# Study plan

# Name of study plan: Electronics and Communications 2018

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: Electronics and Communications Type of study: Bachelor full-time Required credits: 176 Elective courses credits: 4 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: 156 The role of the block: P

Code of the group: 2018\_BEKBAP Name of the group: Bachelor Project Requirement credits in the group: In this group you have to gain 20 credits Requirement courses in the group: In this group you have to complete 1 course Credits in the group: 20 Note on the group:

	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their 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

Ζ

20

## Characteristics of the courses of this group of Study Plan: Code=2018\_BEKBAP Name=Bachelor Project

## Code of the group: 2018\_BEKBBE

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	Safety in Electrical Engineering for a Bachelor's Degree Ivana Nová, Radek Havlí ek, Vladimír K la <b>Radek Havlí ek</b> Vladimír K la (Gar.)	Z	0	2BP+2BC	Z,L	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	Р

## Characteristics of the courses of this group of Study Plan: Code=2018\_BEKBBE Name=Safety of the bachelor's studies

	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: 2018\_BEKH Name of the group: Humanities subjects 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
B0B16ET1	Ethic 1 Vladimír Sláme ka Vladimír Sláme ka Vladimír Sláme ka (Gar.)	KZ	4	2P+2C	Z	Р
B0B16FIL	Philosophy Peter Zamarovský Peter Zamarovský Peter Zamarovský (Gar.)	ZK	2	2P+0S	Z,L	Ρ
B0B16FI1	Philosophy 1 Peter Zamarovský Peter Zamarovský Peter Zamarovský (Gar.)	KZ	4	2P+2S	Z	Ρ
B0B16HTE	History of technology and economic Marcela Efmertová, Jan Mikeš Marcela Efmertová Marcela Efmertová (Gar.)	ZK	2	2P+0S	Z,L	Ρ
B0B16HT1	History of science and technology 1 Marcela Efmertová, Jan Mikeš Marcela Efmertová Marcela Efmertová (Gar.)	KZ	4	2P+2S	Z	Ρ
B0B16HI1	History 1 Milena Josefovi ová Milena Josefovi ová Milena Josefovi ová (Gar.)	KZ	4	2P+2S	Z	Ρ
B0B16MPS	<b>Psychology</b> Jan Fiala <b>Jan Fiala</b> Jan Fiala (Gar.)	Z,ZK	4	2P+2S	Z,L	Ρ
B0B16MPL	Psychology for managers Jan Fiala Jan Fiala Jan Fiala (Gar.)	ZK	2	2P+0S	Z,L	Р

#### Characteristics of the courses of this group of Study Plan: Code=2018\_BEKH Name=Humanities subjects

B0B16ET1 Ethic 1 ΚZ 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. 2 B0B16FIL Philosophy ΖK 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. B0B16FI1 Philosophy 1 ΚZ 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. B0B16HTE History of technology and economic ZK 2 B0B16HT1 History of science and technology 1 ΚZ 4 B0B16HI1 ΚZ 4 History 1 B0B16MPS Psychology Z,ZK 4 B0B16MPL Psychology for managers ΖK 2

## Code of the group: 2018\_BEKP

Name of the group: Compulsory subjects of the programme

Requirement credits in the group: In this group you have to gain 136 credits

Requirement courses in the group: In this group you have to complete 28 courses

#### Credits in the group: 136

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
B2B37AVT	Audiovisual Technology František Rund, Petr Páta, Libor Husník, Miloš Klíma, Karel Fliegel Karel Fliegel Petr Páta (Gar.)	КZ	4	2P+2L	L	Ρ
B2B31CZS	Digital Signal processing Petr Pollák, Petr Krýže <b>Pavel Sovka</b> Pavel Sovka (Gar.)	Z,ZK	4	2P+2C	Z	Р
B2B32DATA	<b>Data Networks</b> Leoš Bohá , Pavel Bezpalec, Petr Hampl, Ji í Hole ek, Petr Jareš, Ján Ku erák <b>Ján Ku erák</b> Leoš Bohá (Gar.)	КZ	5	2P + 2L	z	Ρ
B0B01DRN	Differencial Equations and Numerical Analysis Petr Habala, Jakub Rondoš, Jakub Stan k, Daniel Gromada, Josef Dvo ák Petr Habala Petr Habala (Gar.)	Z,ZK	4	2P+2C	L	Ρ
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 <b>Jakub Svatoš</b> Jakub Svatoš (Gar.)	Z,ZK	4	2P+2L	Z	Р

