it covers topics related to the student's life and needs as well as topics of subtechnical interest. Attention is also paid to extending the knowledge of grammar issues used in EAP.			
04XAM2	English for Intermediate Students M2	Z	2
The AM2 course expects the student to have completed the AM1 course. It develops their skills for work with subtechnical texts, focusing also more on specific grammar, functions, and lexical items typical of ESP and EAP (e.g., definition, existence and classification of phenomena, object descriptions). Part of the course is also guided writing. If necessary, grammar revision is included.			
04XAM3	English for Intermediate Students M3	Z	2
The course develops the skills that enable students to cope with features typical of professional style. Increasing attention is paid to developing subtechnical vocabulary and independent understanding of professional texts. Great emphasis is placed on distinguishing different levels of formal and informal oral and written communication and their appropriate Czech equivalents. The course also includes studying abstracts and rules for writing them as well as basic rules for preparing and giving a short presentation on a chosen topic related to the student's field.			
04XAP1	English for Advanced Students P1	Z	2
The course is designed for students who have successfully completed the full secondary school English language course (at least the B1 level of the Common European Framework of Reference for Languages - CEFR). It provides an introduction into English for Specific and Academic Purposes (ESP, EAP), i.e., into the fundamentals of vocabulary, functions, grammar, and style typical of professional oral and written communication situations (fundamentals of terms in mathematics and physics, definitions, graph descriptions, etc). It also covers professional oral and written communication on topics related to the undergraduate's life and needs. It develops skills for free professional writing (writing a CV, letter of application, polite request). If necessary, revision of selected grammar topics is included.			
04XAP2	English for Advanced Students P2	Z	2
The AP2 course is based on AP1, thus extending the student's skills for working with subtechnical texts, and even with professional texts of chosen branches of science. According to the students' needs it concentrates on chosen grammar topics, but mainly intends to develop understanding of syntactic structures and typical rhetorical functions (e.g., various types of descriptions, and, if possible, a case study). Increasing emphasis is placed on the undergraduate's independent work with and reading of linguistically more demanding materials. The course extends the student's subtechnical vocabulary, and includes fundamental notions of chosen branches of science. It is focused on formal writing including the sentence and paragraph structure, linking, cohesion and coherence in texts.			
04XAP3	English for Advanced Students P3	Z	2
The AP3 course is based on AP2 and expects the student to work without any guidance with authentic professional materials and to interpret the 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; summarizing, writing an abstract) 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 informal language both in oral and written communication.			
04XCESM1	Czech for Foreigners - Intermediate 1	Z	2
The course is focused on correct pronunciation, important morphological phenomena, prepositional phrases, and verb forms as well as on extending the student's vocabulary for various social situations.			

04XCESM2	<b>Czech for Foreigners - Intermediate 2</b>	Z	2
The course develops the topics covered in CESM1 and is then focused on more difficult grammar phenomena. It practices writing, speaking, and reading skills and trains the student in understanding common abbreviations, abbreviated words, and mathematical terms and formulas.			
04XCESM3	<b>Czech for Foreigners - Intermediate 3</b>	Z	2
The last course revises morphological topics covered earlier and extends the student's knowledge of more difficult language phenomena. It is especially focused on stylistics and lexicology and on developing the student's writing skills.			
04XCESMZK	<b>Czech for Intermediate Students Examination</b>	ZK	4
The course content is the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of the CESM1,2,3 courses and can only be taken after successful completion of the 3 courses. Detailed information is to be obtained from the teacher.			
04XCESP1	<b>Czech for Foreign Students - Advanced 1</b>	Z	2
The prerequisite of the course is very good knowledge of the Czech language, i.e., communicative competences at least at level B2 of the Common European Framework of Reference. 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 includes communication with teachers and faculty administrators.			
04XCESP2	<b>Czech for Foreigners - Advanced 2</b>	Z	2
This course extends the student's knowledge acquired in CESP1 and focuses on difficult language phenomena. It practises working with technical and specialist texts placing greater emphasis on individual work.			
04XCESP3	<b>Czech for Foreigners - Advanced 3</b>	Z	2
The course develops the student's knowledge from CESP2. It includes working with authentic specialist materials, their interpretation and presentation, and, finally, presentation of the student's project. Writing skills necessary for professional communication are trained.			
