Recomended pass through the study plan

Name of the pass: Electronics and Communications - Passage through study

Faculty/Institute/Others: Faculty of Electrical Engineering Department: Pass through the study plan: Electronics and Communications 2018 Branch of study guranteed by the department: Common courses Guarantor of the study branch: Program of study: Electronics and Communications Type of study: Bachelor full-time 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 seme	ester: 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 Havlí ek, Vladimír K la Radek Havlí ek Vladimír K la (Gar.)	Z	0	2BP+2BC	Z,L	Ρ
B2B32DATA	Data Networks Leoš Bohá , Pavel Bezpalec, Petr Hampl, Ji í Hole ek, Petr Jareš, Ján Ku erák Ján Ku erák Leoš Bohá (Gar.)	КZ	5	2P + 2L	Z	Ρ
B0B01LAGA	Linear Algebra Ji í Velebil, Jakub Rondoš, Martin Bohata, Alena Gollová, Natalie Žukovec, Daniel Gromada, Josef Dvo ák, Mat j Dostál Ji í Velebil Ji í Velebil (Gar.)	Z,ZK	7	4P+2S	Z	Ρ
B0B01MA1A	Mathematical Analysis 1 Martin Bohata, Josef Dvo ák, Veronika Sobotíková, Karel Pospíšil Veronika Sobotíková Veronika Sobotíková (Gar.)	Z,ZK	6	4P+2S	Z	Ρ
B0B99PRPA	Procedural Programming Stanislav Vítek Stanislav Vítek (Gar.)	KZ	4	2P+2C	Z	Р
BEZZ	Basic Health and Occupational Safety Regulations Ivana Nová, Radek Havlí ek, Vladimír K la Radek Havlí ek Vladimír K la (Gar.)	Z	0	2BP+2BC	Z	Ρ
B2B14ZEK	Fundamentals of electrotechnics Jan Bauer, David Bušek Jan Bauer Jan Bauer (Gar.)	KZ	4	2P+1L		Р
2018_BEKP2	Povinn volitelné p edm ty 2 B2B16EPO,B2B99EKP	Min. cours. 1 Max. cours. 2	Min/Max 4/8			PV

Number of ser	mester: 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
B0B01DRN	Differencial Equations and Numerical Analysis Jakub Rondoš, Daniel Gromada, Josef Dvo ák, Petr Habala, Jakub Stan k Petr Habala Petr Habala (Gar.)	Z,ZK	4	2P+2C	L	Р
B2B02FY1	Physics 1 Petr Kulhánek, Petr Koní ek Petr Kulhánek Petr Kulhánek (Gar.)	Z,ZK	8	4P+1L+2C	; L	Р
B0B01MA2A	Mathematical Analysis 2 Veronika Sobotíková, Jaroslav Tišer, Martin Kepela, Miroslav Korbelá Jaroslav Tišer Jaroslav Tišer (Gar.)	Z,ZK	6	4P+2S	L	Ρ
B2B99PPC	Practical C/C++ programming Stanislav Vítek Stanislav Vítek (Gar.)	KZ	6	2P+2C	L	Р
B2B31ZEOA	Fundamentals of Electric Circuits Roman mejla, Pavel Máša Roman mejla Roman mejla (Gar.)	Z,ZK	5	2P+2L	L	Р

