

# Study plan

## Name of study plan: Open Electronic Systems

Faculty/Institute/Others: Faculty of Electrical Engineering

Department:

Branch of study guaranteed by the department: Common courses

Garantor of the study branch:

Program of study: Open Electronic Systems

Type of study: Bachelor full-time

Required credits: 181

Elective courses credits: -1

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: 82

The role of the block: P

Code of the group: BOESBAP

Name of the group: Bachelor Thesis

Requirement credits in the group: In this group you have to gain at least 9 credits (at most 144)

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

Credits in the group: 9

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
A8B01BAP	<b>Bachelor thesis</b>	Z	9	0P+7S	Z,L	P
A8B02BAP	<b>Bachelor thesis</b>	Z	9	7s	L	P
A8B14BAP	<b>Bachelor thesis</b>	Z	9	7s	L	P
A8B15BAP	<b>Bachelor thesis</b>	Z	9	7s	L	P
A8B16BAP	<b>Bachelor thesis</b>	Z	9	7s	Z,L	P
A8B17BAP	<b>Bachelor thesis</b>	Z	9	7S	L	P
A8B31BAP	<b>Bachelor thesis</b>	Z	9	7ZP	L	P
A8B32BAP	<b>Bachelor thesis</b>	Z	9	0P + 7S	L	P
A8B33BAP	<b>Bachelor thesis</b>	Z	9	7S	L	P
A8B34BAP	<b>Bachelor thesis</b>	Z	9	7C	L	P
A8B35BAP	<b>Bachelor thesis</b>	Z	9	7S	L	P
A8B36BAP	<b>Bachelor thesis</b>	Z	9	7s	L,Z	P
A8B37BAP	<b>Bachelor thesis</b>	Z	9	7s	L	P
A8B38BAP	<b>Bachelor thesis</b>	Z	9	0P+7C	L	P
A8B39BAP	<b>Bachelor thesis</b>	Z	9	7S	L	P
ABAP9	<b>Bachelor thesis</b>	Z	9	28s	L	P

### Characteristics of the courses of this group of Study Plan: Code=BOESBAP Name=Bachelor Thesis

A8B01BAP	Bachelor thesis	Z	9
A8B02BAP	Bachelor thesis	Z	9
Independent final project for the Bachelor's degree study programme. A student will choose a topic from a range of topics related to his or her branch of study, which will be specified by branch department or branch departments. The Bachelor's project will be defended in front of the board of examiners for the comprehensive final examination.			
A8B14BAP	Bachelor thesis	Z	9
A8B15BAP	Bachelor thesis	Z	9
A8B16BAP	Bachelor thesis	Z	9

A8B17BAP	Bachelor thesis	Z	9
Independent final project for the Bachelor's degree study programme. A student will choose a topic from a range of topics related to his or her branch of study, which will be specified by branch department or branch departments. The Bachelor's project will be defended in front of the board of examiners for the comprehensive final examination. Bachelor, s projects are oriented into microwave technique, antennas, propagation, optoelectronics, EMC, medical applications.			
A8B31BAP	Bachelor thesis	Z	9
A8B32BAP	Bachelor thesis	Z	9
Independent final project for the Bachelor's degree study programme. A student will choose a topic from a range of topics related to his or her branch of study, which will be specified by branch department or branch departments. The Bachelor's project will be defended in front of the board of examiners for the comprehensive final examination.			
A8B33BAP	Bachelor thesis	Z	9
A8B34BAP	Bachelor thesis	Z	9
Independent final project for the Bachelor's degree study programme. A student will choose a topic from a range of topics related to his or her branch of study, which will be specified by branch department or branch departments. The Bachelor's project will be defended in front of the board of examiners for the comprehensive final examination.			
A8B35BAP	Bachelor thesis	Z	9
A8B36BAP	Bachelor thesis	Z	9
Independent final project for the Bachelor's degree study program. Student will choose a topic from a range of topics related to his or her branch of study that will be specified by branch department or branch departments. The Bachelor's project will be defended in front of the board of examiners for the comprehensive final examination.			
A8B37BAP	Bachelor thesis	Z	9
Independent final project for the Bachelor's degree study programme. A student will choose a topic from a range of topics related to his or her branch of study, which will be specified by branch department or branch departments. The Bachelor's project will be defended in front of the board of examiners for the comprehensive final examination.			
A8B38BAP	Bachelor thesis	Z	9
Independent final project for the Bachelor's degree study program. A student will choose a topic from a range of topics related to his or her branch of study, which will be specified by branch department or branch departments. The Bachelor's project will be defended in front of the board of examiners for the comprehensive final examination.			
A8B39BAP	Bachelor thesis	Z	9
ABAP9	Bachelor thesis	Z	9

Code of the group: BOESBBE

Name of the group: Safety of the bachelor's studies

Requirement credits in the group:

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

Credits in the group: 0

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
BEZB	<b>Safety in Electrical Engineering for a bachelor's degree</b> Vladimír Kůla, Ivana Nová, Radek Havlíček Vladimír Kůla Vladimír Kůla (Gar.)	Z	0	2BP+2BC	Z,L	P
BEZZ	<b>Basic health and occupational safety regulations</b> Vladimír Kůla, Ivana Nová, Radek Havlíček Vladimír Kůla Vladimír Kůla (Gar.)	Z	0	2BP+2BC	Z	P

**Characteristics of the courses of this group of Study Plan: Code=BOESBBE Name=Safety of the bachelor's studies**

BEZB	Safety in Electrical Engineering for a bachelor's degree	Z	0
The purpose of the safety course is to give the students basic knowledge of electrical equipment and installation as to avoid danger arising from operation of it. This introductory course contains fundamentals of Safety Electrical Engineering. In this way the students receive qualification of instructed person that enables them to work on electrical equipment.			
BEZZ	Basic health and occupational safety regulations	Z	0
The guidelines were worked out based on The Training Scheme for Health and Occupational Safety designed for employees and students of the Czech Technical University in Prague, which was provided by the Rector's Office of the CTU. Safety is considered one of the basic duties of all employees and students. The knowledge of Health and Occupational Safety regulations forms an integral and permanent part of qualification requirements. This program is obligatory.			

Code of the group: BOESP

Name of the group: Compulsory subjects of the programme

Requirement credits in the group: In this group you have to gain 73 credits

Requirement courses in the group: In this group you have to complete at least 12 courses

Credits in the group: 73

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
A8B14ADP	<b>Algorithm Development and Programming</b> Radek Havlíček, Jiří Zděnek Jiří Zděnek (Gar.)	Z,ZK	5	2P+2C	Z	P
A8B01DEN	<b>Differential Equations&amp;Numerical Methods</b> Petr Habala Petr Habala (Gar.)	Z,ZK	7	4P+2C	L	P
A8B01DMG	<b>Discrete Math.&amp; Graphs</b> Marie Demlová Marie Demlová (Gar.)	Z,ZK	5	3P+1S	Z	P

A8B02PH1	<b>Physics 1</b> <i>Petr Kulhánek, Petr Koníček Petr Kulhánek (Gar.)</i>	Z,ZK	7	4P+2L	L	P
A8B02PH2	<b>Physics 2</b> <i>Petr Kulhánek, Petr Koníček, Jan Koller, Michal Bednařík Jan Koller (Gar.)</i>	Z,ZK	7	4P+2L	Z	P
A8B01LAG	<b>Linear Algebra</b> <i>Pavel Pták, Matěj Dostál</i>	Z,ZK	7	4P+2S	Z	P
A8B01MC1	<b>Mathematics-Calculus1</b> <i>Josef Tkadlec, Josef Hekrdla, Petr Olšák Josef Tkadlec (Gar.)</i>	Z,ZK	7	4P+2S	Z	P
A8B01MCT	<b>Mathematics-Complex Variable and Integral Transforms</b> <i>Jan Hamhalter, Veronika Sobotíková, Martin Bohata Jan Hamhalter (Gar.)</i>	Z,ZK	7	4P+2S	Z	P
A8B01MCM	<b>Mathematics-Calculus m-D</b> <i>Petr Hájek, Jaroslav Tišer Petr Hájek Jaroslav Tišer (Gar.)</i>	Z,ZK	7	4P+2S	L	P
A8B01AMA	<b>Advanced Matrix Analysis</b> <i>Pavel Pták Pavel Pták (Gar.)</i>	Z,ZK	4	3P+1S	L	P
A8B01OGT	<b>Optimization and Game Theory</b> <i>Martin Bohata Martin Bohata Martin Bohata (Gar.)</i>	Z,ZK	4	3P+1S	L	P
A8B01PSI	<b>Probability, Statistics and Information Theory</b> <i>Mirko Navara, Milan Petřík, Miroslav Korbelař, Matěj Novotný Mirko Navara (Gar.)</i>	Z,ZK	6	4P+2S	Z	P