04XCESPZK	<b>Czech for Foreign Students - Advanced Examination</b>	ZK	4
The course content is the examination as given by the study plan. The examination consisting of a written and oral part covers all the topics of the CESP1,2,3 courses and can only be taken after successful completion of the 3 courses. Detailed information is to be obtained from the teacher.			
04XCESZ1	<b>Czech for Foreigners - Beginners 1</b>	Z	2
The course is designed for students of the English programme. Students will become acquainted with the main characteristics of Czech (phonetic and grammar features) and they will acquire basic language and speaking skills. The course focuses on pronunciation exercises, simple social phrases, and oral and written communication in the most common everyday situations. The course covers roughly lessons 1-3 of eština Express (Czech Express) by L. Holá and P. Bo ilová.			
04XCESZ2	<b>Czech for Foreigners - Beginners 2</b>	Z	2
The language and communication competences acquired in CESZ1 are further developed. Students deepen their knowledge of the declension and conjugation system and practise basic communication topics. The course covers roughly lessons 3-5 in Czech Express by L. Holá and P. Bo ilová.			
04XCESZ3	<b>Czech for Foreigners - Beginners 3</b>	Z	2
The course further develops the language and communication competences acquired in the XCESZ1 and XCESZ2 courses. The teaching focuses on building up basic vocabulary, fixing correct pronunciation and deepening grammar, features through practice, as well as introducing the Czech culture. Students are asked to produce simple texts and they practise frequent types of dialogue. They also practise understanding texts in terms of main ideas or looking for specific details in texts. The course covers roughly lessons 5-7 in eština expres 1.			
04XFM1	<b>French for Intermediate Students M1</b>	Z	2
French - intermediate FM The objective of this three-semester course is to improve and further develop communication in the French language in both written and oral form. Students will be able to communicate in social interaction and in academic, scientific and professional environment. They will be able to use the language to transmit general and technical information and to solve problems. FM1 The course builds on and further develops linguistic competence acquired at secondary school. It revises, systemizes and expands language skills gained in previous study. The following topics are covered: University studies in our country and in France, writing of transactional letters, CV, personal statement, request, answer to an advert, French culture and geography, Paris. Topics of specialization: mathematics, physics. Reading technical and popular science texts, work based on these texts.			
04XFM2	<b>French for Intermediate Students M2</b>	Z	2
Course FM2 builds on FM1. Linguistic structures and competence acquired in previous study are systemized and expanded. Reading popular science texts, features typical for technical and scientific language (passives, nominalization, word formation). Topics: physics, power engineering, environment, Internet, success of French science and technology, French scientists, artists and architects. Description of an object, device, shapes, dimensions, material.			
04XFM3	<b>French for Intermediate Students M3</b>	Z	2
The course is focused on improvement and further development of linguistic competence acquired during the follow-up courses. Syntactic structures (subordinate and infinitive clauses, participle structures, compound tenses). Text summary. -Students prepare a written paper which will be delivered in form of an oral presentation in-class. The paper is linked to the field of students' future specialisation or to their interest and generally covers a technical /applied science topic. It is not a translation but a creative work compiled from French articles and one's own knowledge/experience. -Longer monologues on topics /situations set for the examination are prepared. Text structure, cohesion and coherence.			
04XFMZK	<b>French for Intermediate Students Examination</b>	ZK	4
The content is the examination as given by the study programme. The whole French programme is ended with an examination covering the contents of FM1-FM3. The examination consists of a written and oral part and is organized according to Examination Instructions, a document available on the web.			
04XFP1	<b>French for Advanced Students P1</b>	Z	2
FP advanced course The objective of this three-semester course is to improve and further develop communication in the French language in both written and oral form. Students will be able to communicate in social interaction and in academic, scientific and work environment. They will be able to use the language to transmit general and technical information and to solve problems. FP1 The course builds on and further develops linguistic competence acquired at secondary school. Difficult grammar topics are repeated and expanded: subjonctif, passé composé-imparfait, pronouns. The following specific topics are covered: University studies in our country and in France, writing of transactional letters, CV, personal statement, request, answer to an advert, environmental issues, success of French science and technology, chosen topics from French regional culture, Paris. Topics of specialization: mathematics, internet, physics, chemistry. Reading of technical and popular science texts, further work with these texts and interpretation.			
04XFP2	<b>French for Advanced Students P2</b>	Z	2
With the link to P1 contents, the course further develops language skills. Focus is put on reading popular science texts and on oral communication on given topics. Features typical of technical and scientific communication are stressed (passive voice, nominalization, word formation).			
