Recomended pass through the study plan

Name of the pass: Electrical Engineering, Electronics and Communication - Passage through study

Faculty/Institute/Others: Faculty of Electrical Engineering
Department:
Pass through the study plan: Electrical Enginnering, Electronics and Communications
Branch of study guranteed by the department: Common courses
Guarantor of the study branch:
Program of study: Electrical Engineering, Electronics and Communications
Type of study: Bachelor combined
Note on the pass:

Coding of roles of courses and groups of courses:
P - compulsory courses of the program, PO - compulsory courses of the branch, Z - compulsory courses, S - compulsory elective courses, PV - compulsory elective courses, F - elective specialized courses, V - elective courses, T - physical training courses

Coding of ways of completion of courses (KZ/Z/ZK) and coding of semesters (Z/L):
KZ - graded assesment, Z - assesment, ZK - examination, L - summer semester, Z - winter semester

Number of semester: 1

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	**Safety in Electrical Engineering for a bachelor´s degree** *Ivana Nová, Radek Havlíček, Vladimír Kůla **Radek Havlíček** Vladimír Kůla (Gar.)*	Z	0	2BP+2BC	Z,L	P
BD5B01LAG	**Linear Algebra** *Alena Gollová **Alena Gollová** Jiří Velebil (Gar.)*	Z,ZK	8	28KP+6KC	Z	P
BD5B16MME	**Macro and Microekonomics** *Helena Fialová*	Z,ZK	4	14KP+6KS	Z	P
BD5B01MA1	**Mathematical Analysis 1** *Paola Vivi, Jan Hamhalter, Hana Turčinová **Josef Tkadlec** Josef Tkadlec (Gar.)*	Z,ZK	8	28KP+6KC	Z,L	P
BD5B36PRP	**Procedural Programming** *Ivan Jelínek **Ivan Jelínek** Ivan Jelínek (Gar.)*	Z,ZK	6	14KP+6KC	Z	P
BEZZ	**Basic health and occupational safety regulations** *Ivana Nová, Radek Havlíček, Vladimír Kůla **Radek Havlíček** Vladimír Kůla (Gar.)*	Z	0	2BP+2BC	Z	P
BD5B14ZEL	**Fundamentals of Electrotechnical Engineering** *Ivana Nová **Ivana Nová***	KZ	4	14KP+6KC	Z	P

Number of semester: 2

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
BD5B01DRN	**Differencial Equations and Numerical Analysis** *Petr Habala **Petr Habala** Petr Habala (Gar.)*	Z,ZK	6	14KP+6KC	L	P
BD5B31EO1	**Electronic Circuits 1** *Roman Čmejla **Roman Čmejla** Roman Čmejla (Gar.)*	Z,ZK	5	14KP+6KC	L	P
BD5B34EPS	**Electronics** *Lubor Jirásek **Lubor Jirásek** Lubor Jirásek (Gar.)*	KZ	4	14KP+6KL	L	P
BD5B02FY1	**Physics 1** *Jaroslav Plocek **Jaroslav Plocek** Jaroslav Plocek (Gar.)*	Z,ZK	7	14KP+6KC	L	P
BD5B16MPS	**Psychology** *Josef Černohous, Alena Klesalová, Jaroslav Knápek **Jaroslav Knápek** Alena Klesalová (Gar.)*	Z	4	14KP+6KS	L	P
BD5B01MA2	*Miroslav Korbelář **Miroslav Korbelář** Petr Hájek (Gar.)*	Z,ZK	8	28KP+6KC	L	P

Number of semester: 3

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
BD5B17EMP	**Electromagnetic Field** *Jan Macháč, Zbyněk Škvor **Zbyněk Škvor** Jan Macháč (Gar.)*	Z,ZK	5	14KP+6KS	Z	P
BD5B31EO2	**Electronic Circuits 2** *Jiří Náhlík **Jiří Hospodka** Jiří Hospodka (Gar.)*	Z,ZK	5	14KP+6KC	Z	P
BD5B02FY2	**Physics 2** *Jaroslav Plocek **Jaroslav Plocek** Jaroslav Plocek (Gar.)*	Z,ZK	7	14KP+6KC	Z	P
BD5B37PPC	**C/C++ programming** *Stanislav Vítek **Stanislav Vítek** Stanislav Vítek (Gar.)*	KZ	4	14KP+6KC	Z	P
2016_BEEKPV-K	**Povinně volitelné předměty** *BD5B37AVT,BD5B31CZS,..... (see the list of groups below)*	Min. cours. 9 Max. cours. 18	Min/Max 36/72			PV