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
B2B32DITA	Digital Technique Pavel Lafata, Tomáš Zeman Pavel Lafata Pavel Lafata (Gar.)	KZ	4	2P + 2L	Z	Р
B2B38EMB	Electrical Measurements Jakub Svatoš, Vladimír Haasz Jakub Svatoš Jakub Svatoš (Gar.)	Z,ZK	4	2P+2L	Z	Р
B2B17EMPA	Electromagnetic Field Vít zslav Pankrác Vít zslav Pankrác (Gar.)	Z,ZK	5	2P+2C	Z	Р
B2B34ELPA	Electron Devices Pavel Hazdra, Tomáš Martan, Alexandr Laposa, Jan Novák, Tomáš Teplý, Vít Záhlava Pavel Hazdra Pavel Hazdra (Gar.)	Z,ZK	5	2P+2L	Z	Р
B2B02FY2	Physics 2 Petr Kulhánek, Petr Koní ek Petr Kulhánek Petr Kulhánek (Gar.)	Z,ZK	7	3P+1L+2C	Z	Р
B0B01KANA	Complex Analysis Zden k Mihula, Hana Tur inová Zden k Mihula Zden k Mihula (Gar.)	Z,ZK	4	2P+2S	Z	Р

Number of sei	mester: 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
B2B37AVT	Audiovisual Technology František Rund, Petr Páta, Libor Husník, Miloš Klíma, Karel Fliegel Karel Fliegel Petr Páta (Gar.)	КZ	4	2P+2L	L	Ρ
B2B17ELD	Electrodynamics Vít zslav Pankrác, Zbyn k Škvor, Lukáš Jelínek, Miloslav apek Jan Kra ek Zbyn k Škvor (Gar.)	Z,ZK	4	2P+2C	L	Ρ
B2B31EO1	Electronic Circuits 1 Michal Šimek, Ji í Hospodka, Jan Havlík Ji í Hospodka Ji í Hospodka (Gar.)	Z,ZK	4	2P+2L	L	Ρ
B2B34SEE	Sesors in Electronics Alexandr Laposa, Tomáš Teplý, Adam Bou a, Miroslav Husák Miroslav Husák Miroslav Husák (Gar.)	Z,ZK	4	2P+2L	L	Ρ
B2B37SAS	Signals and systems Václav Navrátil, Karel Fliegel, Pavel Puri er Karel Fliegel Karel Fliegel (Gar.)	Z,ZK	5	2P+2C	L	Ρ
B0B01STP	Statistics and Probability Jakub Stan k, Miroslav Korbelá, Kate ina Helisová, Bogdan Radovi Kate ina Helisová Kate ina Helisová (Gar.)	Z,ZK	5	2P+2S	L	Ρ
B2B17TBK	Wireless Communication Technique Viktor Adler, P emysl Hudec, Pavel Pecha , Tomáš Ko ínek, Václav Kabourek, Jan Spá il P emysl Hudec P emysl Hudec (Gar.)	КZ	4	2P+2L	L	Ρ

Number of sem	nester: 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
B2B31CZS	Digital Signal processing Petr Pollák, Petr Krýže Pavel Sovka Pavel Sovka (Gar.)	Z,ZK	4	2P+2C	Z	Р
B2B34MIT	Microelectronics Vladimír Janí ek, Ji í Jakovenko Vladimír Janí ek Ji í Jakovenko (Gar.)	KZ	4	2P+2L	Z	Р
B2BPROJ6	Bachelor project Vladimír Janí ek, Pavel Máša, František Rund, Lubor Jirásek, Jan Šístek, Ivan Pravda František Rund František Rund (Gar.)	KZ	6	4s	Z,L	Ρ
B2B99TPS	Technical Writing Ivana Nová, František Rund, Jan Šístek František Rund Jan Šístek (Gar.)	KZ	4	2P+2C	Z	Р
B2B32TSI	Telecommunication Systems and Networks Petr Jareš, Ivan Pravda Ivan Pravda	KZ	4	2P + 2L	Z	Р
		Min. cours.				
	Povinn volitelné p edm ty programu	4	Min/Max			
2018_BEKPV	B2B31EO2,B2B34MIK, (see the list of groups below)	Max. cours.	16/45			PV
		11				

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 mejla Roman mejla (Gar.)	Z	20	12S	L,Z	Ρ
2018_BEKPV	Povinn volitelné p edm ty programu B2B31EO2,B2B34MIK, (see the list of groups below)	Min. cours. 4 Max. cours. 11	Min/Max 16/45			PV
2018_BEKVOL	Volitelné odborné p edm ty	Min. cours. 0	Min/Max 0/999			V