B2B17ELD	Electrodynamics Zbyn k Škvor, Vít zslav Pankrác, Lukáš Jelínek, Miloslav apek <b>Jan Kra ek</b> Zbyn k Škvor (Gar.)	Z,ZK	4	2P+2C	L	Р
B2B17EMPA	Electromagnetic Field Vít zslav Pankrác Vít zslav Pankrác (Gar.)	Z,ZK	5	2P+2C	Z	Р
B2B31EO1	Electronic Circuits 1 Ji í Hospodka, Michal Šimek, Jan Havlík <b>Ji í Hospodka</b> Ji í Hospodka (Gar.)	Z,ZK	4	2P+2L	L	Р
B2B34ELPA	Electron Devices Pavel Hazdra, Tomáš Martan, Alexandr Laposa, Jan Novák, Tomáš Teplý, Vít Záhlava <b>Pavel Hazdra</b> Pavel Hazdra (Gar.)	Z,ZK	5	2P+2L	Z	Р
B2B02FY1	Physics 1 Petr Kulhánek, Petr Koní ek Petr Kulhánek Petr Kulhánek (Gar.)	Z,ZK	8	4P+1L+2C	L	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
B0B01LAGA	Linear Algebra Jakub Rondoš, Daniel Gromada, Josef Dvo ák, Ji í Velebil, Martin Bohata, Alena Gollová, Natalie Žukovec, Mat j Dostál <b>Ji í Velebil</b> Ji í Velebil (Gar.)	Z,ZK	7	4P+2S	Z	Р
B0B01MA1A	Mathematical Analysis 1 Josef Dvo ák, Martin Bohata, Veronika Sobotíková, Karel Pospíšil Veronika Sobotíková Veronika Sobotíková (Gar.)	Z,ZK	6	4P+2S	Z	Р
B0B01MA2A	Mathematical Analysis 2 Veronika Sobotiková, Jaroslav Tišer, Martin K epela, Miroslav Korbelá Jaroslav Tišer Jaroslav Tišer (Gar.)	Z,ZK	6	4P+2S	L	Р
B2B34MIT	Microelectronics Vladimír Janí ek, Ji í Jakovenko Vladimír Janí ek Ji í Jakovenko (Gar.)	KZ	4	2P+2L	Z	Р
B2B99PPC	Practical C/C++ programming Stanislav Vítek Stanislav Vítek (Gar.)	KZ	6	2P+2C	L	Р
B0B99PRPA	Procedural Programming Stanislav Vítek Stanislav Vítek (Gar.)	KZ	4	2P+2C	Z	Р
B2BPROJ6	Bachelor project František Rund, Vladimír Janí ek, Pavel Máša, Lubor Jirásek, Jan Šístek, Ivan Pravda František Rund František Rund (Gar.)	ΚZ	6	4s	Z,L	Р
B2B34SEE	Sesors in Electronics Miroslav Husák, Alexandr Laposa, Tomáš Teplý, Adam Bou a Miroslav Husák Miroslav Husák (Gar.)	Z,ZK	4	2P+2L	L	Р
B2B37SAS	Signals and systems Karel Fliegel, Václav Navrátil, Pavel Puri er Karel Fliegel Karel Fliegel (Gar.)	Z,ZK	5	2P+2C	L	Р
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	Р
B2B99TPS	Technical Writing Ivana Nová, František Rund, Jan Šístek František Rund Jan Šístek (Gar.)	KZ	4	2P+2C	Z	Р
B2B17TBK	Wireless Communication Technique P emysl Hudec, Pavel Pecha, Tomáš Ko ínek, Viktor Adler, Václav Kabourek, Jan Spá il <b>P emysl Hudec</b> P emysl Hudec (Gar.)	KZ	4	2P+2L	L	Р
B2B32TSI	Telecommunication Systems and Networks Petr Jareš, Ivan Pravda Ivan Pravda	KZ	4	2P + 2L	Z	Р
B2B31ZEOA	Fundamentals of Electric Circuits Roman mejla, Pavel Máša Roman mejla Roman mejla (Gar.)	Z,ZK	5	2P+2L	L	Р
B2B14ZEK	Fundamentals of electrotechnics Jan Bauer, David Bušek Jan Bauer Jan Bauer (Gar.)	KZ	4	2P+1L		Р
Characteristics of th	e courses of this group of Study Plan: Code=2018_BEKP Name=	Compulso	y subje	cts of the	programr	ne
This course is the introduct	udiovisual Technology iion to multimedia technology (audio and video). It overviews sound and picture acquisition			mission and o		4 ecording and
	siology of hearing and vision. It provides fundamental information for understanding the n igital Signal processing	nain principles f	or system s		,ZK	4
	about basic methods of digital signal processing and their applications (examples from s	speech and biol	ogical signa			
	stics in time and frequency domain, Fourier transform, fast algorithms for DFT computatio		•	er design, dig	ital filtering ir	n time and
	tion and interpolation and their usage in filter banks, basics of LPC analysis. Further deta //vyu/ae2m99czs>http://noel.feld.cvut.cz/vyu/ae2m99czs	ilis can be found	i at <a< td=""><td></td><td></td><td></td></a<>			
1 -	ata Networks				KZ	5
-	lents with the fundamentals of data communication networks. The course objective is to p	provide broader	understand	1	1	-
	ta networks based on the layered OSI model. The course also provides students with fur	ndamental unde	rstanding o	of TCP/IP prote	ocol family as	s it is used in
	ng, including practical experience with the data networks in laboratory.				71/	А
	ifferencial Equations and Numerical Analysis dents to the classical theory of ordinary differential equations (separable and linear ODEs)	and also to be	cs of nume		,ZK	4 Iculations and
	s of algebraic and differential equations and their systems). The course takes advantage					
	igital Technique	,	-		KZ	4
1	p provide the introduction into designing and realization of digital circuits. First, necessary	mathematical a	apparatus,			-
	alization of logical functions is presented, followed by brief introduction into basics of logical		•		•	•
etc. The second part is ded	licated mainly to modern designing techniques of digital circuits using programmable FPC			-		
agothor with num	amples are evaluated to provide a complex insight into this hardware description language					