### Characteristics of the courses of this group of Study Plan: Code=BOESP Name=Compulsory subjects of the programme

A8B14ADP	Algorithm Development and Programming	Z,ZK	5
Course objective: Introduction to algorithm design of basic and more advanced computer tasks, Digital computer structure, Introduction to the C programming language, Syntax and semantics. Basic skills of procedural programming paradigm, variable, data type, declaration, operators, expressions, statements, functions, parameter passing, arrays, pointers, structures, compilation and debugging methods, preprocessor, conditional compilation, standard libraries, specific of embedded computer systems programming and debugging.			
A8B01DEN	Differential Equations&Numerical Methods	Z,ZK	7
This course offers an introduction to differential equations and numerical methods. We survey major types of ordinary differential equations and introduces partial differential equations. For common problems (roots, systems of linear equations, ODE?s) we will show basic approaches for solving them numerically.			
A8B01DMG	Discrete Math.& Graphs	Z,ZK	5
The course introduces basic notions from discrete mathematics directed to those topics useful for electrical engineering studies. The content of the course covers: infinite sets with emphasis to cardinality of sets, binary relations with emphasis to equivalence relations and partial orders; integers, relation modulo n; basic algebraic structures (including finite fields of characteristic 2). Further the course contains basic notions and their applications from graph theory.			
A8B02PH1	Physics 1	Z,ZK	7
The basic course of physics at the Faculty of Electrical Engineering - Physics 1, is devoted to the introduction into two important areas of physics. The first one is a classical mechanics and the second one is the electric and magnetic field. Within the framework of the classical mechanics, the students study the particle kinematics; dynamics of the mass particle, system of mass particles and rigid bodies. The students should be able to solve basic problems dealing with the description of mechanical systems, which they can meet during their further studies. The classical mechanics is followed by the relativistic mechanics, electric and magnetic field - both stationary as well as non-stationary. The students can use the facts gained in this course in the study of electrical circuits, theory of electrotechnical materials or radioelectronics. Apart of this, the knowledge gained in this course is required for the study of the consecutive course Physics 2.			
A8B02PH2	Physics 2	Z,ZK	7
The course Physics 2 is closely linked with the course Physics 1. Within the framework of this course the students will first of all learn foundations of phenomenological and statistical thermodynamics. Following topic - the theory of waves - will give to the students basic insight into the properties of waves and will help to the students to understand that the presented description of the waves has a universal character in spite of the waves character. Particular types of waves, such as acoustic or electromagnetic waves are the subjects of the following section. Quantum mechanics physics will complete the student's general education in physics. The knowledge gained in this course will help to the students in study of modern technical areas encountered during their studies and will allow them to understand the principles of novel technologies and functioning of new electronic devices.			
A8B01LAG	Linear Algebra	Z,ZK	7
This course covers introductory topics of linear algebra. The main focus is on the related notions of linear spaces and linear transformations (linear independence, bases and coordinates) and matrices (determinants, inverse matrix, matrix of a linear mapping, eigenvalues). Applications include solving systems of linear equations, geometry in 3-space (including dot product and cross product), and solving linear differential equations.			
A8B01MC1	Mathematics-Calculus1	Z,ZK	7
The aim of the course is to introduce students to basics of differential and integral calculus of functions of one variable.			
A8B01MCT	Mathematics-Complex Variable and Integral Transforms	Z,ZK	7
A8B01MCM	Mathematics-Calculus m-D	Z,ZK	7
The subject covers an introduction to the differential and integral calculus in several variables and basic relations between curve and surface integrals. Other part contains function series and power series with application to Taylor and Fourier series.			
A8B01AMA	Advanced Matrix Analysis	Z,ZK	4
This is a continuation of linear algebra. A relatively good knowledge of basic notions of linear algebra is supposed. The aim is to explain spectral theorems and their applications. Further Jordan form of a matrix and functions of a matrix are studied.			
A8B01OGT	Optimization and Game Theory	Z,ZK	4
A8B01PSI	Probability, Statistics and Information Theory	Z,ZK	6
Basics of probability theory, mathematical statistics, information theory, and coding. Includes descriptions of probability, random variables and their distributions, characteristics and operations with random variables. Basics of mathematical statistics: Point and interval estimates, methods of parameters estimation and hypotheses testing, least squares method. Basic notions and results of the theory of Markov chains. Shannon entropy, mutual and conditional information.			

Code of the group: BOESZAJ

Name of the group: Exam from the english language

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
A0B04B2Z	English language B2-exam Pavla Péterová	Z,ZK	0	0C	Z,L	P

**Characteristics of the courses of this group of Study Plan: Code=BOESZAJ Name=Exam from the english language**

A0B04B2Z	English language B2-exam	Z,ZK	0
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Name of the block: Compulsory courses of the specialization

Minimal number of credits of the block: 91

The role of the block: PO

Code of the group: BOESPO

Name of the group: Compulsory subjects of the branch

Requirement credits in the group: In this group you have to gain 91 credits

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

Credits in the group: 91

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
A8B31AAC	<b>Analog and Active Circuits</b> Jiří Hospodka, Jiří Náhlík Ivan Zemánek (Gar.)	Z,ZK	6	3P+2S	Z	PO
A8B37DCM	<b>Digital Communications</b> Jan Sýkora Jan Sýkora (Gar.)	Z,ZK	5	4P+0C	Z	PO
A8B37DIT	<b>Digital Design</b> Petr Skalický Petr Skalický (Gar.)	Z,ZK	5	2P+2C	L	PO
A8B32DSP	<b>Digital Signal Processing</b> Pavel Zahradník, Boris Šimák Pavel Zahradník (Gar.)	Z,ZK	5	3P + 1L	Z	PO
A8B17ELD	<b>Electrodynamics</b> Zbyněk Škvor, Lukáš Jelínek Lukáš Jelínek Zbyněk Škvor (Gar.)	Z,ZK	5	3P+1S	L	PO
A8B38EME	<b>Electronic Measurements</b> Jan Holub, Petr Kašpar Jan Holub (Gar.)	KZ	4	2P+1L	L	PO
A8B34EOD	<b>Electronic and Optoelectronic Devices</b> Pavel Hazdra Pavel Hazdra (Gar.)	Z,ZK	6	3P+2L	Z	PO
A8B34SST	<b>Solid State Physics</b> Jan Voves Jan Voves (Gar.)	Z,ZK	4	3P+1C	L	PO
A8B32DCL	<b>Digital Signal Processing and Communication Laboratory</b> Pavel Zahradník Lukáš Kencel Pavel Zahradník (Gar.)	Z	2	0P + 2C	Z	PO
A8B01CAS	<b>Computer Algebra Systems (CAS)</b> Aleš Němeček (Gar.)	Z	2	1P+1C	Z	PO
B6B32PSI	<b>Computer Networks</b> Zbyněk Kocur, Tomáš Vaněk, Jan Kubr, Leoš Boháč Leoš Boháč (Gar.)	Z,ZK	5	2P + 2C + 3D	Z	PO
A8B37SAS	<b>Signals and Systems</b> Jan Sýkora, Pavel Puričér, Karel Fliegel, František Vejražka Karel Fliegel František Vejražka (Gar.)	Z,ZK	8	4P+2C	L	PO
A8B17EMT	<b>Electromagnetic Field Theory</b> Zbyněk Škvor, Lukáš Jelínek Lukáš Jelínek Lukáš Jelínek (Gar.)	Z,ZK	8	4P+2S	Z	PO
A8B31CIR	<b>Circuit Theory</b> Ivan Zemánek Ivan Zemánek (Gar.)	Z,ZK	8	4P+2S	L	PO
A8B37SSP	<b>Statistical Signal Processing</b> Jan Sýkora, Pavel Sovka Jan Sýkora (Gar.)	Z,ZK	6	4P+0C	L	PO
A8B35FCS	<b>Feed-Back Control Systems</b> Michael Šebek, Jindřich Fuka Michael Šebek (Gar.)	Z,ZK	6	4P+2L	L	PO
A8B31ELE	<b>Elements of Electronics</b> Ivan Zemánek, Jan Sýkora, Pavel Zahradník, Zbyněk Škvor, Pavel Hazdra Ivan Zemánek (Gar.)	KZ	4	2P	L	PO
A8B32IES	<b>Introduction to Electronic Systems</b> Ivan Zemánek, Jan Sýkora, Pavel Zahradník, Zbyněk Škvor, Pavel Hazdra Ivan Zemánek (Gar.)	Z	2	0P + 2L	Z	PO

**Characteristics of the courses of this group of Study Plan: Code=BOESPO Name=Compulsory subjects of the branch**

A8B31AAC	Analog and Active Circuits	Z,ZK	6
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The subject AE8B31AAC is oriented on presentation, mathematical description, analysis and synthesis of basic analogue active circuits and function blocks of electronic systems based on basic semiconductor electronic components operating in linear and non-linear modes.