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

Kód		Name of the group of group (for specification	courses and	d codes of members of this or below the list of courses)	Com	pletion	Credit	s Scope	Semester	Role
2018_BEKP2		Povinn volitelné p edm tv 2		Min. cours. 1 Max. cours. 2		Min/Ma	/in/Max		PV	
B2B16EPO	Business e	conomics	B2B99EKP	Electronics and communication pr					11	
2018_BEKPV Povinn		Povinn v	olitelné p ed	m ty programu		cours. 4 . cours. 11	Min/Ma			PV
B2B31EO2	Electronic	Circuits 2	B2B34MIK	Microcontrollers		B0B37N	SI	Design of IoT	systems	
B2B17OKS	Optical Co	mmunication Systems	B2B34OZD	Optical sources and detectors of		B2B32P	PS	Network Plan	ning and Opera	ation
B2B37ROZ	Radio Circ	uits and Devices	B2B32STE	Network Technologies		B0B02U	AK	Introduction to	Acoustic	
B2B17VDP	Transmissi	on Lines for Data Tran	B2B37ZST	Principles of Studio Technology						
2018_BE	KVOL	Volite	elné odborné	p edm ty	Min.	cours. 0	Min/Ma 0/999			v

List of courses of this pass:

Code	Name of the course	Completion	Credits
B0B01DRN	Differencial Equations and Numerical Analysis	Z,ZK	4
This course introduc	ces students to the classical theory of ordinary differential equations (separable and linear ODEs) and also to bsics of numerical meth	nods (errors in calc	ulations and
stability, numerica	I solutions of algebraic and differential equations and their systems). The course takes advantage of the synnergy between theoretic	al and practical po	int of view.
B0B01KANA	Complex Analysis	Z,ZK	4
The course is an	introduction to the fundamentals of complex analysis and its applications. The basic principles of Fourier, Laplace, and Z-transform a	are explained, inclu	ding their
	applications, particularly to solving differential and difference equations.		
B0B01LAGA	Linear Algebra	Z,ZK	7
The course covers i	ntroductory topics of linear algebra. It begins with fundamental concepts related to vector spaces and linear transform (such as linear d	ependence and inc	dependence
of vectors, bases, c	oordinates of vectors, etc.). The next part of the course is devoted to matrix theory (determinants, inverse matrix, matrices of linear tr	•	•
	oordinates of vectors, etc.). The next part of the course is devoted to matrix theory (determinants, inverse matrix, matrices of linear tr ications include solving systems of linear equations, geometry in three-dimensional space (including dot and cross products), and the	ansformation, eige	nvalues and
		ansformation, eige	nvalues and
	ications include solving systems of linear equations, geometry in three-dimensional space (including dot and cross products), and the	ansformation, eige	nvalues and
eigenvectors). Appli	ications include solving systems of linear equations, geometry in three-dimensional space (including dot and cross products), and the of a matrix.	ansformation, eige e singular value de	nvalues and composition
eigenvectors). Appli	ications include solving systems of linear equations, geometry in three-dimensional space (including dot and cross products), and the of a matrix. Mathematical Analysis 1	ansformation, eige e singular value de	nvalues and composition
eigenvectors). Appli B0B01MA1A B0B01MA2A	ications include solving systems of linear equations, geometry in three-dimensional space (including dot and cross products), and the of a matrix. Mathematical Analysis 1 This is an introductory course to differential and integral calculus of functions of one real variable.	ansformation, eige e singular value de Z,ZK Z,ZK	composition 6 6
eigenvectors). Appli B0B01MA1A B0B01MA2A	ications include solving systems of linear equations, geometry in three-dimensional space (including dot and cross products), and the of a matrix. Mathematical Analysis 1 This is an introductory course to differential and integral calculus of functions of one real variable. Mathematical Analysis 2	ansformation, eige e singular value de Z,ZK Z,ZK	composition 6 6
eigenvectors). Appli B0B01MA1A B0B01MA2A	ications include solving systems of linear equations, geometry in three-dimensional space (including dot and cross products), and the of a matrix. Mathematical Analysis 1 This is an introductory course to differential and integral calculus of functions of one real variable. Mathematical Analysis 2 's an introduction to the differential and integral calculus in several variables and basic relations between curve and surface integrals	ansformation, eige e singular value de Z,ZK Z,ZK	composition 6 6
eigenvectors). Appli B0B01MA1A B0B01MA2A The subject cover B0B01STP	ications include solving systems of linear equations, geometry in three-dimensional space (including dot and cross products), and the of a matrix. Mathematical Analysis 1 This is an introductory course to differential and integral calculus of functions of one real variable. Mathematical Analysis 2 rs an introduction to the differential and integral calculus in several variables and basic relations between curve and surface integrals series and power series with application to Taylor and Fourier series.	ansformation, eige e singular value de Z,ZK Z,ZK . Other part contair Z,ZK	nvalues and composition 6 s function 5