DODOOEMD		7 71/	4
B2B38EMB	Electrical Measurements	Z,ZK	4
	ent of electrical quantities (voltage, current, power, frequency, resistance, capacitance, and inductance) are explained togethe		
	cy estimation. The course is closed by presenting information on several basic electronic measuring instruments and explaining information concerning measurement eventure.	ig the fundamenta	als of magnetic
	ic information concerning measurement systems.	7 71/	4
B2B17ELD	Electrodynamics	Z,ZK	4
, ,	its students with a unified approach to time-varying electromagnetic fields and waves.	7 71/	
B2B17EMPA	Electromagnetic Field	Z,ZK	5
-	dents acquinted with principles and applied electromagnetic field theory basics.		
B2B31EO1	Electronic Circuits 1	Z,ZK	4
	basic circuits with operational amplifiers, continues with the description of linear systems, analysis of their characteristics and fur	-	
	principles and features of circuits for generating signals and a controlled oscillator including the PLL circuit and its use. The la	st part of the cour	se is devoted to
basic amplifier stages w		7 71/	
B2B34ELPA	Electron Devices	Z,ZK	5
	the basic theory, principles of operation and properties of electron devices. Physical principles of operation, device structures models for small- and large-signal. Basic applications in analogue and digital electronics are examined. In seminars and labs		-
	ulation, measurement of device characteristics and extraction of device parameters. Operation of electron devices in electron		
the PSpice simulator.			analyzed using
B2B02FY1	Physics 1	Z,ZK	8
	ן vsics at the Faculty of Electrical Engineering - Physics 1, is devoted to the introduction into two important areas of physics. The	· · ·	-
	he electric and magnetic field. Within the framework of the classical mechanics, the students study the particle kinematics; dyna		
	gid bodies. The students should be able to solve basic problems dealing with the description of mechanical systems, which the		
	echanics is followed by the relativistic mechanics, electric and magnetic field - both stationary as well as non-stationary. The	-	-
	dy of electrical circuits, theory of electrotechnical materials or radioelectronics. Apart of this, the knowledge gained in this cou		0
consecutive course Phy			,
B2B02FY2	Physics 2	Z,ZK	7
	s closely linked with the course Physics 1. Within the framework of this course the students will first of all learn foundations of	, ,	Following topic
	will give to the students basic insight into the properties of waves and will help to the students to understand that the presente	-	
universal character in s	pite of the waves character. Particular types of waves, such as acoustic or optical waves are the subjects of the following sect	ion. Quantum me	chanics and
nuclear physics will con	nplete the student?s general education in physics. The knowledge gained in this course will help to the students in study of su	ich modern areas	as robotics,
computer vision, measu	Iring technique and will allow them to understand the principles of novel technologies and functioning of new electronic device	es.	
B0B01KANA	Complex Analysis	Z,ZK	4
The course is an introdu	uction to the fundamentals of complex analysis and its applications. The basic principles of Fourier, Laplace, and Z-transform	are explained, ind	luding their
applications, particularly	y to solving differential and difference equations.		
B0B01LAGA	Linear Algebra	Z,ZK	7
The course covers intro	ductory topics of linear algebra. It begins with fundamental concepts related to vector spaces and linear transform (such as line	ar dependence an	d independence
of vectors, bases, coord	linates of vectors, etc.). The next part of the course is devoted to matrix theory (determinants, inverse matrix, matrices of linea	r transformation,	eigenvalues and
eigenvectors). Application	ons include solving systems of linear equations, geometry in three-dimensional space (including dot and cross products), and	the singular value	e decomposition
of a matrix.			
B0B01MA1A	Mathematical Analysis 1	Z,ZK	6
This is an introductory of	course to differential and integral calculus of functions of one real variable.		
B0B01MA2A	Mathematical Analysis 2	Z,ZK	6
	ntroduction to the differential and integral calculus in several variables and basic relations between curve and surface integral	s. Other part cont	ains function
series and power series	s with application to Taylor and Fourier series.		
B2B34MIT	Microelectronics	KZ	4
	ar with the latest trends in the field of microelectronics. The course provide students with the microelectronic structures and to	echnologies of int	egrated circuits;
	o-electro-mechanical systems. The course introduces students to the design of nanoelectronics and integrated circuits.		
B2B99PPC	Practical C/C++ programming	KZ	6
	students to the C ++ and develops their practical skills in programming in C/C++ with an emphasis on solving computational task		
	ning. The first part of the course is devoted to the object-oriented programming in C++ and provides students with basic data c		•
	iples of parallel programming, multi-threaded applications, synchronization mechanisms and models of multi-threaded applicat		
	ic thinking to solve computational problems by searching the problem state space. Two main approaches are considered: the		
	ate space; and local optimization techniques. Additionally, students will be familiarized with models of arbitrary precision data	representations,	representation
of matrices, and matrix		1/7	4
B0B99PRPA	Procedural Programming	KZ	4
B2BPROJ6	Bachelor project	KZ	6
	e 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 spe	cified by branch d	epartment or
	e project will be defended within the framework of a subject.	7 71/	
B2B34SEE	Sesors in Electronics	Z,ZK	4
B2B37SAS	Signals and systems	Z,ZK	5
-	used on a description of continuous- and discrete-time signals and systems in time and frequency domains. The course also in	troduces the basi	c characteristics
	alog modulations and random signals.		
B0B01STP	Statistics and Probability	Z,ZK	5
	s to introduce students to the fundamentals of probability theory and mathematical statistics, their computational methods as	well as applicatio	IS OF THESE
mathematical tools to p		1/7	Α
B2B99TPS	Technical Writing > students with various technical or scientific reports (lab report, article, final thesis etc.) Also important is, in addition to langu	KZ	4 skills to show
	ent scientific information. Given are also up-to-date methods for efficient typing and document automation, including LaTeX. A	• •	
tasks in the Moodle.	sin coloring and documentation are also up to date methods for emolent typing and document automation, molduling LaTEA. A		issu sy rolateu

B2B17TBK Wireless Communication Technique	KZ	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, e	tc. 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	on 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 a	ny wireless comm	unication system					
or its components. Besides wireless system analysis, the lectures include review of physical backgrounds, survey of the most important existing radio s	stems together wi	th corresponding					
operational frequencies, description of electromagnetic wave propagation and related antennas. Instructions concerning propagation also cover bel	navior of EM wave	s in an urban					
environment or inside buildings. Lectures concerning analysis of typical wireless systems also cover description of related radio-frequency, microwa	ive 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.					
B2B32TSI Telecommunication Systems and Networks	KZ	4					
The course introduces principles and functions of digital telecommunications systems, both transmission and switching systems as well as converg	ed packet-oriented	d systems					
interconnected into universal telecommunication networks.							
B2B31ZEOA Fundamentals of Electric Circuits	Z,ZK	5					
The course describes the basic methods of analysis of electrical circuits. In the lectures, students are introduced to the basic active and passive circuit elements, circuit quantities,							
important circuit theorems and methods of circuit analysis in stationary and harmonic steady state as well as during transients caused by changes in the circuit. The seminars are aimed							
at practicing knowledge in the analysis of basic electrical circuits, supplemented by simulations and simple measurements.							
B2B14ZEK Fundamentals of electrotechnics	KZ	4					