A8B37DCM	Digital Communications	Z,ZK	5
The course provides fundamentals of digital communications theory: modulation, classical coding, channel models, and basic principles of decoding. The exposition is systematically built along the theoretical lines which allow to reveal all inner connections and principles. This allows students to develop the knowledge and use it in an active way in a design and construction of the communication systems. The course provides a necessary fundamental background for subsequent more advanced communications theory courses.			
A8B37DIT	Digital Design	Z,ZK	5
The goal of this course is to introduce the philosophy of digital circuits' design, to provide formal description of combinational and sequential logical circuits, their functional blocks. Both mathematical and functional description, as well as minimization algorithms for output and transient functions of digital components and circuits is presented. Karnaugh maps, latch elements, finite-state Mealy and Moore machines are the essential part of the content. The subject matter discussed will be tested on the typical design of digital circuits.			
A8B32DSP	Digital Signal Processing	Z,ZK	5
This subject is focused upon basics in the digital signal processing, systems and methods for digital signal processing.			
A8B17ELD	Electrodynamics	Z,ZK	5
The course AEB17ELD (electrodynamics) is a follow up of the course AEB17EMT (Electromagnetic field theory). The course starts with a decomposition of electromagnetic field into planewaves, introduces radiation of waves and guides student through the interaction of electromagnetic waves with material boundaries. The theory of wave guides and transmission lines is also shown. The course ends with wave scattering. The knowledge gained in this course is needed for number of specialized master courses.			
A8B38EME	Electronic Measurements	KZ	4
The course is focused to metrology fundamentals and uncertainty apparatus. It explains both elementary principles and selected advanced methods used in electronics, telecommunications and radio communications.			
A8B34EOD	Electronic and Optoelectronic Devices	Z,ZK	6
This course introduces the basic theory, principles of operation and properties of electronic and optoelectronic devices. Physical principles of operation, device structures and characteristics are explained together with adequate models for small- and large-signal. Basic applications in analogue and digital electronics are examined. In seminars and labs, students are introduced to basic principles of device simulation, measurement of device characteristics and extraction of device parameters. Operation of electron devices in electronic systems is then analyzed using the PSpice simulator.			
A8B34SST	Solid State Physics	Z,ZK	4
The subject is aimed on solid state physics including some parts of statistical physics. The subject informs about basic properties of materials used in electronics, esp. about semiconductors.			
A8B32DCL	Digital Signal Processing and Communication Laboratory	Z	2
This is a shared practical laboratory jointly practicing theoretical foundations gained in Digital Signal Processing (B-DSP), Digital Communications (B-DCM) and Data Network Theory (B-DNT) courses. It demonstrates how these areas together allow designing a complex functional system. During the course, students will design a set of building blocks based on individual pieces of knowledge from the all above stated courses allowing at the end to build complex demonstration signal processing and communication systems. The laboratory uses a computer based simulation system platform (e.g. Matlab) to practically verify the system functionality and its performance. It also demonstrates how various CAD and mathematical SW tools can be used in designing the system.			
A8B01CAS	Computer Algebra Systems (CAS)	Z	2
Computer algebra systems (CAS) Matlab, Maple and Mathematica are used to demonstrate basic mathematical concepts that students encounter in subjects Mathematics and Introductory Algebra. Seminars provide both computational and graphical examples with particular emphasis on problems whose solution without CAS is either difficult or impossible.			
B6B32PSI	Computer Networks	Z,ZK	5
A8B37SAS	Signals and Systems	Z,ZK	8
Continuous and discrete time signal representation in time and frequency domain. Stochastic signals and their parameters. Elementary principles of analog modulations with their noise conditions. Fundamental course for further study focusing on communication, measurement and signal processing.			
A8B17EMT	Electromagnetic Field Theory	Z,ZK	8
Students get acquainted with physics fundaments of the electromagnetic theory and with its mathematical description. Particularly, the course guides student through electrostatics, magnetostatics, introduces coupling between time varying fields and it is ends with an introduction to an electromagnetic wave. The knowledge gained in this course are needed for the subsequent course AE8B17ELD (Electrodynamics), for the course of circuit theory, theory of semiconductors and a number of specialized master courses.			
A8B31CIR	Circuit Theory	Z,ZK	8
The subject AE8B31CIR is a complet systematic presentation of electrical circuit theory. It is based on general physical nature of electromagnetic effects, an electric circuit is presented as a special quasistationary case of electromagnetic field. It defines basic circuit quantities (voltage, current) and basic circuit elements modeling all kinds of actual energy interactions. The subject is specifically oriented on linear electrical circuit (analogue LTI systems), it presents basic principles and theorems of circuit theory, and analysis methods of linear circuits working in steady and transient states (modes), respectively. The time domain and frequency domain analysis is strictly differentiated. "System? characterization is applied on circuit transfer properties analysis, stability analysis, and feedback theory. At the end the subject deals with basis of discrete LTI systems theory.			
A8B37SSP	Statistical Signal Processing	Z,ZK	6
The course provides fundamentals in three main domains of the statistical signal processing: 1) estimation theory, 2) detection theory, 3) optimal and adaptive filtering. The statistical signal processing is a core theory with many applications ranging from digital communications, audio and video processing, radar and radio navigation, measurement and experiment evaluation, etc.			
A8B35FCS	Feed-Back Control Systems	Z,ZK	6
Foundation course of automatic control. Introduction to basic concepts and properties of dynamic systems of physical, engineering, biological, economics, robotics and informatics nature. Basic principles of feedback and its use as a tool for altering the behavior of systems and managing uncertainty. Classical and modern methods for analysis and design of automatic control systems. Students specialized in systems and control will build on these ideas and knowledge in the advanced courses to follow. Students of other branches and programs will find out that control is a inspiring, ubiquitous and entertaining field worth of a future cooperation.			
A8B31ELE	Elements of Electronics	KZ	4
The subject AE8B31ELE (B-ELE) is a free continuation of the subject AE8B32IES (B-IES), now with technical contents yet, that provides elementary basis of electrical and electronic engineering, describes and explains common contexts among electrical phenomena, that are important for subsequent specialized subjects (for instance AE8B31CIR (B-CIR), AE8B31DIT (B-DIT), AE8B31EMT (B-EMT), AE8B31SAS (B-SAS)). The subject education uses relatively simple, elementary mathematical and physical methods adequate to the 2nd semester of the bachelor study stage. The subject provides basis of: - electromagnetic field and electrical circuit theory - semiconductor components theory - signal and system theory - digital and microprocessor technique.			
A8B32IES	Introduction to Electronic Systems	Z	2
This is a motivation subject with syllabus composed of a set of demonstrations and measurements. Its content is divided into several themes. Students have a choice from this offer based on their pre-knowledge. The goal is to complete the missing knowledge and skills which may vary in students coming from various schools. The next goal is to get an idea about the scope of the OES programme.			

Name of the block: Elective courses

Minimal number of credits of the block: 8

The role of the block: V

Code of the group: BOESHM

Name of the group: Humanities, economically-management subjects

Requirement credits in the group: In this group you have to gain at least 8 credits (at most 134)

Requirement courses in the group:

Credits in the group: 8

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
BE9M04AKP	<b>Academic Writing</b> Michael Ynsua, Dana Saláková <b>Dana Saláková</b> Dana Saláková (Gar.)	KZ	2	2C	L	v
B3B04PSA	<b>Academic Writing</b> Dana Saláková, Jitka Pinková, Irena Kozmanová, Petra Jirásková, Dana Lisá <b>Markéta Havlíčková</b> Dana Saláková (Gar.)	KZ	2	2C	Z	v
A0B04GA	<b>Petra Jennings</b> Dana Saláková (Gar.)	Z	2	2C	Z,L	v
A0B04KA	<b>English Conversation 2</b> <b>Markéta Havlíčková</b> Dana Saláková (Gar.)	Z	2	2C	Z,L	v
A0B04KA2	<b>English Conversation 2</b> <b>Markéta Havlíčková</b> Dana Saláková (Gar.)	Z	2	2C	Z,L	v
A0B04OA	<b>Technical English Course</b> <b>Markéta Havlíčková</b> Dana Saláková (Gar.)	Z	2	2C	Z,L	v
A0B16EPD	<b>Business economics</b> Oldřich Starý, Jirí Vašíček, Josef Čermohous <b>Oldřich Starý</b> (Gar.)	KZ	4	2+2s	Z,L	v
B0B16ET1	<b>Ethic 1</b> Vladimír Slámečka <b>Vladimír Slámečka</b> Vladimír Slámečka (Gar.)	KZ	4	2P+2C	Z	v
B0B16FIL	<b>Philosophy</b> Peter Zamarovský <b>Josef Černohous</b> Peter Zamarovský (Gar.)	ZK	2	2P+0S	Z,L	v
B0B16FI1	<b>Philosophy 1</b> Peter Zamarovský <b>Peter Zamarovský</b> Peter Zamarovský (Gar.)	KZ	4	2P+2S	Z	v
A0B04KF1	<b>French conversation 1</b> <b>Dana Saláková</b> Dana Saláková (Gar.)	Z	2	2C	*	v
A0B04KF2	<b>French conversation 1</b> <b>Dana Saláková</b> Dana Saláková (Gar.)	Z	2	2C	*	v
A0B04F1	<b>French language 1</b> <b>Markéta Havlíčková</b> Dana Saláková (Gar.)	Z	2	2C	*	v
A0B04F2	<b>French language 2</b> <b>Dana Saláková</b> Dana Saláková (Gar.)	Z	2	2C	*	v
A0B04F3	<b>French Language 3</b> <b>Dana Saláková</b> Dana Saláková (Gar.)	Z	2	2C	*	v
B0B16HI1	<b>History 1</b> Roman Elner, Milena Josefovičová <b>Milena Josefovičová</b> Milena Josefovičová (Gar.)	KZ	4	2P+2S	Z	v
B0B16HTE	<b>History of technology and economic</b> Marcela Efmertová, Jan Mikeš <b>Marcela Efmertová</b> Marcela Efmertová (Gar.)	ZK	2	2P+0S	Z,L	v
B0B16HT1	<b>History of science and technology 1</b> Marcela Efmertová, Jan Mikeš <b>Jan Mikeš</b> Marcela Efmertová (Gar.)	KZ	4	2P+2S	Z	v
A0B04JAP	<b>Japanese</b> <b>Markéta Havlíčková</b> Dana Saláková (Gar.)	Z	2	2C	*	v
A0B04JAP2	<b>Japanese 2</b> <b>Markéta Havlíčková</b> Dana Saláková (Gar.)	Z	2	2C	*	v
A1B16MME	<b>Macro and Microeconomics</b> Alena Ambrožová, Helena Fialová, Miroslav Vítek <b>Alena Ambrožová</b> Alena Ambrožová (Gar.)	Z,ZK	5	2+2s	Z	v
B0B16MPS	<b>Psychology</b> Jan Fiala <b>Jan Fiala</b> Jan Fiala (Gar.)	Z,ZK	4	2P+2S	Z,L	v
A0B04GN	<b>German Grammar</b> <b>Dana Saláková</b> Dana Saláková (Gar.)	Z	2	2C	Z,L	v
A0B04KN	<b>German Conversation</b> <b>Dana Saláková</b> Dana Saláková (Gar.)	Z	2	2C	Z,L	v
A0B04KN2	<b>German conversation 2</b> <b>Dana Saláková</b> Dana Saláková (Gar.)	Z	2	2C	*	v
A0B04N1	<b>German language 1</b> <b>Dana Saláková</b> Dana Saláková (Gar.)	Z	2	2C	*	v
A0B04N2	<b>German language 2</b> <b>Dana Saláková</b> Dana Saláková (Gar.)	Z	2	2C	*	v
A0B04N3	<b>German language 3</b> <b>Dana Saláková</b> Dana Saláková (Gar.)	Z	2	2C	*	v
A0B04ON	<b>Professional German</b> <b>Dana Saláková</b> Dana Saláková (Gar.)	Z	2	2C	Z,L	v
BE9M04PRE	<b>Presentation Skills</b> Michael Ynsua, Dana Saláková, Erik Peter Stadnik <b>Dana Saláková</b> Dana Saláková (Gar.)	KZ	2	2C	Z	v

B6B04PRE	<b>Presentation</b> Dana Saláková, Jitka Pinková, Dana Lisá, Václava Jarská <b>Jitka Pinková</b> Dana Saláková (Gar.)	KZ	3	1P+1C	Z	v
A0B16PRS	<b>Presentation skills</b> Dana Lisá, Václava Jarská, Vladimíra Nováková, František Macholda, Jiří Beranovský Jaroslav Knápek (Gar.)	Z	2	2s	Z,L	v
B0B16MPL	<b>Psychology for managers</b> Jan Fiala <b>Jan Fiala Jan Fiala</b> (Gar.)	ZK	2	2P+0S	Z,L	v
A0B04CAE1	<b>Certificate of Advanced English CAE 1</b> Pavla Péterová Dana Saláková (Gar.)	Z	2	2C	Z,L	v
A0B04CAE2	<b>Certificate of Advanced English CAE 2</b> Pavla Péterová Dana Saláková (Gar.)	Z	2	2C	Z,L	v
A0B04CAE3	<b>Certificate of Advanced English CAE 3</b> Pavla Péterová Dana Saláková (Gar.)	Z	2	2C	Z,L	v
A0B04FCE1	<b>FCE 1</b> Petra Jennings Dana Saláková (Gar.)	Z	2	2C	*	v
A0B04FCE2	<b>FCE 2</b> Pavla Péterová Dana Saláková (Gar.)	Z	2	2C	*	v
A0B04FCE4	<b>FCE4</b> Pavla Péterová	Z	2	2C	Z,L	v
A0B04FCE3	<b>FCE 3</b> Pavla Péterová Dana Saláková (Gar.)	Z	2	2C	Z,L	v
A0B04PZP	<b>Preparation for stay in Germany</b> Dana Lisá	Z	2	2C	*	v
A0B04KR2	<b>Russian conversation 2</b> Dana Saláková Dana Saláková (Gar.)	Z	2	2C	*	v
A0B04R1	<b>Russian language 1</b> Dana Saláková Dana Saláková (Gar.)	Z	2	2C	*	v
A0B04R2	<b>Russian language 2</b> Dana Saláková Dana Saláková (Gar.)	Z	2	2C	*	v
A0B04R3	<b>Russian language 3</b> Dana Saláková Dana Saláková (Gar.)	Z	2	2C	*	v
A0B04R4	<b>Russian language 3</b> Dana Saláková Dana Saláková (Gar.)	Z	2	2C	*	v
A0B04RET	<b>Rhetoric</b> Jitka Pinková Dana Saláková (Gar.)	Z	2	2C	Z,L	v
A0B04CA	<b>Technical English for Pre-Intermediate</b> Markéta Havlíčková	Z	2	2C	L	v
A003TV	<b>Physical Education</b>	Z	2	0+2	L,Z	v
A0B04C2Z	<b>Czech language 2</b> Markéta Havlíčková Dana Saláková (Gar.)	Z	2	2C	Z	v
A0B04C2L	<b>Czech language 2</b> Markéta Havlíčková Dana Saláková (Gar.)	Z	2	2C	L	v
A0B04CIN	<b>Markéta Havlíčková Dana Saláková (Gar.)</b>	Z	2	2C	*	v
A0B04CIN2	<b>Chinese Language 2</b> Markéta Havlíčková Dana Saláková (Gar.)	Z	2	2C	Z,L	v
A0B04KS1	<b>Spanish conversation 1</b> Dana Saláková Dana Saláková (Gar.)	Z	2	2C	*	v
A0B04KS2	<b>Spanish conversation 2</b> Dana Saláková Dana Saláková (Gar.)	Z	2	2C	*	v
A0B04S1	<b>Spanish language 1</b> Dana Saláková Dana Saláková (Gar.)	Z	2	2C	*	v
A0B04S2	<b>Spanish language 2</b> Dana Saláková Dana Saláková (Gar.)	Z	2	2C	*	v
A0B04S3	<b>Spanish language 3</b> Dana Saláková Dana Saláková (Gar.)	Z	2	2C	*	v
A0B04S4	<b>Spanish Language 4</b> Dana Saláková Dana Saláková (Gar.)	Z	2	2C	*	v

**Characteristics of the courses of this group of Study Plan: Code=BOESHM Name=Humanities, economically-management subjects**

BE9M04AKP	Academic Writing	KZ	2
ACADEMIC WRITING COURSE (BE9M04AKP) Objective(s): The overall aim of this course is not to increase the student's level of English, but to improve the student's skills and abilities of writing academically (in English). This course is not simply an opportunity for students who have registered to have someone (the instructor) simply proofread and correct their texts - the ultimate goal of the course will be that the student is able to write (better) in English at an academic level. If a student's level of English is not up to the expected level of this course (B2 Upper-Intermediate), it is the student's responsibility to take action to improve it (outside of this course). It is hoped that by working and writing in English on a regular basis throughout this course that participants will, naturally, improve their level of English in one way or another.			
B3B04PSA	Academic Writing	KZ	2
A0B04GA		Z	2
The aim of this course is to extend and complement grammatical patterns covered in other English courses that are intended for full-time students. The course is meant mainly as a supplement for students who have not yet passed the B2 examination and are interested in further study and additional practice.			
A0B04KA	English Conversation 2	Z	2
The course is designed for students who want to develop their communication skills. Students will be given the opportunity to use the vocabulary they already know, as well as learn new words and phrases, to communicate on a variety of topics and themes. This course is not designed for beginners.			