B0B02UAK	Introduction to Acoustic	KZ	4
	vides overview of main parts of acoustics. In first lectures there is introduction to basic types of sound fields, its solutions and propertie		deals with
introduction to build	ding and room acoustics. The second half of the course deals with introductions to physiological acoustics, psychoacoustics, musical	acoustics, hygien	e legislation
	and ultrasound, infrasound and their measurement.		
B0B37NSI	Design of IoT systems	Z,ZK	5
B0B99PRPA	Procedural Programming	KZ	4
B2B02FY1	Physics 1	Z,ZK	8
The basic course of	f physics at the Faculty of Electrical Engineering - Physics 1, is devoted to the introduction into two important areas of physics. The first	t one is a classica	al mechanics
	e is the electric and magnetic field. Within the framework of the classical mechanics, the students study the particle kinematics; dynamic	-	-
-	and rigid bodies. The students should be able to solve basic problems dealing with the description of mechanical systems, which they	-	
	cal mechanics is followed by the relativistic mechanics, electric and magnetic field - both stationary as well as non-stationary. The stud e study of electrical circuits, theory of electrotechnical materials or radioelectronics. Apart of this, the knowledge gained in this course i		-
	consecutive course Physics 2.		
B2B02FY2	Physics 2	Z,ZK	7
- the theory of wave universal charact	s 2 is closely linked with the course Physics 1. Within the framework of this course the students will first of all learn foundations of ther es - will give to the students basic insight into the properties of waves and will help to the students to understand that the presented d ter in spite of the waves character. Particular types of waves, such as acoustic or optical waves are the subjects of the following section	escription of the n. Quantum mecl	waves has a nanics and
	vill complete the student?s general education in physics. The knowledge gained in this course will help to the students in study of such		is robotics,
	nputer vision, measuring technique and will allow them to understand the principles of novel technologies and functioning of new elect		
B2B14ZEK	Fundamentals of electrotechnics	KZ	4
B2B16EPO	Business economics	KZ	4
	Business Economics deals with the subject from wide angle of view, discussing all particular aspects of Business Economics, and rel		1
B2B17ELD	Electrodynamics	Z,ZK	4
	This subject empowers its students with a unified approach to time-varying electromagnetic fields and waves.		
B2B17EMPA	Electromagnetic Field	Z,ZK	5
	This course gets its students acquinted with principles and applied electromagnetic field theory basics.		-
B2B17OKS	Optical Communication Systems	Z,ZK	4
	urse is to introduce students with principles of optical systems. The course covers both theoretical background of optics and practical a		-
optical systems. Sti	udents extend their knowledge from the ray optics through the matrix optics, subsequently and further by the description of optical sys towards wave and quantum optics. Then students will learn the basic mechanisms and principles of fiber optics.	stems using Gaus	sian beams
B2B17TBK	Wireless Communication Technique	KZ	4
Wireless communic	zations belong to the fastest developing technical fields. Besides widely used mobile telephony systems, this field also includes many oth	her both mobile a	d stationary
		loi bour mobilo u	ia stational
	stems. Different types of radio modems are also built in the majority of electronic devices like PCs, tablets, notebooks, cameras, etc. Wi		-
communicating sys	stems. Different types of radio modems are also built in the majority of electronic devices like PCs, tablets, notebooks, cameras, etc. Wi s. operation of billions of wireless sensors is expected. The subject is common to all students of the Electronics and Communication stu	ith expected fast	developmen
communicating sys of Internet of Things	s, operation of billions of wireless sensors is expected. The subject is common to all students of the Electronics and Communication stu	ith expected fast of ady program, its n	developmen nain purpose