## Code of the group: 2015\_BZAJ 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 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
B0B04B1K	English language B1 - classified assessment Markéta Havlí ková, Pavla Péterová, Erik Peter Stadnik, Michael Ynsua, Dana Saláková, Petra Juna Jennings <b>Petra Juna Jennings</b> Petra Juna Jennings (Gar.)	ΚZ	0	0C	Z,L	Ρ
B0B04B2Z	English language B2 - exam Markéta Havlí ková, Michael Ynsua, Dana Saláková, Petra Juna Jennings Petra Juna Jennings Petra Juna Jennings (Gar.)	Z,ZK	0	0C	Z,L	Ρ

#### Characteristics of the courses of this group of Study Plan: Code=2015\_BZAJ Name=Exam from the english language

B0B04B1K	English language B1 - classified assessment	KZ	0					
verifying of the student	s skills of B1 level	•						
B0B04B2Z	English language B2 - exam	Z,ZK	0					
I) The B2 English Exam is a compulsory subject for all Faculty of Electrical Engineering students at the Czech Technical University. According to the Study and Examination Rules and								
Regulations for Student	Regulations for Students at CTU (Part III, Article 4), a compulsory subject is one whose completion is a necessary condition in order to successfully complete the study programme. In							
addition, this requires the	ne passing of an examination evaluated on the scale A, B, C, D, or E (SERR Part III, Article 6). II) According to the Common F	European Framew	ork of Reference					
for Languages (CEFR),	an international standard for describing language ability, the definition of an English language learner who has achieved the	B2 (Upper-Intern	nediate) level is					
one who can understan	d the main ideas of complex text on both concrete and abstract topics, including technical discussions in his/her field of specia	lisation. Can inter	act with a degree					
	of fluency and spontaneity that makes regular interaction with native speakers quite possible without strain for either party. Can produce clear, detailed text on a wide range of subjects							
and explain a viewpoint on a topical issue giving the advantages and disadvantages of various options. III) Students who have successfully passed an approved international exam								
	within the past five years may present their certificate to the Department of Languages, Faculty of Electrical Engineering. Upon approval, students are then exempt from both the Written							
Test and the Oral Part.	For a list of approved international exams go the department website: http://jazyky.fel.cvut.cz/							

# Name of the block: Compulsory elective courses Minimal number of credits of the block: 20

The role of the block: PV

# Code of the group: 2018\_BEKPV

Name of the group: Compulsory subjects of the programme

Requirement credits in the group: In this group you have to gain at least 16 credits (at most 45) Requirement courses in the group: In this group you have to complete at least 4 courses (at most 11) Credits in the group: 16

Note on the group:

	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
B2B31EO2	Electronic Circuits 2 Ji í Hospodka Ji í Hospodka Ji í Hospodka (Gar.)	Z,ZK	4	2P+2L	Z	PV