A0B04KA2	English Conversation 2	Z	2
The course is designed for students who want to develop their communication skills. Students will be given the opportunity to use the vocabulary they already know, as well as learn new words and phrases, to communicate on a variety of topics and themes. The course is generally designed as a follow-up to the Conversation One course, building on the skills presented there; however, attending Conversation One is not a pre-requisite. This course is not designed for beginners.			
A0B04OA	Technical English Course	Z	2
The course is designed for students who have completed the B2 English course. Its main objective is to prepare students for the study of selected specialized courses in English by covering a broader range of topics in engineering. In addition to teaching materials aimed at expanding technical vocabulary and consolidating current language skills, the focus is on authentic articles adapted from professional journals and accompanying videos. The syllabus also leaves space for students' presentations covering various fields of science.			
A0B16EPD	Business economics	KZ	4
Basic course of Business Economics deals with the subject from wide angle of view, discussing all particular aspects of Business Economics, and relationships between them.			
B0B16ET1	Ethic 1	KZ	4
Aim of this subject is to provide the students an orientation not only in general problems of ethics but above all to offer instructions for solving various situations of human life. Essential parts of the subject are discussions in which students can react to lectures but also to actual questions coming with news and look for the communal answers.			
B0B16FIL	Philosophy	ZK	2
We deal with the most important persons, schools and ideas of ancient philosophy. We are concerned especially on transdisciplinary nature of philosophy and connection of old philosophical thoughts with recent problems of science, technology, economics and politics.			
B0B16F11	Philosophy 1	KZ	4
We deal with the most important persons, schools and ideas of ancient philosophy. We are concerned especially on transdisciplinary nature of philosophy and connection of old philosophical thoughts with recent problems of science, technology, economics and politics.			
A0B04KF1	French conversation 1	Z	2
A0B04KF2	French conversation 1	Z	2
A0B04F1	French language 1	Z	2
A0B04F2	French language 2	Z	2
A0B04F3	French Language 3	Z	2
B0B16HI1	History 1	KZ	4
B0B16HTE	History of technology and economic	ZK	2
B0B16HT1	History of science and technology 1	KZ	4
A0B04JAP	Japanese	Z	2
A0B04JAP2	Japanese 2	Z	2
A1B16MME	Macro and Microeconomics	Z,ZK	5
Basic economic terms, market, law of demand, law of supply, market equilibrium, price regulation, price and income elasticities, consumer's behavior, producer's behavior, cost, revenue, profit, market failure, monopoly, government macroeconomic policy, gross domestic product, multipliers, money, inflation, banking system, monetary policy, labor market, business cycle, fiscal policy, foreign trade policy, comparative advantage, CR and EU, Euro.			
B0B16MPS	Psychology	Z,ZK	4
A0B04GN	German Grammar	Z	2
A0B04KN	German Conversation	Z	2
A0B04KN2	German conversation 2	Z	2
A0B04N1	German language 1	Z	2
A0B04N2	German language 2	Z	2
A0B04N3	German language 3	Z	2
A0B04ON	Professional German	Z	2
BE9M04PRE	Presentation Skills	KZ	2
The overall aim of this course is to develop communication and language skills in order to plan and deliver an effective presentation. Students will be taken systematically through the key stages of giving presentations, from planning and introducing to concluding. Students are guided, using interactive methods, to communicate their thoughts and ideas in a logical and structured order - and in as brief or succinct a way as possible. Emphasis is placed on independent, critical thinking and the correct formulation of presenting ideas; throughout this course students will practice skills that will enable them to become better speakers and presenters.			
B6B04PRE	Presentation	KZ	3
A0B16PRS	Presentation skills	Z	2
Students will learn to prepare and to do presentation. They will obtain skills how to prepare written documents using typographic principles and proper way of citation and referencing. They will prove gained theoretical knowledge on self prepared interactive presentation that is recorded on video and discussed.			
B0B16MPL	Psychology for managers	ZK	2
A0B04CAE1	Certificate of Advanced English CAE 1	Z	2
The aim of the course is to prepare for Certificate of Advanced English - the second highest level Cambridge ESOL exam. The course CAE1 covers units 1-4. Studying for CAE helps you to improve your language skills (reading, writing, English in use, listening and speaking) and use them in a wide range of contexts. The exam is based on realistic tasks and indicates the ability to use the language in practical situations. You will be able to participate in meetings and discussions, expressing opinions clearly and be able to understand and produce texts of various types. CAE is recognised by the majority of universities in English speaking countries as proof of adequate language skills for courses taught and assessed in English as well as by employers who require knowledge of a foreign language. CAE is taken by more than 60 000 people each year in more than 60 countries. It is possible but not necessary for obtaining credit to take CAE at British Council.			
A0B04CAE2	Certificate of Advanced English CAE 2	Z	2
The aim of the course is to prepare for Certificate of Advanced English - the second highest level Cambridge ESOL exam. The course CAE2 covers units 5-8. Studying for CAE helps you to improve your language skills (reading, writing, English in use, listening and speaking) and use them in a wide range of contexts. The exam is based on realistic tasks and indicates the ability to use the language in practical situations. You will be able to participate in meetings and discussions, expressing opinions clearly and be able to understand and produce texts of various types. CAE is recognised by the majority of universities in English speaking countries as proof of adequate language skills for courses taught and assessed in English as well as by employers who require knowledge of a foreign language. CAE is taken by more than 60 000 people each year in more than 60 countries. It is possible but not necessary for obtaining credit to take CAE at British Council. Student is allowed to enrol only into one CAE course during one semester.			
A0B04CAE3	Certificate of Advanced English CAE 3	Z	2
The aim of the course is to prepare for Certificate of Advanced English - the second highest level Cambridge ESOL exam. The course CAE3 covers unit 9 - 12. Studying for CAE helps you to improve your language skills (reading, writing English in use, listening and speaking) and use them in a wide range of contexts.			



A0B04FCE1	FCE 1	Z	2
The course is aimed for students, employees of the Faculty and the public whose knowledge of English corresponds to B1 level according to the European Language Frame. The course focuses on improving all language skills - writing, speaking, reading, listening, grammar and phonetics - and is submitted to the goal of obtaining the required skills needed for B2 ELF.			
A0B04FCE2	FCE 2	Z	2
The course is aimed for students, employees of the Faculty and the public whose knowledge of English corresponds to B1 level according to the European Language Frame. The course focuses on improving all language skills - writing, speaking, reading, listening, grammar and phonetics - and is submitted to the goal of obtaining the required skills needed for B2 ELF.			
A0B04FCE4	FCE4	Z	2
The course is aimed for students, employees of the Faculty and the public whose knowledge of English corresponds to B1 level according to the European Language Frame. The course focuses on improving all language skills - writing, speaking, reading, listening, grammar and phonetics - and is submitted to the goal of obtaining the required skills needed for B2 ELF.			
A0B04FCE3	FCE 3	Z	2
The course is aimed for students, employees of the Faculty and the public whose knowledge of English corresponds to B1 level according to the Common European Framework of Reference for Languages (CEFR). The course focuses on improving all language skills - writing, speaking, reading, listening, grammar and phonetics - and is submitted to the goal of obtaining the required skills needed for B2 CEFR.			
A0B04PZP	Preparation for stay in Germany	Z	2
A0B04KR2	Russian conversation 2	Z	2
A0B04R1	Russian language 1	Z	2
A0B04R2	Russian language 2	Z	2
A0B04R3	Russian language 3	Z	2
A0B04R4	Russian language 3	Z	2
A0B04RET	Rhetoric	Z	2
The objective of the subject is to master and improve skills necessary for successful presentation as well as enhancing the communicative ability of the prospective engineers and bachelors. This subject will enable the students to develop both spoken and written presentations, non verbal communication and remove the psychological barriers for public speaking so that the students can create a good image. The course "Retorika" provides an introduction to this subject.			
A0B04CA	Technical English for Pre-Intermediate	Z	2
A003TV	Physical Education	Z	2
A0B04C2Z	Czech language 2	Z	2
The course is aimed at foreign students studying in Czech, it further develops their language knowledge and skills to meet the needs of technical university students			
A0B04C2L	Czech language 2	Z	2
The course is aimed at foreign students studying in Czech, it further develops their language knowledge and skills to meet the needs of technical university students.			
A0B04CIN		Z	2
A0B04CIN2	Chinese Language 2	Z	2
A0B04KS1	Spanish conversation 1	Z	2
A0B04KS2	Spanish conversation 2	Z	2
A0B04S1	Spanish language 1	Z	2
A0B04S2	Spanish language 2	Z	2
A0B04S3	Spanish language 3	Z	2
A0B04S4	Spanish Language 4	Z	2