04XFP3	<b>French for Advanced Students P3</b>	Z	2
The course is focused on systemization and improvement of acquired linguistic competence, skills and knowledge, and their use for communication in engineering environment. Special skill - translation of shorter texts (both from and into the language). Writing of a paper and making oral presentation in-class. The paper generally covers a technical /applied science topic. It is a creative work compiled from 3 French sources. Preparation of several set topics for oral examination.			
04XFPZK	<b>French for Advanced Students Examination</b>	ZK	4
The whole French program is ended with an examination covering the contents of FP1-FP3. The examination consists of a written and/or an oral part and is organized according to Examination Instructions, a document available on the web. Assessment of the presentation is included into the examination grading.			

04XFZ1	<b>French for Beginners Z1</b>	Z	2
French for beginners The objective of this 5-level course is to be able to communicate in French orally and in writing in situations of everyday life , in socializing and in professional life. The course includes French for specific / technical communication and reading of popular science and scientific texts. FZ1 The objective is to be able to communicate at elementary level, actively using the knowledge of chosen elementary language. The contents is roughly outlined by lessons 1 - 7 of the textbook Pravda - Pravdová, French for beginners (Francouzština pro začáteky). It is extended with situations of communication and functions from the textbook Espaces I, lessons 1-4 : introductions, personal information, asking and giving the directions, simple instructions and questions. Special attention is paid to pronunciation. Spelling is explained in connection with pronunciation and grammar.			
04XFZ2	<b>French for Beginners Z2</b>	Z	2
The course is linking up with FZ1. Elementary linguistic knowledge and communication skills are expanded. The scope is given by lessons 8 - 13 of the textbook: Pravda - Pravdová : French for Beginners . Additional topics and skills are filled in from the textbook Espaces I, lesson 1 - 5 (introductions, invitation, welcoming, agreement - disagreement, apology, thanking, travelling, map of France, food, expression of will, wish, order, prohibition, pleasure). Correct pronunciation is practiced. Stress on oral communication. Specific topics covered: How does the machine work? A few expressions concerning the study. Name of University and Faculty.			
04XFZ3	<b>French for Beginners Z3</b>	Z	2
The course builds upon FZ2. Basic linguistic knowledge and skills are developed. The contents is given by lessons 14 - 18 of the textbook: Pravda - Pravdová: French for Beginners. Topics, functions and situations are complemented from other materials. Stress is put on oral communication in dialogues and on reading, both for information and loud as part of pronunciation practice. Reading covers short adapted texts of general interest first, and later popular science texts.			
04XFZ4	<b>French for Beginners Z4</b>	Z	2
The course builds up on FZ3. Basic linguistic knowledge and skills are further developed. Oral communication and reading skills are practiced. The contents is roughly covered with lessons 19 - 23 of the textbook French for Beginners, and is expanded with topics and functions from other materials. Reading is developed from the lecture notes French for Engineering Students of FJFI. The course covers general and specific topics: health- illness, sport, free time, environment, study, travelling in France, Paris, shopping, weather, university in our country and in France, how to write CV, application, topics in mathematics, reading physics - mechanics, informatics, internet.			
04XFZ5	<b>French for Beginners Z5</b>	Z	2
All four skills acquired in FZ4 are further developed, as well as technical language. Students prepare a paper on a chosen popular science topic. They present it orally in the class. The general contents is covered by lessons 24 - 26 of the textbook: Pravda-Pravdova, French for Beginners, and is complemented from other materials. Topics: on physics from lecture notes, success of French science and technology, information about France. Grammar is systemized and complemented with syntax (subordinate clauses, typical conjunctions, subjunctive clauses, gerund, passive).			
04XFZZK	<b>French for Beginners Examination</b>	ZK	3
The content is the examination as given by the study plan. The course is terminated with an examination consisting of oral and written part. The examination is ruled by the document Instruction for examination. Its content covers the levels FZ1 - FZ5.			
04XNM1	<b>German for Intermediate Students M1</b>	Z	2
The objective of the course is to level off the students' skills in the German language. The course focuses on revision of more difficult phenomena and structures (e.g. the passive) and word formation processes (e.g. importance of verb prefixes). In the lexical part, it covers topics referring to higher education in both the Czech Republic and Germany, current environmental issues together with all necessary expressions and phrases, expressions and phrases needed to chemists, mathematicians, physicists, and the fundamentals of IT terminology. It develops communication on related topics and is aimed at correct pronunciation, grammatical correctness and understandability.			