Number of semester: 4

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
BD5B38EMA	**Electrical Measurements** *Vladimír Haasz **Vladimír Haasz** Vladimír Haasz (Gar.)*	KZ	5	14P+6L	L	P
BD5B99IN1	**Individual project** *Lubor Jirásek **Lubor Jirásek***	Z	4	0+4s	L	P
BD5B34MIK	**Microcontrollers** *Tomáš Teplý, Vladimír Janíček **Tomáš Teplý** Tomáš Teplý (Gar.)*	Z,ZK	4	14KP+6KL	L	P
BD5B01STP	**Statistics and Probability** *Miroslav Korbelář, Kateřina Helisová, Veronika Sobotíková, Jaroslav Tišer **Kateřina Helisová** Kateřina Helisová (Gar.)*	Z,ZK	6	14KP+6KC	L	P
2016_BEEKPV-K	**Povinně volitelné předměty** *BD5B37AVT,BD5B31CZS,..... (see the list of groups below)*	Min. cours. 9 Max. cours. 18	Min/Max 36/72			PV
2016_BEEKVOL-K	**Volitelné předměty**	Min. cours. 0	Min/Max 0/999			V

Number of semester: 5

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
BD5B99IN2	**Individual project** *Lubor Jirásek, Vladimír Janíček*	Z	8	0+8s	Z	P
2016_BEEKPV-K	**Povinně volitelné předměty** *BD5B37AVT,BD5B31CZS,..... (see the list of groups below)*	Min. cours. 9 Max. cours. 18	Min/Max 36/72			PV
2016_BEEKVOL-K	**Volitelné předměty**	Min. cours. 0	Min/Max 0/999			V

Number of semester: 6

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
BBAP20	**Bachelor thesis** *Roman Čmejla Roman Čmejla (Gar.)*	Z	20	12S	L,Z	P
BD5B16ZFM	**Basics of Financial Management** *Blanka Kučerková, Oldřich Starý **Oldřich Starý** Oldřich Starý (Gar.)*	Z,ZK	4	14KP+6KS	L	P
2016_BEEKPV-K	**Povinně volitelné předměty** *BD5B37AVT,BD5B31CZS,..... (see the list of groups below)*	Min. cours. 9	Min/Max 36/72			PV

		Max. cours. 18				

List of groups of courses of this pass with the complete content of members of individual groups

Kód	Name of the group of courses and codes of members of this group (for specification see here or below the list of courses)	Completion	Credits	Scope	Semester	Role
2016_BEEKPV-K	**Povinně volitelné předměty**	**Min. cours. 9** **Max. cours. 18**	**Min/Max** 36/72			**PV**

BD5B37AVT	Audiovisual Technology	BD5B31CZS	Digital Signal Processing	BD5B32DAT	Data Networks
BD5B32DIT	Digital Technique	BD5B17ELD	Electrodynamics	BD5B15EN1	Power Engineering 1
BD5B15EN2	Power Engineering 2	BD5B15EN3	Power Engineering 3	BD5B13MVE	Materials for Power Electrical E ...
BD5B34MIT	Microelectronics	BD5B34SEE	Senzors in Electronics and Elect ...	BD5B37SAS	Signals and systems
BD5B17TBK	Wireless Communication Technique	BD5B13VST	Power components and technology	BD5B13VVZ	Manufacturing of Power Devices
BD5B14ZPO	Fundametals of Electric Drives	BD5B14ZSP	Electric Machines and Apparatuse ...	BD5B14ZVE	Power Electronics

2016_BEEKVOL-K	**Volitelné předměty**	**Min. cours. 0**	**Min/Max** 0/999		**V**

List of courses of this pass:

Code	Name of the course	Completion	Credits
BBAP20	Bachelor thesis	Z	20
BD5B01DRN	Differencial Equations and Numerical Analysis	Z,ZK	6
This course introduces students to the classical theory of ordinary differential equations (separable and linear ODEs) and also to bsics of numerical methods (errors in calculations and stability, numerical solutions of algebraic and differential equations and their systems). The course takes advantage of the synnergy between theoretical and practical point of view.			
BD5B01LAG	Linear Algebra	Z,ZK	8
BD5B01MA1	Mathematical Analysis 1	Z,ZK	8
The aim of the course is to introduce students to basics of differential and integral calculus of functions of one variable.			
BD5B01MA2		Z,ZK	8
BD5B01STP	Statistics and Probability	Z,ZK	6
The aim is to introduce the students to the theory of probability and mathematical statistics, and show them the computing methods together with their applications of praxis.			
BD5B02FY1	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.			
BD5B02FY2	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 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 optical waves are the subjects of the following section. Quantum mechanics and nuclear physics will complete the student?s general education in physics. The knowledge gained in this course will help to the students in study of such modern areas as robotics, computer vision, measuring technique and will allow them to understand the principles of novel technologies and functioning of new electronic devices.			
BD5B13MVE	Materials for Power Electrical Engineering	Z,ZK	4
At first a physical description of basic properties and basic types of materials for electrical engineering is carried out. Types of conductors, superconductors, insulators, magnetic materials and semiconductors, which are used in power electrical engineering, are presented. The stress is put on relationships between properties, technology and using. The student will meet, in higher detail, with ceramics for electrical engineering, with properties of mica, glass and their applications, with environmental conductive joining, with materials for thin and thick films and with selected nanomaterials and their applications.			
BD5B13VST	Power components and technology	Z,ZK	4
Production systems in electrical engineering will be characterized, their arrangement and basic technologies for mechanical joints and plastic parts. Manufacturing of windings,drying and impregnation processes will also been presented. Next part of a course will be focused on basic technologies for semiconductors including power integration. Beam technologies, technologies using plasma, packaging and basic assembly technologies will also been presented.			
BD5B13VVZ	Manufacturing of Power Devices	Z,ZK	4
The topic of the subject is focused on manufacturing of power electrical machines and devices from construction and technological point of wiev. Main part of the subject is devoted to transformers and rotating machines, namely their magnetic circuits and windings. Second half of the subject is dedicated to manufacturing of power semiconductive devices and converters including diagnostics, reliable operation. Last part of lectures deals with layouts of manufactirung, lean management and planning of manufacturing.			