Code of the group: BTV

Name of the group: Tělesná výchova

Requirement credits in the group:

Requirement courses in the group:

Credits in the group: 0

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
TVV	Physical education	Z	0	0+2	Z,L	v
A003TV	Physical Education	Z	2	0+2	L,Z	v
TVV0	Physical education	Z	0	0+2	Z,L	v
TV-V1	Physical education	Z	1	0+2	Z,L	v

Characteristics of the courses of this group of Study Plan: Code=BTV Name=Tělesná výchova

A003TV	Physical Education	Z	2
TVV	Physical education	Z	0
TVV0	Physical education	Z	0
TV-V1	Physical education	Z	1

Code of the group: BTVK

Name of the group: Tělovýchovné kurzy

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
TVKLV	Physical Education Course	Z	0	7dní	L	v
TVKZV	Physical Education Course	Z	0	7dní	Z	v

Characteristics of the courses of this group of Study Plan: Code=BTVK Name=Tělovýchovné kurzy

TVKLV	Physical Education Course	Z	0
TVKZV	Physical Education Course	Z	0

Code of the group: BOESVOL

Name of the group: Elective subjects

Requirement credits in the group:

Requirement courses in the group:

Credits in the group: 0

Note on the group:

~Nabídku volitelných předmětů uspořádaných podle kateder najdete na webových stránkách  
<http://www.fel.cvut.cz/cz/education/volitelne-predmety.html>

### List of courses of this pass:

Code	Name of the course	Completion	Credits
A003TV	Physical Education	Z	2
A0B04B2Z	English language B2-exam	Z,ZK	0
A0B04C2L	Czech language 2 The course is aimed at foreign students studying in Czech, it further develops their language knowledge and skills to meet the needs of technical university students.	Z	2
A0B04C2Z	Czech language 2 The course is aimed at foreign students studying in Czech, it further develops their language knowledge and skills to meet the needs of technical university students	Z	2
A0B04CA	Technical English for Pre-Intermediate	Z	2
A0B04CAE1	Certificate of Advanced English CAE 1 The aim of the course is to prepare for Certificate of Advanced English - the second highest level Cambridge ESOL exam. The course CAE1 covers units 1-4. Studying for CAE helps you to improve your language skills (reading, writing, English in use, listening and speaking) and use them in a wide range of contexts. The exam is based on realistic tasks and indicates the ability to use the language in practical situations. You will be able to participate in meetings and discussions, expressing opinions clearly and be able to understand and produce texts of various types. CAE is recognised by the majority of universities in English speaking countries as proof of adequate language skills for courses taught and assessed in English as well as by employers who require knowledge of a foreign language. CAE is taken by more than 60 000 people each year in more than 60 countries. It is possible but not necessary for obtaining credit to take CAE at British Council.	Z	2
A0B04CAE2	Certificate of Advanced English CAE 2 The aim of the course is to prepare for Certificate of Advanced English - the second highest level Cambridge ESOL exam. The course CAE2 covers units 5-8. Studying for CAE helps you to improve your language skills (reading, writing, English in use, listening and speaking) and use them in a wide range of contexts. The exam is based on realistic tasks and indicates the ability to use the language in practical situations. You will be able to participate in meetings and discussions, expressing opinions clearly and be able to understand and produce texts of various types. CAE is recognised by the majority of universities in English speaking countries as proof of adequate language skills for courses taught and assessed in English as well as by employers who require knowledge of a foreign language. CAE is taken by more than 60 000 people each year in more than 60 countries. It is possible but not necessary for obtaining credit to take CAE at British Council. Student is allowed to enrol only into one CAE course during one semester.	Z	2
A0B04CAE3	Certificate of Advanced English CAE 3 The aim of the course is to prepare for Certificate of Advanced English - the second highest level Cambridge ESOL exam. The course CAE3 covers unit 9 - 12. Studying for CAE helps you to improve your language skills (reading, writing English in use, listening and speaking) and use them in a wide range of contexts.	Z	2
A0B04CIN		Z	2
A0B04CIN2	Chinese Language 2	Z	2
A0B04F1	French language 1	Z	2
A0B04F2	French language 2	Z	2
A0B04F3	French Language 3	Z	2
A0B04FCE1	FCE 1 The course is aimed for students, employees of the Faculty and the public whose knowledge of English corresponds to B1 level according to the European Language Frame. The course focuses on improving all language skills - writing, speaking, reading, listening, grammar and phonetics - and is submitted to the goal of obtaining the required skills needed for B2 ELF.	Z	2

A0B04FCE2	FCE 2	Z	2
The course is aimed for students, employees of the Faculty and the public whose knowledge of English corresponds to B1 level according to the European Language Frame. The course focuses on improving all language skills - writing, speaking, reading, listening, grammar and phonetics - and is submitted to the goal of obtaining the required skills needed for B2 ELF.			
A0B04FCE3	FCE 3	Z	2
The course is aimed for students, employees of the Faculty and the public whose knowledge of English corresponds to B1 level according to the Common European Framework of Reference for Languages (CEFR). The course focuses on improving all language skills - writing, speaking, reading, listening, grammar and phonetics - and is submitted to the goal of obtaining the required skills needed for B2 CEFR.			
A0B04FCE4	FCE4	Z	2
The course is aimed for students, employees of the Faculty and the public whose knowledge of English corresponds to B1 level according to the European Language Frame. The course focuses on improving all language skills - writing, speaking, reading, listening, grammar and phonetics - and is submitted to the goal of obtaining the required skills needed for B2 ELF.			
A0B04GA		Z	2
The aim of this course is to extend and complement grammatical patterns covered in other English courses that are intended for full-time students. The course is meant mainly as a supplement for students who have not yet passed the B2 examination and are interested in further study and additional practice.			
A0B04GN	German Grammar	Z	2
A0B04JAP	Japanese	Z	2
A0B04JAP2	Japanese 2	Z	2
A0B04KA	English Conversation 2	Z	2
The course is designed for students who want to develop their communication skills. Students will be given the opportunity to use the vocabulary they already know, as well as learn new words and phrases, to communicate on a variety of topics and themes. This course is not designed for beginners.			
A0B04KA2	English Conversation 2	Z	2
The course is designed for students who want to develop their communication skills. Students will be given the opportunity to use the vocabulary they already know, as well as learn new words and phrases, to communicate on a variety of topics and themes. The course is generally designed as a follow-up to the Conversation One course, building on the skills presented there; however, attending Conversation One is not a pre-requisite. This course is not designed for beginners.			
A0B04KF1	French conversation 1	Z	2
A0B04KF2	French conversation 1	Z	2
A0B04KN	German Conversation	Z	2
A0B04KN2	German conversation 2	Z	2
A0B04KR2	Russian conversation 2	Z	2
A0B04KS1	Spanish conversation 1	Z	2
A0B04KS2	Spanish conversation 2	Z	2
A0B04N1	German language 1	Z	2
A0B04N2	German language 2	Z	2
A0B04N3	German language 3	Z	2
A0B04OA	Technical English Course	Z	2
The course is designed for students who have completed the B2 English course. Its main objective is to prepare students for the study of selected specialized courses in English by covering a broader range of topics in engineering. In addition to teaching materials aimed at expanding technical vocabulary and consolidating current language skills, the focus is on authentic articles adapted from professional journals and accompanying videos. The syllabus also leaves space for students' presentations covering various fields of science.			
A0B04ON	Professional German	Z	2
A0B04PZP	Preparation for stay in Germany	Z	2
A0B04R1	Russian language 1	Z	2
A0B04R2	Russian language 2	Z	2
A0B04R3	Russian language 3	Z	2
A0B04R4	Russian language 3	Z	2
A0B04RET	Rhetoric	Z	2
The objective of the subject is to master and improve skills necessary for successful presentation as well as enhancing the communicative ability of the prospective engineers and bachelors. This subject will enable the students to develop both spoken and written presentations, non verbal communication and remove the psychological barriers for public speaking so that the students can create a good image. The course "Retorika" provides an introduction to this subject.			
A0B04S1	Spanish language 1	Z	2
A0B04S2	Spanish language 2	Z	2
A0B04S3	Spanish language 3	Z	2
A0B04S4	Spanish Language 4	Z	2
A0B16EPD	Business economics	KZ	4
Basic course of Business Economics deals with the subject from wide angle of view, discussing all particular aspects of Business Economics, and relationships between them.			
A0B16PRS	Presentation skills	Z	2
Students will learn to prepare and to do presentation. They will obtain skills how to prepare written documents using typographic principles and proper way of citation and referencing. They will prove gained theoretical knowledge on self prepared interactive presentation that is recorded on video and discussed.			
A1B16MME	Macro and Microeconomics	Z,ZK	5
Basic economic terms, market, law of demand, law of supply, market equilibrium, price regulation, price and income elasticities, consumer's behavior, producer's behavior, cost, revenue, profit, market failure, monopoly, government macroeconomic policy, gross domestic product, multipliers, money, inflation, banking system, monetary policy, labor market, business cycle, fiscal policy, foreign trade policy, comparative advantage, CR and EU, Euro.			
A8B01AMA	Advanced Matrix Analysis	Z,ZK	4
This is a continuation of linear algebra. A relatively good knowledge of basic notions of linear algebra is supposed. The aim is to explain spectral theorems and their applications. Further Jordan form of a matrix and functions of a matrix are studied.			
A8B01BAP	Bachelor thesis	Z	9