04XNM2	<b>German for Intermediate Students M2</b>	Z	2
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).			
04XNM3	<b>German for Intermediate Students M3</b>	Z	2
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).			
04XNMZK	<b>German for Intermediate Students Examination</b>	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 consisting of two parts - written and oral, which cover the courses NM1 - NM3. The oral part follows after passing the written part successfully and after obtaining the 04XNM3 assessment. More detailed information is to be obtained from the teacher.			
04XNP1	<b>German for Advanced Students P1</b>	Z	2
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.			
04XNP2	<b>German for Advanced Students P2</b>	Z	2
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 oral (CV, letter of application, interview, scholarship), and more complex grammatical structures (i.e., subjunctive, indirect speech).			
04XNP3	<b>German for Advanced Students P3</b>	Z	2
The course consists of 3 main parts (general communicative situations, grammar and technical topics). Students will develop their vocabulary in a variety of less common situations (traffic problems and car accidents, accident report, filling in a form, complaints). Based on presentations and technical and subtechnical texts, the vocabulary range in fields such as nuclear power engineering, the environment, computer science, and car technology, will also be extended. Only authentic professional texts are used. By means of a presentation, students are trained to process information gained from their reading of complex and difficult texts and present it to the class in a simplified oral form. The course also includes translation practice to and from German.			
04XNPZK	<b>German for Advanced Students Examination</b>	ZK	4
The course content is the examination as given by the study plan. The whole German for Advanced Students Course is completed by an examination consisting of two parts - written and oral, which cover the courses NP1 - NP3. The oral part follows after passing the written part successfully and after obtaining the 04XNP3 ungraded assessment. More detailed information is to be obtained from the teacher.			
04XRM1	<b>Russian for Intermediate Students M1</b>	Z	2
The course is designed for students with previous knowledge of Russian from secondary schools. Students are supposed to know the Russian alphabet (both printed and handwritten), basic vocabulary for communication in everyday situations (introductions, socializing, greetings, shopping for food and objects of everyday need, asking the way and giving directions), they can use basic grammar structures (verbal and nominal forms, irregular verbs, pronouns). The initial knowledge corresponds to the achievement level of the RZ2 course. The contents and scope of the course correspond approximately to the RZ3 course, but for half of the time allotted in the timetable.			

04XRM2	Russian for Intermediate Students M2 The course is based on the RM1 course, its contents and scope correspond roughly to RZ4, however, for half of the time allotted in the timetable.	Z	2
04XRM3	Russian for Intermediate Students M3 The course develops the knowledge and skills acquired in RM1 and RM2 and its contents and scope are roughly at the same level as those of RZ5, however, for half of the time allotted in the timetable.	Z	2
04XRMZK	Russian for Intermediate Students Examination The course content is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowledge and skills acquired in RM1 - RM3. Students are eligible for the oral examination only after a prior pass in RM3 and a successful written examination. Students are given instructions by the teacher.	ZK	4
04XRP1	Russian for Advanced Students P1 The entrance requirement for the course is to achieve the B1 CEFR level. The objective of the course is revision of standard language structures, practicing more difficult grammar structures, understanding the fundamentals of technical language and training writing skills.	Z	2
04XRP2	Russian for Advanced Students P2 The course is based on RP1. It expands grammatical structures important for understanding technical texts (verbal adjectives, participles, passives, verb aspects, specific syntactic structures). Stress is put on independent oral and written communication.	Z	2
04XRP3	Russian for Advanced Students P3 The course is based on RP2 and is mainly focused on working with technical and scientific texts (reading comprehension, oral and written paraphrasing, translation). The RP1 - RP3 courses require good previous knowledge of general language at secondary level (listening, reading, correct communication in everyday situations). The courses develop and expand these skills. Further study is aimed at professional and technical skills (reading technical literature according to the students' specialization, oral and written interpretation). Students develop their subtechnical vocabulary and practice quick and correct communication in professional situations. They will be able to both speak write accurately and with confidence on technical topics.	Z	2
04XRPZK	Russian for Advanced Students Examination The course content is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowledge and skills acquired in RP1 - RP3. Students are eligible for the oral examination only after a prior pass in RP3 and a successful written examination. Students are given instructions by the teacher.	ZK	4
04XRZ1	Russian for Beginners Z1 The course represents the first stage of the five-semester programme, its final aim being reading and understanding professional texts written in Russian. Thus it begins with mastering the Russian alphabet (for both reading and writing skills) and fundamentals of grammar necessary for everyday communication (listening and speaking). Students will be able to read a short text with marked stress, understand its contents and summarize it.	Z	2