BD5B14ZEL	Fundamentals of Electrotechnical Engineering	KZ	4
The course extends necessary knowledge of creating technical documentation, including oral and written presentation of technical information. The second half of the semester is focused on explaining and practicing the basic parts of electrical engineering, so that the students' initial knowledge is increased to the level needed in the following semesters.			
BD5B14ZPO	Fundametals of Electric Drives	Z,ZK	4
The course explains the basic building blocks of the electric drive. The designof components, electrical drives, typical load characteristics. Further are discussed the basic control structures for drives with DC and AC motors and components required for their implementation as the structure of a control computer circuits to switch from analog signals to digital and implementation regulators themselves in digital form.			
BD5B14ZSP	Electric Machines and Apparatuses Basics	Z,ZK	4
The course explains the principles of machines for convertsion of mechanical energy to electrical and back. It discusses the principles of basic functions and properties of rotating and non-rotating electric machines. Following the behavior of electrical machines are discussed basic devices for protection and switching, including behavioral and switching problems.			
BD5B14ZVE	Power Electronics	Z,ZK	4
The course focuses on the basic types of power semiconductor converters, which are used to change the parameters of electricity. Students are introduced to the basic principles, properties and applications of power electronic converters, their advantages, disadvantages, and fuse sizing.			
BD5B15EN1	Power Engineering 1	Z,ZK	4
BD5B15EN2	Power Engineering 2	Z,ZK	4
BD5B15EN3	Power Engineering 3	KZ	4
BD5B16MME	Macro and Microekonomics	Z,ZK	4
BD5B16MPS	Psychology	Z	4
Psychology of personality, psychology of work and organization. Psychology in human resources management. The manager, his role and competencies. Motivation and engagement. Skills development. Communication and conflict resolution. Work group and team, conducting meetings. Time management and delegation. Dealing with stress and emotions. Company culture and organizational change.			
BD5B16ZFM	Basics of Financial Management	Z,ZK	4
BD5B17ELD	Electrodynamics	KZ	4
This subject empowers its students with a unified approach to time-varying electromagnetic fields and waves.			
BD5B17EMP	Electromagnetic Field	Z,ZK	5
This course gets its students acquinted with principles and applied electromagnetic field theory basics.			
BD5B17TBK	Wireless Communication Technique	Z,ZK	4
Wireless communications belong to the fastest developing technical fields. Besides widely used mobile telephony systems, this field also includes many other both mobile and stationary communicating systems. Different types of radio modems are also built in the majority of electronic devices like PCs, tablets, notebooks, cameras, etc. With expected fast development of Internet of Things, operation of billions of wireless sensors is expected. The subject is common to all students of the Electronics and Communication study program, its main purpose is to teach all important aspects of this technical branch. Obtained knowledge should enable the students to design, project, adjust or manufacture any wireless communication system or its components. Besides wireless system analysis, the lectures include review of physical backgrounds, survey of the most important existing radio systems together with corresponding operational frequencies, description of electromagnetic wave propagation and related antennas. Instructions concerning propagation also cover behavior of EM waves in an urban environment or inside buildings. Lectures concerning analysis of typical wireless systems also cover description of related radio-frequency, microwave and mm-wave circuits and components. Exercises include practical calculations of wireless systems, computer analysis and synthesis of important structures and circuits, and related laboratory measurements.			
BD5B31CZS	Digital Signal Processing	Z,ZK	4
BD5B31EO1	Electronic Circuits 1	Z,ZK	5
BD5B31EO2	Electronic Circuits 2	Z,ZK	5
BD5B32DAT	Data Networks	Z,ZK	4
The course introduces students with the fundamentals of data communication networks. The course objective is to provide broader understanding of various communication protocols used in specific types of data networks based on the layered OSI model. The course also provides students with fundamental understanding of TCP/IP protocol family as it is used in the Internet era of networking, including practical experience with the data networks in laboratory.			
BD5B32DIT	Digital Technique	Z,ZK	4
The goal of this course is to provide the introduction into designing and realization of digital circuits. First, necessary mathematical apparatus, such as the Boolean algebra, Karnaugh maps, minimization and realization of logical functions is presented, followed by brief introduction into basics of logical circuits, such as the logical gates, flip-flops, TTL and CMOS logic etc. The second part is dedicated mainly to modern designing techniques of digital circuits using programmable FPGA and VHDL language. During these lessons, the basics of VHDL together with numerous examples are evaluated to provide a complex insight into this hardware description language and modern methods of designing and realization of digital circuits.			
BD5B34EPS	Electronics	KZ	4
BD5B34MIK	Microcontrollers	Z,ZK	4
The goal of this course is to make students acquainted with recent interesting applications, smart sensors circuits and peripherals handled by microcontrollers. In a lab students will program their own applications and measure actual properties. Because of usage of a programming language C it will be possible to focus on the practical part of the realization.			
BD5B34MIT	Microelectronics	Z,ZK	4
Students become familiar with the latest trends in the field of microelectronics. The course provide students with the microelectronic structures and technologies of integrated circuits; micro sensors and micro-electro-mechanical systems. The course introduces students to the design of nanoelectronics and integrated circuits.			
BD5B34SEE	Senzors in Electronics and Electrotechnology	Z,ZK	4
BD5B36PRP	Procedural Programming	Z,ZK	6
The course accompanies basic programming emphasizing the data representation in computer memory. Furthermore, the concepts of linked data structures and processing user inputs are developed. Students master the practical implementation of simple individual tasks. The course emphasizes acquiring programming habits for creating readable and reusable programs. At the same time, the effort is to build students an overview of the program operation, data model, memory access, and management. Therefore, the C programming language is used that provides a direct link between the program data structures and their representation in the computer memory. Students will get acquainted not only with program compilation and linking but also with debugging and profiling. Labs aim to acquire practical skills of implementing simple individual tasks, emphasizing functionality and accuracy of implementation. Student independence is developed by a set of homework with the possibility of optional and bonus assignments. The final task is an integration of a larger program using existing implementations. Evaluation of coding style motivated by writing legible, understandable, and maintainable codes is also a part of the selected tasks.			
BD5B37AVT	Audiovisual Technology	Z,ZK	4
This course is the introduction to multimedia technology (audio and video). It overviews sound and picture acquisition, signal processing, transmission and distribution, recording and reproduction including physiology of hearing and vision. It provides fundamental information for understanding the main principles for system solutions in the field.			
BD5B37PPC	C/C++ programming	KZ	4
BD5B37SAS	Signals and systems	Z,ZK	4
Introductory course focused on a description of continuous- and discrete-time signals and systems in time and frequency domains. The course also introduces the basic characteristics of bandpass signals, analog modulations and random signals.			

BD5B38EMA	Electrical Measurements	KZ	5
BD5B99IN1	Individual project	Z	4
BD5B99IN2	Individual project	Z	8
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.			

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