communicating sys of Internet of Things is to teach all impor	s, operation of billions of wireless sensors is expected. The subject is common to all students of the Electronics and Communication stu rtant aspects of this technical branch. Obtained knowledge should enable the students to design, project, adjust or manufacture any wi	ith expected fast udy program, its n reless communic	developmen nain purpose ation systen
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B2B32STE	Network Technologies	Z,ZK	4
The primary task	of this subject is to move further already acquired fundamental networking knowledge in the context of Data Networks subject. Stude	nts will comprehen	d working
principles of variou	is methods to access common shared physical media, Ethernet switching technologies and WiFi networks and last but not least they	v will also master ar	n essential
networking theory a	as used in real practice. Students will be given a chance to get in touch with technology to implement simple routed and switched net	works in the univers	sity network
	lab.	_	
B2B32TSI	Telecommunication Systems and Networks	KZ	4
The course intro	oduces principles and functions of digital telecommunications systems, both transmission and switching systems as well as converge	d packet-oriented s	systems
	interconnected into universal telecommunication networks.		
B2B34ELPA	Electron Devices	Z,ZK	5
	ces the basic theory, principles of operation and properties of electron devices. Physical principles of operation, device structures and ate models for small- and large-signal. Basic applications in analogue and digital electronics are examined. In seminars and labs, str		•
	simulation, measurement of device characteristics and extraction of device parameters. Operation of electron devices in electronic c		
principles of device	the PSpice simulator.		iyzed doing
B2B34MIK	Microcontrollers	Z,ZK	4
	burse is to make students acquainted with recent interesting applications, smart sensors circuits and peripherals handled by microcor	I ' I	
-	n applications and measure actual properties. Because of usage of a programming language C it will be possible to focus on the pra		
B2B34MIT	Microelectronics	KZ	4
-	amiliar with the latest trends in the field of microelectronics. The course provide students with the microelectronic structures and tech	I ·· I	-
	micro sensors and micro-electro-mechanical systems. The course introduces students to the design of nanoelectronics and integrate		,
B2B34OZD	Optical sources and detectors of radiation	Z,ZK	4
	burse is to explain the principle of optical sources, optical amplifiers and photodetectors and their technology. Then discuss their use		-
including optical inf	egrated circuits, both from a theoretical and a broader application point of view. Attention is also paid to components for optical comr	nunication and to c	omponents
	for physical and chemical quantities, important measuring and diagnostic methods are given.		
B2B34SEE	Sesors in Electronics	Z,ZK	4
B2B37AVT	Audiovisual Technology	KZ	4
This course is the i	ntroduction to multimedia technology (audio and video). It overviews sound and picture acquisition, signal processing, transmission a	and distribution, rec	ording and
reproduc	tion including physiology of hearing and vision. It provides fundamental information for understanding the main principles for system s	solutions in the field	d.
B2B37ROZ	Radio Circuits and Devices	Z,ZK	4
	ns a basic but systematical description of fundamental types of analog and digital modulations. A description of the building blocks of	· · ·	on systems
	f radio receivers follows. A description of passive and active elements with non-distributed and distributed parameters follows from th		
radio circuits. Atte	ention is devoted to contemporary structures with distributed parameters, microwave transistors of various types, power unipolar trans	sistors. A descriptio	n of radio
function blocks is	a fundamental part of the subject: radio-frequency amplifiers and their noise properties, distributed amplifiers, power amplifiers, osc	illators, phase nois	e, crystal