	Microcontrollers					
B2B34MIK	Jan Novák, Tomáš Teplý, Vladimír Janí ek <b>Tomáš Teplý</b> Vladimír Janí ek (Gar.)	Z,ZK	4	2P+2C	Z	PV
B0B37NSI	Design of IoT systems Stanislav Vítek Stanislav Vítek (Gar.)	Z,ZK	5	2P + 2L + 2D	L	PV
B2B17OKS	<b>Optical Communication Systems</b> Stanislav Zvánovec, Jan Šístek, Mat j Komanec <b>Mat j Komanec</b> Stanislav Zvánovec (Gar.)	Z,ZK	4	2P+2C	Z	PV
B2B34OZD	<b>Optical sources and detectors of radiation</b> Tomáš Martan, Václav Prajzler, Vít zslav Je ábek, David Mareš <b>Václav</b> <b>Prajzler</b> Václav Prajzler (Gar.)	Z,ZK	4	2P+2L	L	PV
B2B32PPS	Network Planning and Operation Ji í Hole ek, Ji í Vodrážka <b>Ji í Hole ek</b> Ji í Vodrážka (Gar.)	Z,ZK	4	2P + 2C	L	PV
B2B37ROZ	Radio Circuits and Devices Josef Dobeš, Karel Ulovec Karel Ulovec Josef Dobeš (Gar.)	Z,ZK	4	2P+2L	L	PV
B2B32STE	Network Technologies Leoš Bohá , Petr Hampl, Ivan Pravda Ivan Pravda Leoš Bohá (Gar.)	Z,ZK	4	2P + 2C	Z	PV
B0B02UAK	Introduction to Acoustic Marek Brothánek, Ond ej Ji í ek Ond ej Ji í ek (Gar.)	KZ	4	2P+2L	L	PV
B2B17VDP	Transmission Lines for Data Transfer Ladislav Oppl, Milan Polívka Milan Polívka Milan Polívka (Gar.)	Z,ZK	4	2P+2L	L	PV
B2B37ZST	Principles of Studio Technology František Rund, Jan Bedná, Martin Bernas Jan Bedná František Rund (Gar.)	Z,ZK	4	2P+2L	Z	PV
haracteristics of the	e courses of this group of Study Plan: Code=2018_BEKPV Nam	e=Compuls	ory subj	ects of the	prograr	nme
B2B31EO2 El	ectronic Circuits 2			Z	ZK	4
The course builds on the ba	sic electric circuits course. It introduces multistage transistor amplifiers and basic applic	ations in the fiel	d of electro	nic systems. S	Students be	come famili
with design and measureme	ent of electronic systems, including nonlinear applications with regard to the real charac	teristics of opera	ational amp	lifiers. Next op	erating prin	ciples and
parameters of power amplif	iers, linear stabilizers, switching power supply and D/A and A/D converters are presents					
B2B34MIK Mi	crocontrollers			Z	,ZK	4
The goal of this course is to	make students acquainted with recent interesting applications, smart sensors circuits a	nd peripherals h	nandled by			students wil
program their own application	ons and measure actual properties. Because of usage of a programming language C it v	vill be possible t	o focus on	the practical p	art of the re	alization.
B0B37NSI De	esign of IoT systems			Z	,ZK	5
	otical Communication Systems				ZK	4
	introduce students with principles of optical systems. The course covers both theoretical	background of	optics and	1		
	xtend their knowledge from the ray optics through the matrix optics, subsequently and fu					
	optics. Then students will learn the basic mechanisms and principles of fiber optics.	and by the dec		optiour oyoton	o doing ou	
				7	.ZK	4
	Dtical sources and detectors of radiation explain the principle of optical sources, optical amplifiers and photodetectors and their to	choology Thoo	discuss the	1	' I	
	circuits, both from a theoretical and a broader application point of view. Attention is also					
8 i 8	uantities, important measuring and diagnostic methods are given.	paid to compon				o componei
	etwork Planning and Operation			7	ZK	4
	edge obtained in precedent studies on such issues as network planning, network desigr	notwork const	ructions on			-
	is are developed in model tasks focused on the design of selected parts of the telecomm					-
	the business aspects of telecommunications.	iunications netw	In Specie			legislation
				7	71/	1
	adio Circuits and Devices				,ZK	. 4
	bic but systematical description of fundamental types of analog and digital modulations. A					
	eivers follows. A description of passive and active elements with non-distributed and dis			-		-
	evoted to contemporary structures with distributed parameters, microwave transistors of		-		-	
	ental part of the subject: radio-frequency amplifiers and their noise properties, distribute ind multiply-balanced mixers.	a ampliners, pov	ver amplifie	สร, บริษาเสียารี,	Puase nois	e, u ysiai
					74	Л
	etwork Technologies	wt of Data Music	orko -: ' '		,ZK	4
	ject is to move further already acquired fundamental networking knowledge in the conte		-			-
	ds to access common shared physical media, Ethernet switching technologies and WiFi			-		
	n real practice. Students will be given a chance to get in touch with technology to impler	nent simple rout	eu and SWI	uneu network	s in the univ	ersity netw
lab.					<u></u>	<u> </u>
I	troduction to Acoustic			1	<z td=""  <=""><td>4</td></z>	4
	ew of main parts of acoustics. In first lectures there is introduction to basic types of sour		-	-	-	
ntroduction to building and	room acoustics. The second half of the course deals with introductions to physiological	acoustics, psych	oacoustics	, musical acou	istics, hygie	ne legislat
•						
and ultrasound, infrasound						
and ultrasound, infrasound	and their measurement. ansmission Lines for Data Transfer			Z	,ZK	4

B2B37ZST Principles of Studio Technology The course gives basic knowledge of elements and systems used in television and radio professional and semiprofessional studio technology and of technology of radio and television production and broadcasting. Laboratory exercises are situated in a small school studio and are completed with professional excursions.

## Code of the group: 2018\_BEKP2

Name of the group: Compulsory subjects of the programme

Requirement credits in the group: In this group you have to gain at least 4 credits (at most 8) Requirement courses in the group: In this group you have to complete at least 1 course (at most 2) Credits in the group: 4

Z,ZK

4

## 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
B2B16EPO	Business economics Old ich Starý, Josef ernohous, Blanka Ku erková Josef ernohous Old ich Starý (Gar.)	КZ	4	2P+2S	Z	PV
B2B99EKP	Electronics and communication practically Vladimír Janí ek Vladimír Janí ek (Gar.)	KZ	4	2P+2L	Z	PV

#### Characteristics of the courses of this group of Study Plan: Code=2018\_BEKP2 Name=Compulsory subjects of the programme

B2B16EPO	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.							
B2B99EKP	Electronics and communication practically	KZ	4				
The course is devoted t	o practical experiments with the ESP 32 SoC board and a set of external add-on modules. Students will get acquainted with	the rules of applic	ation design in				
ArduinoIDE and Visual	Code Studio using libraries for operating internal and external peripherals. Sample applications are focused on standardized	issues that cover	the professional				
focus of the Electronics and Communications program. Part of the exercise will be devoted to the description of the design of printed circuit boards, their production and mounting.							
Students will get a boar	Students will get a board with SoC ESP32 for experimentation, which they can also use for home preparation.						

## Name of the block: Elective courses Minimal number of credits of the block: 0 The role of the block: V

Code of the group: 2015\_BJKA Name of the group: English language courses 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
B0B04A21	English Language A2-1 Dana Saláková	Z		2s	Z	V
B0B04A22	English Language A2-2 Dana Saláková	Z	0	2s	L	V
B0B04B11	English Language B1-1 Petra Juna Jennings Petra Juna Jennings (Gar.)	Z	0	2C	Z	V
B0B04B12	English Language B1-2 Petra Juna Jennings Petra Juna Jennings (Gar.)	Z	0	2C	L	V
B0B04B21	English Language B2-1 Petra Juna Jennings Petra Juna Jennings (Gar.)	Z	3	2C	Z	V
B0B04B22	English Language B2-2 Petra Juna Jennings Petra Juna Jennings (Gar.)	Z	3	2C	Z,L	V