04XRZ2	Russian for Beginners Z2 The second semester of the programme is designed to teach skills for basic communication in everyday situations and for reading easy and short subtechnical texts. Students will be able to communicate using short sentences and appropriate structures, and read aloud with confidence a short text without marked stress. They will also develop their vocabulary and master further grammatical structures. They will have mastered with confidence the Russian alphabet and will be able to use it in writing.	Z	2
04XRZ3	Russian for Beginners Z3 The course is based on RZ2 and includes further everyday topics, develops understanding of short compact texts on new subtechnical topics (for training various forms of reading skills and listening) and introduces new grammar. Students will be trained to distinguish intonation patterns while listening to spoken language. They will be able to respond so as to be understood, and to express their opinion. Writing skills will be trained on guided writing tasks and note-taking.	Z	2
04XRZ4	Russian for Beginners Z4 The course is based on RZ3. It improves and expands the knowledge of general language in all four skills (reading and understanding longer texts with a certain percentage of unfamiliar words, oral communication in everyday situations, writing longer texts). Students are trained to use grammar structures effectively (e.g., irregular verbs, differences in verb patterns from Czech, modality, imperatives, conditionals). They practice and develop communication skills for everyday situations (food, travelling, free time), and practice oral and written communication on more specific topics (environment, addictions, the green movement). They become acquainted with various geographical data (e.g., Siberia), learn how to fill in forms, look up the information from the timetable, learn about Russian holidays and typical meals.	Z	2
04XRZ5	Russian for Beginners Z5 The course expects the student to have completed RZ4. It concentrates predominantly on reading skills (working with professional texts, i.e. understanding, extracting and summarizing information from a specialized text) and speaking, and to a certain extent, writing about the professional information obtained by reading the texts. Communication skills are trained on everyday topics. Studying grammar is based on professional and technical texts and only includes items typically used in professional communication (verbal adjectives, participles, passive voice). Students develop their technical and economic vocabulary, and are also trained in some professional skills (writing a CV, polite request, etc.)	Z	2
04XRZZK	Russian for Beginners Examination The course content is the examination as given by the study plan. The course is completed by taking a written and oral examination testing the knowledge and skills acquired in RZ1 - RZ5. Students are eligible for the oral examination only after a prior pass in RZ5 and a successful written examination. Students are given instructions by the teacher.	ZK	3
04XSM1	Spanish for Intermediate Students M1 The course is designed for students whose competence is at level B1 of CEFR, i.e. those who studied Spanish in the secondary school. The 3-semester course develops standard vocabulary and pays attention to further grammar topics (e.g., perfrasis verbales, futuro imperfecto, direct object and indirect object pronouns, negative form of the imperative, and subjunctive), to written and oral communication on a given everyday or easy subtechnical topic, for which the students are trained by reading texts or listening to them.	Z	2
04XSM2	Spanish for Intermediate Students M3 The course develops the students' knowledge from the previous course (SM1). Students are gradually acquainted with fundamentals of Spanish for specific purposes in order to be able to work with specialized texts on the Internet.	Z	2
04XSM3	Spanish for Intermediate Students M3 The course books are supplemented with additional subtechnical materials, so the students will be gradually acquainted with the peculiarities of academic style. They will be competent enough to use the Internet in Spanish and search for information of their specialization or field of interest. Students will use the information to write short articles and summaries. The final part of the programme, general Spanish course based on course books, covers presentations and, finally, a written and oral examination.	Z	2
04XSMZK	Spanish for Intermediate Students Examination The course content is the examination as given by the study plan. SMZK examination consists of two parts - written and oral; to be eligible for the written part, students will have obtained non-graded assessment for course SM3. Oral examination follows the written part.	ZK	4
04XSP1	Spanish for Advanced Students P1 Course concentrates on more difficult grammar topics, revision of vocabulary, basics of Spanish for specific purposes as well as written communication. Course prerequisites: level B2 of CEFR.	Z	2
04XSP2	Spanish for Advanced Students P2 Course SP2 is the second part of the advanced Spanish course, extending Spanish for specific purposes topics. It comprises more grammar and syntax and focuses on independent written communication.	Z	2

04XSP3	Spanish for Advanced Students P3	Z	2
Course SP3 is the final part of the advanced Spanish course. It is based on texts chosen by the students according to their future specialization. It is focused on written communication based on what students will need in their career.			