	oscillators, mixers, double and multiply-balanced mixers.		
B2B37SAS	Signals and systems	Z,ZK	5
Introductory course	focused on a description of continuous- and discrete-time signals and systems in time and frequency domains. The course also introd	luces the basic cha	aracteristics
	of bandpass signals, analog modulations and random signals.		
B2B37ZST	Principles of Studio Technology	Z,ZK	4
The course gives b	asic knowledge of elements and systems used in television and radio professional and semiprofessional studio technology and of tec	hnology of radio an	d television
	production and broadcasting. Laboratory exercises are situated in a small school studio and are completed with professional excu	ursions.	
B2B38EMB	Electrical Measurements	Z,ZK	4
Methods of meas	urement of electrical quantities (voltage, current, power, frequency, resistance, capacitance, and inductance) are explained together v	with principles of the	eir correct
application and ac	curacy estimation. The course is closed by presenting information on several basic electronic measuring instruments and explaining to	the fundamentals o	f magnetic
	measurements and basic information concerning measurement systems.	<u>г</u>	
B2B99EKP	Electronics and communication practically	KZ	4
	oted to practical experiments with the ESP 32 SoC board and a set of external add-on modules. Students will get acquainted with the		
	sual Code Studio using libraries for operating internal and external peripherals. Sample applications are focused on standardized issu		
focus of the Elect	ronics and Communications program. Part of the exercise will be devoted to the description of the design of printed circuit boards, the	eir production and r	mounting.
	Students will get a board with SoC ESP32 for experimentation, which they can also use for home preparation.	1/7	
B2B99PPC	Practical C/C++ programming	KZ	6
	ces students to the C ++ and develops their practical skills in programming in C/C++ with an emphasis on solving computational tasks a		
	amming. The first part of the course is devoted to the object-oriented programming in C++ and provides students with basic data cont principles of parallel programming, multi-threaded applications, synchronization mechanisms and models of multi-threaded applications		
	rithmic thinking to solve computational problems by searching the problem state space. Two main approaches are considered: the de		
	he state space; and local optimization techniques. Additionally, students will be familiarized with models of arbitrary precision data re		
representation of	of matrices, and matrix calculations.	procentatione, repr	000111011
B2B99TPS	Technical Writing	KZ	4
	o help students with various technical or scientific reports (lab report, article, final thesis etc.) Also important is, in addition to language		
	present scientific information. Given are also up-to-date methods for efficient typing and document automation, including LaTeX. All t		
	tasks in the Moodle.		-
B2BPROJ6	Bachelor project	KZ	6
	in the form of a project. A student will choose a topic from a range of topics related to his or her branch of study, which will be specif	1 1	
	branch departments. The project will be defended within the framework of a subject.		
BBAP20	Bachelor thesis	Z	20
BEZB	Safety in Electrical Engineering for a Bachelor's Degree	Z	0
	safety course is to give the students basic knowledge of electrical equipment and installation as to avoid danger arising from operation	I I	-
	imentals of Safety Electrical Engineering. In this way the students receive qualification of instructed person that enables them to work		-
BEZZ	Basic Health and Occupational Safety Regulations	Z	0
	e worked out based on The Training Scheme for Health and Occupational Safety designed for employees and students of the Czech	1 1	
-	d by the Rector's Office of the CTU. Safety is considered one of the basic duties of all employees and students. The knowledge of He	-	-
	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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