A8B01CAS	Computer Algebra Systems (CAS)	Z	2
Computer algebra systems (CAS) Matlab, Maple and Mathematica are used to demonstrate basic mathematical concepts that students encounter in subjects Mathematics and Introductory Algebra. Seminars provide both computational and graphical examples with particular emphasis on problems whose solution without CAS is either difficult or impossible.			
A8B01DEN	Differential Equations&Numerical Methods	Z,ZK	7
This course offers an introduction to differential equations and numerical methods. We survey major types of ordinary differential equations and introduces partial differential equations. For common problems (roots, systems of linear equations, ODE?s) we will show basic approaches for solving them numerically.			
A8B01DMG	Discrete Math.& Graphs	Z,ZK	5
The course introduces basic notions from discrete mathematics directed to those topics useful for electrical engineering studies. The content of the course covers: infinite sets with emphasis to cardinality of sets, binary relations with emphasis to equivalence relations and partial orders; integers, relation modulo n; basic algebraic structures (including finite fields of characteristic 2). Further the course contains basic notions and their applications from graph theory.			
A8B01LAG	Linear Algebra	Z,ZK	7
This course covers introductory topics of linear algebra. The main focus is on the related notions of linear spaces and linear transformations (linear independence, bases and coordinates) and matrices (determinants, inverse matrix, matrix of a linear mapping, eigenvalues). Applications include solving systems of linear equations, geometry in 3-space (including dot product and cross product), and solving linear differential equations.			
A8B01MC1	Mathematics-Calculus1	Z,ZK	7
The aim of the course is to introduce students to basics of differential and integral calculus of functions of one variable.			
A8B01MCM	Mathematics-Calculus m-D	Z,ZK	7
The subject covers an introduction to the differential and integral calculus in several variables and basic relations between curve and surface integrals. Other part contains function series and power series with application to Taylor and Fourier series.			
A8B01MCT	Mathematics-Complex Variable and Integral Transforms	Z,ZK	7
A8B01OGT	Optimization and Game Theory	Z,ZK	4
A8B01PSI	Probability, Statistics and Information Theory	Z,ZK	6
Basics of probability theory, mathematical statistics, information theory, and coding. Includes descriptions of probability, random variables and their distributions, characteristics and operations with random variables. Basics of mathematical statistics: Point and interval estimates, methods of parameters estimation and hypotheses testing, least squares method. Basic notions and results of the theory of Markov chains. Shannon entropy, mutual and conditional information.			
A8B02BAP	Bachelor thesis	Z	9
Independent final project for the Bachelor's degree study programme. A student will choose a topic from a range of topics related to his or her branch of study, which will be specified by branch department or branch departments. The Bachelor's project will be defended in front of the board of examiners for the comprehensive final examination.			
A8B02PH1	Physics 1	Z,ZK	7
The basic course of physics at the Faculty of Electrical Engineering - Physics 1, is devoted to the introduction into two important areas of physics. The first one is a classical mechanics and the second one is the electric and magnetic field. Within the framework of the classical mechanics, the students study the particle kinematics; dynamics of the mass particle, system of mass particles and rigid bodies. The students should be able to solve basic problems dealing with the description of mechanical systems, which they can meet during their further studies. The classical mechanics is followed by the relativistic mechanics, electric and magnetic field - both stationary as well as non-stationary. The students can use the facts gained in this course in the study of electrical circuits, theory of electrotechnical materials or radioelectronics. Apart of this, the knowledge gained in this course is required for the study of the consecutive course Physics 2.			
A8B02PH2	Physics 2	Z,ZK	7
The course Physics 2 is closely linked with the course Physics 1. Within the framework of this course the students will first of all learn foundations of phenomenological and statistical thermodynamics. Following topic - the theory of waves - will give to the students basic insight into the properties of waves and will help to the students to understand that the presented description of the waves has a universal character in spite of the waves character. Particular types of waves, such as acoustic or electromagnetic waves are the subjects of the following section. Quantum mechanics physics will complete the student's general education in physics. The knowledge gained in this course will help to the students in study of modern technical areas encountered during their studies and will allow them to understand the principles of novel technologies and functioning of new electronic devices.			
A8B14ADP	Algorithm Development and Programming	Z,ZK	5
Course objective: Introduction to algorithm design of basic and more advanced computer tasks, Digital computer structure, Introduction to the C programming language, Syntax and semantics. Basic skills of procedural programming paradigm, variable, data type, declaration, operators, expressions, statements, functions, parameter passing, arrays, pointers, structures, compilation and debugging methods, preprocessor, conditional compilation, standard libraries, specific of embedded computer systems programming and debugging.			
A8B14BAP	Bachelor thesis	Z	9
A8B15BAP	Bachelor thesis	Z	9
A8B16BAP	Bachelor thesis	Z	9
A8B17BAP	Bachelor thesis	Z	9
Independent final project for the Bachelor's degree study programme. A student will choose a topic from a range of topics related to his or her branch of study, which will be specified by branch department or branch departments. The Bachelor's project will be defended in front of the board of examiners for the comprehensive final examination. Bachelor, s projects are oriented into microwave technique, antennas, propagation, optoelectronics, EMC, medical applications.			
A8B17ELD	Electrodynamics	Z,ZK	5
The course AEB17ELD (electrodynamics) is a follow up of the course AEB17EMT (Electromagnetic field theory). The course starts with a decomposition of electromagnetic field into planewaves, introduces radiation of waves and guides student through the interaction of electromagnetic waves with material boundaries. The theory of wave guides and transmission lines is also shown. The course ends with wave scattering. The knowledge gained in this course is needed for number of specialized master courses.			
A8B17EMT	Electromagnetic Field Theory	Z,ZK	8
Students get acquainted with physics fundamentals of the electromagnetic theory and with its mathematical description. Particularly, the course guides student through electrostatics, magnetostatics, introduces coupling between time varying fields and it is ends with an introduction to an electromagnetic wave. The knowledge gained in this course are needed for the subsequent course AE8B17ELD (Electrodynamics), for the course of circuit theory, theory of semiconductors and a number of specialized master courses.			
A8B31AAC	Analog and Active Circuits	Z,ZK	6
The subject AE8B31AAC is oriented on presentation, mathematical description, analysis and synthesis of basic analogue active circuits and function blocks of electronic systems based on basic semiconductor electronic components operating in linear and non-linear modes.			
A8B31BAP	Bachelor thesis	Z	9
A8B31CIR	Circuit Theory	Z,ZK	8
The subject AE8B31CIR is a complete systematic presentation of electrical circuit theory. It is based on general physical nature of electromagnetic effects, an electric circuit is presented as a special quasistationary case of electromagnetic field. It defines basic circuit quantities (voltage, current) and basic circuit elements modeling all kinds of actual energy interactions. The subject is specifically oriented on linear electrical circuit (analogue LTI systems), it presents basic principles and theorems of circuit theory, and analysis methods of linear circuits working in steady and transient states (modes), respectively. The time domain and frequency domain analysis is strictly differentiated. "System" characterization is applied on circuit transfer properties analysis, stability analysis, and feedback theory. At the end the subject deals with basis of discrete LTI systems theory.			