04XSPZK	Spanish for Advanced Students Examination	ZK	4
The course content is the examination as given by the study plan. Examination SPZK consists of two parts, namely oral and written. The prerequisite for admission to oral part is having passed the written test. Examination content is based on syllabi of courses SP1, SP2, and SP3 or on an individual study plan of the student.			
04XSZ1	Spanish for Beginners Z1	Z	2
Course SZ1 is the first stage of the five-semester programme of Spanish studies; during the first stage the students will master phonetics and fundamental grammar structures and will be able to communicate at an elementary level on topics of everyday life. They will acquire and extend fundamental vocabulary of general Spanish and will develop it.			
04XSZ2	Spanish for Beginners Students Z2	Z	2
Course SZ2 is based on course SZ1, and expects students to develop and extend the knowledge and skills acquired so far. Grammar structures and lexis will be chosen so as to enable them to understand short adapted written texts and speech. Attention is also paid to cultural differences between Spanish-speaking countries and others such as the Czech Republic. Realia of Spanish-speaking countries are also included.			
04XSZ3	Spanish for Beginners Z3	Z	2
The course is based on course SZ2, and develops the student's vocabulary and grammar structure. The course covers realia (history and culture) of the Spanish-speaking countries, mainly of Spain. It pays attention to further grammar topics (pretérito perfecto, pretérito indefinido, pretérito imperfecto, the gerund and the imperative). It includes written and oral communication on a given general topic, for which the student is trained by reading texts or listening to them.			
04XSZ4	Spanish for Beginners Z4	Z	2
The course is based on course SZ3. It develops the student's vocabulary and extends the knowledge of the culture and social customs of the Spanish speaking countries, mainly of Spain. It pays attention to further grammar topics (perífrasis verbales, futuro imperfecto, direct object and indirect object pronouns, negative form of the imperative, and subjunctive), to written and oral communication on a given general or subtechnical topic, for which the student is trained by reading texts or listening to them.			
04XSZ5	Spanish for Beginners Z5	Z	2
The course books are supplemented with additional subtechnical materials, so the students will be gradually acquainted with peculiarities of Spanish for specific purposes. In its final part, the general Spanish course based on the course book will end with presentations and, finally, a written and oral examination.			
04XSZZK	Spanish for Beginners Examination	ZK	3
The course content is the examination as given by the study plan. Examination consists of two parts - written and oral. Student can register for oral examination only if he/she has passed the written examination test.			
12NME1	Numerical Methods 1	Z,ZK	4
There are explained the basic principles of numerical mathematics important for numerical solving of problems important for physics and technology. Methods for solution of tasks very important for physicists (ordinary differential equations, random numbers) are included in addition to the basic numerical methods. Integrated computational environment MATLAB is used as a principle programming language as a demonstration tool. The seminars are held in computer laboratory.			
12PAS	Computer Algebra Systems	Z	2
Practically oriented introduction to computer algebra systems (CAS): their main characteristics, ways and means of using them. Constituent part is realized in computer classrooms: students acquire basic skills with CAS by solving relatively simple and basic tasks from mathematics and physics.			
12UNXAP	Introduction to UNIX	Z	2
Computer and operating systems. Personal computer, workstation and supercomputers. Processor, memory, bus, devices, hard disk, network interface. Hardware and software. Principles of operating systems. Operating system UNIX. Basic principles, kernel, kernel services. Documentation. File system, file attributes, working with files. Text editors: vi, emacs. Command interpreter (shell) bash and its programming (scripts). Controlling processes, process status, computer load a process priorities. Standard tools. Graphical user interface X-windows. Computer networks. Local computer networks. Global computer networks. Addresses and protocols TCP/IP. Network configuration of a computer. Network services: hardware sharing, mail, scp, etc. Network applications			
12UVP	Introduction to Scientific Computing	Z	2
Practically oriented Introduction to scientific computing. Constituent part of the course is realized in computer classroom. Students get acquainted with some basic tools for scientific and technical computing, data analysis, data visualisation and algorithm development.			