### Characteristics of the courses of this group of Study Plan: Code=2015\_BJKA Name=English language courses

onal actor lotico ol	the bearede of this group of orday I fam. bodd=2010_Boror Hand=English language board				
B0B04A21	English Language A2-1	Z			
The course is open to s	udents who are beginners in their second language. Course objective: Achieving competence in basic English.				
B0B04A22	English Language A2-2	Z	0		
The course is open to s	The course is open to students who are beginners in their second foreign language. The course objective is to develop and sustain their basic knowledge of the English language.				
B0B04B11	English Language B1-1	Z	0		
Course objective: Broad	ening the basic knowledge of general English; mastering basic specialised language; focusing on text analysis and vocabulary	expansion; under	standing spoken		
English.					
B0B04B12	English Language B1-2	Z	0		
Course objective: Broad	ening the basic knowledge of general English; mastering basic specialised language; focusing on text analysis and vocabulary	expansion; under	standing spoken		
Engligh					
English.					
B0B04B21	English Language B2-1	Z	3		
B0B04B21	English Language B2-1 as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk	Z B2 - zkouška - B0	•		
B0B04B21 This course is designed			B04B2Z*). While		
B0B04B21 This course is designed the course is focused or academic and technical	as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk	<), it also focuses	B04B2Z*). While more on the		
B0B04B21 This course is designed the course is focused of	as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk n helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark	<), it also focuses	B04B2Z*). While more on the		
B0B04B21 This course is designed the course is focused or academic and technical	as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk n helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark	<), it also focuses	B04B2Z*). While more on the		
B0B04B21 This course is designed the course is focused of academic and technical / International Study. B0B04B22	as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appro	<), it also focuses priate level of Eng Z	B04B2Z*). While more on the plish for Erasmus		
B0B04B21 This course is designed the course is focused of academic and technical / International Study. B0B04B22 This course is designed	as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appro English Language B2-2	<), it also focuses priate level of Eng Z 32 - zkouška - B08	B04B2Z*). While more on the glish for Erasmus 3 304B2Z *). While		
B0B04B21 This course is designed the course is focused of academic and technical / International Study. B0B04B22 This course is designed the course is focused of	as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appro English Language B2-2 as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk E	<), it also focuses priate level of Eng Z 32 - zkouška - BOB <), it also focuses	B04B2Z*). While more on the Jlish for Erasmus 3 304B2Z *). While more on the		
B0B04B21 This course is designed the course is focused of academic and technical / International Study. B0B04B22 This course is designed the course is focused of	as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk b) helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appro English Language B2-2 as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk E helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark	<), it also focuses priate level of Eng Z 32 - zkouška - BOB <), it also focuses	B04B2Z*). While more on the Jlish for Erasmus 3 304B2Z *). While more on the		

## Code of the group: BTV Name of the group: Physical education 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 Ji í Drnek	Z	2	0+2	L,Z	V
TV-V1	Physical education	Z	1	0+2	Z,L	V
TVV0	Physical education	Z	0	0+2	Z,L	V

#### Characteristics of the courses of this group of Study Plan: Code=BTV Name=Physical education

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

## Code of the group: BTVK

Name of the group: Physical education courses

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
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=Physical education courses

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

Code of the group: 2018\_BEKVOL 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\\

Code	Name of the course	Completion	Credits			
A003TV	Physical Education	Z	2			
B0B01DRN	Differencial Equations and Numerical Analysis	Z,ZK	4			
This course introdu	ces students to the classical theory of ordinary differential equations (separable and linear ODEs) and also to bsics of numerical meth	ods (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 poi	nt of view.			
B0B01KANA	Complex Analysis	Z,ZK	4			
The course is an	The course is an introduction to the fundamentals of complex analysis and its applications. The basic principles of Fourier, Laplace, and Z-transform are explained, including their					
	applications, particularly to solving differential and difference equations.					

List of courses of this pass:

B0B01LAGA		Z,ZK	7
1	Linear Algebra		
	ntroductory topics of linear algebra. It begins with fundamental concepts related to vector spaces and linear transform (such as linear de		
	oordinates of vectors, etc.). The next part of the course is devoted to matrix theory (determinants, inverse matrix, matrices of linear tra	-	
igenvectors). Appli	ications include solving systems of linear equations, geometry in three-dimensional space (including dot and cross products), and the of a matrix.	singular value de	ecompositi
B0B01MA1A	Mathematical Analysis 1 This is an introductory course to differential and integral calculus of functions of one real variable.	Z,ZK	6
B0B01MA2A	Mathematical Analysis 2	Z,ZK	6
			-
The subject covers	s 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.	Other part conta	Ins function
B0B01STP	Statistics and Probability	Z,ZK	5
	purse is to introduce students to the fundamentals of probability theory and mathematical statistics, their computational methods as w		-
	mathematical tools to practical examples.		
B0B02UAK	Introduction to Acoustic	KZ	4
	rides overview of main parts of acoustics. In first lectures there is introduction to basic types of sound fields, its solutions and propertie		
	ding and room acoustics. The second half of the course deals with introductions to physiological acoustics, psychoacoustics, musical	-	
	and ultrasound, infrasound and their measurement.		Ū
B0B04A21	English Language A2-1	Z	
	The course is open to students who are beginners in their second language. Course objective: Achieving competence in basic Er	iglish.	I
B0B04A22	English Language A2-2	7	0
1	en to students who are beginners in their second foreign language. The course objective is to develop and sustain their basic knowled	—	-
B0B04B11	English Language B1-1	<u> </u>	0
1	roadening the basic knowledge of general English; mastering basic specialised language; focusing on text analysis and vocabulary expa	ansion; understa	-
	English.	,	5 5
B0B04B12	English Language B1-2	Z	0
1	roadening the basic knowledge of general English; mastering basic specialised language; focusing on text analysis and vocabulary expa	_	-
	English.	,	3 50 51
B0B04B1K	English language B1 - classified assessment	KZ	0
	verifying of the student's skills of B1 level		1 0
	English Language B2-1		
B0B04B21		7	3
B0B04B21 his course is desig		Z zkouška - B0B04	3 IB2Z*). Wh
his course is desig	gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 -	zkouška - B0B04	B2Z*). Wł
his course is desig the course is focu		zkouška - B0B04 it also focuses n	B2Z*). When the
his course is desig the course is focu	gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark),	zkouška - B0B04 it also focuses n	B2Z*). Wh
his course is desig the course is focu cademic and techr	gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriat / International Study.	zkouška - B0B04 it also focuses n	B2Z*). Wh
his course is design the course is focu cademic and techr B0B04B22	gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - ised on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriat	zkouška - B0B04 it also focuses n e level of English Z	B2Z*). When ore on the ore for Erasm
his course is desig the course is focu cademic and techr B0B04B22 his course is desig	gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2- used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriat / International Study. English Language B2-2	zkouška - B0B04 it also focuses n e level of English Z :kouška - B0B04	B2Z*). Wr nore on the for Erasm 3 B2Z *). Wr
his course is desig the course is focu cademic and techr B0B04B22 his course is desig the course is focu	gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriat / International Study. English Language B2-2 gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - 2	zkouška - B0B04 it also focuses n e level of English Z zkouška - B0B04 it also focuses n	B2Z*). Wr hore on the hor Erasm B2Z *). Wr hore on the
his course is desig the course is focu cademic and techr B0B04B22 his course is desig the course is focu	gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriat / International Study. English Language B2-2 gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - z used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark),	zkouška - B0B04 it also focuses n e level of English Z zkouška - B0B04 it also focuses n	B2Z*). Wr hore on the hor Erasm B2Z *). Wr hore on the
his course is desig the course is focu cademic and techr B0B04B22 his course is desig the course is focu	gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriat / International Study. English Language B2-2 gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - z used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriat used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriat	zkouška - B0B04 it also focuses n e level of English Z zkouška - B0B04 it also focuses n	B2Z*). Wh hore on the for Erasm B2Z *). Wh hore on the
his course is desig the course is focu cademic and techr B0B04B22 his course is desig the course is focu cademic and techr B0B04B22 The B2 English E	gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriat / International Study. English Language B2-2 gned as a full-year, two semester preparation course for the university scompulsory B2-level English Examination (Anglický jazyk B2 - z used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriat used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriat / International Study. English language B2 - exam xam is a compulsory subject for all Faculty of Electrical Engineering students at the Czech Technical University. According to the Stud	zkouška - B0B04 it also focuses n e level of English Z zkouška - B0B04 it also focuses n e level of English Z,ZK y and Examinatii	B2Z*). Wr nore on the for Erasm B2Z *). Wr nore on the for Erasm 0 on Rules a
his course is designed the course is focu- cademic and techr B0B04B22 his course is designed the course is focu- cademic and techr B0B04B22 The B2 English E egulations for Stud	and as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - sed on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriat / International Study. English Language B2-2 gned as a full-year, two semester preparation course for the university scompulsory B2-level English Examination (Anglický jazyk B2 - z used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriat / International Study. International Study. English Ianguage B2 - exam xam is a compulsory subject for all Faculty of Electrical Engineering students at the Czech Technical University. According to the Stud dents at CTU (Part III, Article 4), a compulsory subject is one whose completion is a necessary condition in order to successfully completed is a necessary condition in order to successfully completed is a necessary condition in order to successfully completed is a necessary condition in order to successfully completed is a necessary condition in order to successfully completed is a necessary condition in order to successfully completed is a necessary condition in order to successfully completed is a necessary condition in order to successfully completed is a necessary condition in order to successfully completed is a necessary condition in order to successfully completed is a necessary condition in order to successfully completed is a necessary condition in order to successfully completed is a necessary condition in order to successfully completed is a necessary condition in order to successfully completed is a necessary condition in order to successfully completed is a	zkouška - B0B04 it also focuses n e level of English Z zkouška - B0B04 it also focuses n e level of English Z,ZK y and Examinatio olete the study p	B2Z*). When ore on the ore on the ore on the ore constant of the ore on the ore on the ore on the ore or the ore or the ore or the ore ore ore ore ore ore ore ore ore or
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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.		,
B2B02FY2	Physics 2	Z,ZK	7
	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 the es - will give to the students basic insight into the properties of waves and will help to the students to understand that the presented of		• •
	er in spite of the waves character. Particular types of waves, such as acoustic or optical waves are the subjects of the following section		
	vill complete the student?s general education in physics. The knowledge gained in this course will help to the students in study of suc		s robotics,
B2B14ZEK	nputer vision, measuring technique and will allow them to understand the principles of novel technologies and functioning of new electrostand and the principles of new electrostand technologies and functioning and functing and functioning		4
B2B14ZEK B2B16EPO	Fundamentals of electrotechnics Business economics	KZ KZ	4
1	Business Economics deals with the subject from wide angle of view, discussing all particular aspects of Business Economics, and re	I I	
B2B17ELD	Electrodynamics	Z,ZK	4
	This subject empowers its students with a unified approach to time-varying electromagnetic fields and waves.		_
B2B17EMPA	Electromagnetic Field This course gets its students acquinted with principles and applied electromagnetic field theory basics.	Z,ZK	5
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 udents extend their knowledge from the ray optics through the matrix optics, subsequently and further by the description of optical sy		
optiour oyotomo. Ott	towards wave and quantum optics. Then students will learn the basic mechanisms and principles of fiber optics.	clothe doing Cauce	sian boarno,
B2B17TBK	Wireless Communication Technique	KZ	4
	cations belong to the fastest developing technical fields. Besides widely used mobile telephony systems, this field also includes many of		
	tems. Different types of radio modems are also built in the majority of electronic devices like PCs, tablets, notebooks, cameras, etc. W s, operation of billions of wireless sensors is expected. The subject is common to all students of the Electronics and Communication st		
	tant aspects of this technical branch. Obtained knowledge should enable the students to design, project, adjust or manufacture any w		
-	Besides wireless system analysis, the lectures include review of physical backgrounds, survey of the most important existing radio system	-	
	encies, description of electromagnetic wave propagation and related antennas. Instructions concerning propagation also cover behaven nside buildings. Lectures concerning analysis of typical wireless systems also cover description of related radio-frequency, microwaven source and the system set of th		
	ises include practical calculations of wireless systems, computer analysis and synthesis of important structures and circuits, and rela		
B2B17VDP	Transmission Lines for Data Transfer	Z,ZK	4
B2B31CZS	Digital Signal processing	Z,ZK	4
	overview about basic methods of digital signal processing and their applications (examples from speech and biological signal proces haracteristics in time and frequency domain, Fourier transform, fast algorithms for DFT computation, introduction to digital filter desig		-
-,,,,,,,,,,,,,,,,,,	frequency domain, decimation and interpolation and their usage in filter banks, basics of LPC analysis. Further details can be four		
	href=http://noel.feld.cvut.cz/vyu/ae2m99czs>http://noel.feld.cvut.cz/vyu/ae2m99czs		
B2B31EO1	Electronic Circuits 1 ces basic circuits with operational amplifiers, continues with the description of linear systems, analysis of their characteristics and funda	Z,ZK	4 s froquency
	the principles and features of circuits for generating signals and a controlled oscillator including the PLL circuit and its use. The last p basic amplifier stages with transistors.	-	
B2B31EO2	Electronic Circuits 2	Z,ZK	4
1	on the basic electric circuits course. It introduces multistage transistor amplifiers and basic applications in the field of electronic syste	· · ·	me familiar
with design and n	neasurement of electronic systems, including nonlinear applications with regard to the real characteristics of operational amplifiers. I parameters of power amplifiers, linear stabilizers, switching power supply and D/A and A/D converters are presents.	lext operating princ	ciples and
B2B31ZEOA	Fundamentals of Electric Circuits	Z,ZK	5
	ibes the basic methods of analysis of electrical circuits. In the lectures, students are introduced to the basic active and passive circuit		
important circuit the	arems and methods of circuit analysis in stationary and harmonic steady state as well as during transients caused by changes in the at practicing knowledge in the analysis of basic electrical circuits, supplemented by simulations and simple measurements		s are aimed
B2B32DATA	Data Networks	KZ	5
	ces students with the fundamentals of data communication networks. The course objective is to provide broader understanding of va bes of data networks based on the layered OSI model. The course also provides students with fundamental understanding of TCP/IP		
	the Internet era of networking, including practical experience with the data networks in laboratory.	protocor larning do	
B2B32DITA	Digital Technique	KZ	4
-	urse is to provide the introduction into designing and realization of digital circuits. First, necessary mathematical apparatus, such as the and realization of logical functions is presented, followed by brief introduction into basics of logical circuits, such as the logical gates,	-	- 1
•	rt is dedicated mainly to modern designing techniques of digital circuits using programmable FPGA and VHDL language. During these		°
	rous examples are evaluated to provide a complex insight into this hardware description language and modern methods of designing a		
B2B32PPS	Network Planning and Operation	Z,ZK	4
	ands knowledge obtained in precedent studies on such issues as network planning, network design, network constructions and netw is systems are developed in model tasks focused on the design of selected parts of the telecommunications network. Special attention and the telecommunications network.		-
	telecommunications and to the business aspects of telecommunications.	shi is given to the le	gisiation in
B2B32STE	Network Technologies	Z,ZK	4
	of this subject is to move further already acquired fundamental networking knowledge in the context of Data Networks subject. Stude		- 1
	us methods to access common shared physical media, Ethernet switching technologies and WiFi networks and last but not least the as used in real practice. Students will be given a chance to get in touch with technology to implement simple routed and switched net		
	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 interconnected into universal telecommunication networks.	ed packet-oriented	systems
B2B34ELPA	Electron Devices	Z,ZK	5
This course introdu	ces the basic theory, principles of operation and properties of electron devices. Physical principles of operation, device structures an	d characteristics ar	e explained
	uate models for small- and large-signal. Basic applications in analogue and digital electronics are examined. In seminars and labs, st e simulation, measurement of device characteristics and extraction of device parameters. Operation of electron devices in electronic of		
principles of device	the PSpice simulator.	and is until alla	., 200 using
	•		