A8B31ELE	Elements of Electronics	KZ	4
The subject AE8B31ELE (B-ELE) is a free continuation of the subject AE8B32IES (B-IES), now with technical contents yet, that provides elementary basis of electrical and electronic engineering, describes and explains common contexts among electrical phenomena, that are important for subsequent specialized subjects (for instance AE8B31CIR (B-CIR), AE8B31DIT (B-DIT), AE8B31EMT (B-EMT), AE8B31SAS (B-SAS)). The subject education uses relatively simple, elementary mathematical and physical methods adequate to the 2nd semester of the bachelor study stage. The subject provides basis of: - electromagnetic field and electrical circuit theory - semiconductor components theory - signal and system theory - digital and microprocessor technique.			
A8B32BAP	Bachelor thesis	Z	9
Independent final project for the Bachelor's degree study programme. A student will choose a topic from a range of topics related to his or her branch of study, which will be specified by branch department or branch departments. The Bachelor's project will be defended in front of the board of examiners for the comprehensive final examination.			
A8B32DCL	Digital Signal Processing and Communication Laboratory	Z	2
This is a shared practical laboratory jointly practicing theoretical foundations gained in Digital Signal Processing (B-DSP), Digital Communications (B-DCM) and Data Network Theory (B-DNT) courses. It demonstrates how these areas together allow designing a complex functional system. During the course, students will design a set of building blocks based on individual pieces of knowledge from the all above stated courses allowing at the end to build complex demonstration signal processing and communication systems. The laboratory uses a computer based simulation system platform (e.g. Matlab) to practically verify the system functionality and its performance. It also demonstrates how various CAD and mathematical SW tools can be used in designing the system.			
A8B32DSP	Digital Signal Processing	Z,ZK	5
This subject is focused upon basics in the digital signal processing, systems and methods for digital signal processing.			
A8B32IES	Introduction to Electronic Systems	Z	2
This is a motivation subject with syllabus composed of a set of demonstrations and measurements. Its content is divided into several themes. Students have a choice from this offer based on their pre-knowledge. The goal is to complete the missing knowledge and skills which may vary in students coming from various schools. The next goal is to get an idea about the scope of the OES programme.			
A8B33BAP	Bachelor thesis	Z	9
A8B34BAP	Bachelor thesis	Z	9
Independent final project for the Bachelor's degree study programme. A student will choose a topic from a range of topics related to his or her branch of study, which will be specified by branch department or branch departments. The Bachelor's project will be defended in front of the board of examiners for the comprehensive final examination.			
A8B34EOD	Electronic and Optoelectronic Devices	Z,ZK	6
This course introduces the basic theory, principles of operation and properties of electronic and optoelectronic devices. Physical principles of operation, device structures and characteristics are explained together with adequate models for small- and large-signal. Basic applications in analogue and digital electronics are examined. In seminars and labs, students are introduced to basic principles of device simulation, measurement of device characteristics and extraction of device parameters. Operation of electron devices in electronic systems is then analyzed using the PSpice simulator.			
A8B34SST	Solid State Physics	Z,ZK	4
The subject is aimed on solid state physics including some parts of statistical physics. The subject informs about basic properties of materials used in electronics, esp. about semiconductors.			
A8B35BAP	Bachelor thesis	Z	9
A8B35FCS	Feed-Back Control Systems	Z,ZK	6
Foundation course of automatic control. Introduction to basic concepts and properties of dynamic systems of physical, engineering, biological, economics, robotics and informatics nature. Basic principles of feedback and its use as a tool for altering the behavior of systems and managing uncertainty. Classical and modern methods for analysis and design of automatic control systems. Students specialized in systems and control will build on these ideas and knowledge in the advanced courses to follow. Students of other branches and programs will find out that control is a inspiring, ubiquitous and entertaining field worth of a future cooperation.			
A8B36BAP	Bachelor thesis	Z	9
Independent final project for the Bachelor's degree study program. Student will choose a topic from a range of topics related to his or her branch of study that will be specified by branch department or branch departments. The Bachelor's project will be defended in front of the board of examiners for the comprehensive final examination.			
A8B37BAP	Bachelor thesis	Z	9
Independent final project for the Bachelor's degree study programme. A student will choose a topic from a range of topics related to his or her branch of study, which will be specified by branch department or branch departments. The Bachelor's project will be defended in front of the board of examiners for the comprehensive final examination.			
A8B37DCM	Digital Communications	Z,ZK	5
The course provides fundamentals of digital communications theory: modulation, classical coding, channel models, and basic principles of decoding. The exposition is systematically built along the theoretical lines which allow to reveal all inner connections and principles. This allows students to develop the knowledge and use it in an active way in a design and construction of the communication systems. The course provides a necessary fundamental background for subsequent more advanced communications theory courses.			
A8B37DIT	Digital Design	Z,ZK	5
The goal of this course is to introduce the philosophy of digital circuits' design, to provide formal description of combinational and sequential logical circuits, their functional blocks. Both mathematical and functional description, as well as minimization algorithms for output and transient functions of digital components and circuits is presented. Karnaugh maps, latch elements, finite-state Mealy and Moore machines are the essential part of the content. The subject matter discussed will be tested on the typical design of digital circuits.			
A8B37SAS	Signals and Systems	Z,ZK	8
Continuous and discrete time signal representation in time and frequency domain. Stochastic signals and their parameters. Elementary principles of analog modulations with their noise conditions. Fundamental course for further study focusing on communication, measurement and signal processing.			
A8B37SSP	Statistical Signal Processing	Z,ZK	6
The course provides fundamentals in three main domains of the statistical signal processing: 1) estimation theory, 2) detection theory, 3) optimal and adaptive filtering. The statistical signal processing is a core theory with many applications ranging from digital communications, audio and video processing, radar and radio navigation, measurement and experiment evaluation, etc.			
A8B38BAP	Bachelor thesis	Z	9
Independent final project for the Bachelor's degree study program. A student will choose a topic from a range of topics related to his or her branch of study, which will be specified by branch department or branch departments. The Bachelor's project will be defended in front of the board of examiners for the comprehensive final examination.			
A8B38EME	Electronic Measurements	KZ	4
The course is focused to metrology fundamentals and uncertainty apparatus. It explains both elementary principles and selected advanced methods used in electronics, telecommunications and radio communications.			
A8B39BAP	Bachelor thesis	Z	9
ABAP9	Bachelor thesis	Z	9
B0B16ET1	Ethic 1	KZ	4
Aim of this subject is to provide the students an orientation not only in general problems of ethics but above all to offer instructions for solving various situations of human life. Essential parts of the subject are discussions in which students can react to lectures but also to actual questions coming with news and look for the communal answers.			

B0B16FI1	Philosophy 1 We deal with the most important persons, schools and ideas of ancient philosophy. We are concerned especially on transdisciplinary nature of philosophy and connection of old philosophical thoughts with recent problems of science, technology, economics and politics.	KZ	4
B0B16FIL	Philosophy We deal with the most important persons, schools and ideas of ancient philosophy. We are concerned especially on transdisciplinary nature of philosophy and connection of old philosophical thoughts with recent problems of science, technology, economics and politics.	ZK	2
B0B16HI1	History 1	KZ	4
B0B16HT1	History of science and technology 1	KZ	4
B0B16HTE	History of technology and economic	ZK	2
B0B16MPL	Psychology for managers	ZK	2
B0B16MPS	Psychology	Z,ZK	4
B3B04PSA	Academic Writing	KZ	2
B6B04PRE	Presentation	KZ	3
B6B32PSI	Computer Networks	Z,ZK	5
BE9M04AKP	Academic Writing ACADEMIC WRITING COURSE (BE9M04AKP) Objective(s): The overall aim of this course is not to increase the student's level of English, but to improve the student's skills and abilities of writing academically (in English). This course is not simply an opportunity for students who have registered to have someone (the instructor) simply proofread and correct their texts - the ultimate goal of the course will be that the student is able to write (better) in English at an academic level. If a student's level of English is not up to the expected level of this course (B2 Upper-Intermediate), it is the student's responsibility to take action to improve it (outside of this course). It is hoped that by working and writing in English on a regular basis throughout this course that participants will, naturally, improve their level of English in one way or another.	KZ	2
BE9M04PRE	Presentation Skills The overall aim of this course is to develop communication and language skills in order to plan and deliver an effective presentation. Students will be taken systematically through the key stages of giving presentations, from planning and introducing to concluding. Students are guided, using interactive methods, to communicate their thoughts and ideas in a logical and structured order - and in as brief or succinct a way as possible. Emphasis is placed on independent, critical thinking and the correct formulation of presenting ideas; throughout this course students will practice skills that will enable them to become better speakers and presenters.	KZ	2
BEZB	Safety in Electrical Engineering for a bachelor's degree The purpose of the safety course is to give the students basic knowledge of electrical equipment and installation as to avoid danger arising from operation of it. This introductory course contains fundamentals of Safety Electrical Engineering. In this way the students receive qualification of instructed person that enables them to work on electrical equipment.	Z	0
BEZZ	Basic health and occupational safety regulations The guidelines were worked out based on The Training Scheme for Health and Occupational Safety designed for employees and students of the Czech Technical University in Prague, which was provided by the Rector's Office of the CTU. Safety is considered one of the basic duties of all employees and students. The knowledge of Health and Occupational Safety regulations forms an integral and permanent part of qualification requirements. This program is obligatory.	Z	0
TV-V1	Physical education	Z	1
TVKLV	Physical Education Course	Z	0
TVKZV	Physical Education Course	Z	0
TVV	Physical education	Z	0
TVV0	Physical education	Z	0

For updated information see <http://bilakniha.cvut.cz/en/f3.html>

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