12ZEL1	Basic Electronics 1	Z,ZK	3
The subject provides primary knowledge of circuit theory concerning principles of electronic circuits in both stationary and harmonic stable state. Circuit analysis methods for linear circuits include symbolic and complex method are explained. Proper circuit analysis is also lectured. The subject's final part deals with transient effects inside linear circuits.			
12ZEL2	Basic Electronics 2	Z,ZK	3
The subject follows up with the Basic Electronics 1. Semiconductor elements basic properties are explained. The course's final part deals with basic themes of logical circuits field.			
18EKN	Econometrics	Z,ZK	4
Econometrics is based on economic theory and the relations between economic quantities are expressed by mathematical tools and observed data from economic reality. The course covers basic instruments of econometric analysis as the basic econometric model, the generalized model, the system of simultaneous equations and instruments for econometric model verification.			
18INTA	Development of internet applications	KZ	4
The lectures provide an overview of modern technologies for the development of web applications. Students will learn basic web languages and concepts (HTML, URL, etc.) and they will also be introduced to relational database systems. The tutorials are dedicated to practical examples of building web applications, from the simplest to more advanced. The course is oriented primarily towards backend technologies and using the Python languages, but covers also frontend frameworks and JavaScript.			
18MAK1	Macroeconomics 1	Z,ZK	4
Macroeconomics I provides students with a fundamental theoretical basis for understanding how an economy works. It introduces main macroeconomic indicators, money market, macroeconomic equilibrium theory, fundamentals of open economy theory, inflation, unemployment, economic growth, economic fluctuations, basic macroeconomic models of IS-LM, AS-AD and their implications for economic policies. The learning outcomes of the course is to equip students with ability to analyze macroeconomic phenomena and their interconnections and subsequently to use 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 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 modeling.			
18MIK	Microeconomics	Z,ZK	4
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 these processes and makes more clear behaviour of the economic agents. Lectures and seminars are designed so that the explanation of microeconomic concepts does not require knowledge of calculus.			

18PJ	<b>Programming in Java</b> This course is devoted to the Java platform and to the development of the basic types of applications for this platform.	Z,ZK	5
18PMTL	<b>Programming in MATLAB</b> Introducing Matlab environment as efficient tool for computation in complex arrays and symbolic variables, namely for linear algebra, mathematic analysis, statistics, algorithmization and geometric representation of results.	KZ	4
18PPY1	<b>Programming in Python 1</b> This course introduces students to advanced features of the Python language and common scientific packages. The course covers both object-oriented as well as functional programming paradigms. The following part of the course describes the use of Python in the fields of scientific and technical computing (NumPy and SciPy packages), data processing and visualization.	Z	2
18PPY2	<b>Programming in Python 2</b> This course introduces students to practical applications of the Python language in scientific as well as commercial fields. The course is a seminar where each presented topic is accompanied by a short demo of a real-world application in the specific field.	Z	2
18PPY3	<b>Programming in Python 3</b> This advanced course is intended for students who have basic experience with programming in Python and using its libraries. It introduces students to advanced concepts of the Python language and modules they are based on.	Z	2
18PRC1	<b>Programming in C++ 1</b> This course covers mainly the C programming language and non-object oriented features of the C++ language.	Z	4
18PRC2	<b>Programming in C++ 2</b> This course covers the object oriented programming and other advanced constructs in the C++; programming language and the Standard Template Library.	KZ	4
18PROP	<b>Practical training in programming</b> The goal of this course is to understand advanced topics related to programming, code design and software project development. Students will practice pragmatic techniques and principles on concrete real-world examples. Emphasis is put on the review of freely available software tools that can improve the programmers work efficiency and ensure high quality of the final source code.	KZ	3
18PW	<b>Web environment and markup languages</b> The course introduces students to fundamental principles and best practices for web design with respect to technical functionality, informational value, readability and usability.	KZ	2
18ZALG	<b>Basics of Algorithmization</b> This course is devoted to selected algorithms and methods for algorithm design. This course introduces selected methods for the determination of the algorithm complexity.	Z,ZK	4
18ZPRO	<b>Basics of Programming</b> This course is intended mainly for students with little or no experience in programming. It familiarizes the students with the basic concepts in programming and with the Python programming language.	Z	4
TV-1	Physical Education	Z	1
TV-2	Physical Education	Z	1
TV-3	Physical education	Z	1
TV-4	Physical education	Z	1

For updated information see <http://bilakniha.cvut.cz/en/FF.html>

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