B2B34MIK	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.			
B2B34MIT	Microelectronics	KZ	4
Students become f	amiliar with the latest trends in the field of microelectronics. The course provide students with the microelectronic structures and tech	nologies of integra	ted circuits;
micro sensors and micro-electro-mechanical systems. The course introduces students to the design of nanoelectronics and integrated circuits.			
B2B34OZD	Optical sources and detectors of radiation	Z,ZK	4
	ourse is to explain the principle of optical sources, optical amplifiers and photodetectors and their technology. Then discuss their use		
including optical int	egrated circuits, both from a theoretical and a broader application point of view. Attention is also paid to components for optical comn	nunication and to c	components
	for physical and chemical quantities, important measuring and diagnostic methods are given.		
B2B34SEE	Sesors in Electronics	Z,ZK	4
B2B37AVT	Audiovisual Technology	KZ	4
	ntroduction to multimedia technology (audio and video). It overviews sound and picture acquisition, signal processing, transmission a		-
-	ion including physiology of hearing and vision. It provides fundamental information for understanding the main principles for system s		1
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		
and basic types of radio receivers follows. A description of passive and active elements with non-distributed and distributed parameters follows from the point of view their usage in			
radio circuits. Attention is devoted to contemporary structures with distributed parameters, microwave transistors of various types, power unipolar transistors. A description of radio			
function blocks is a fundamental part of the subject: radio-frequency amplifiers and their noise properties, distributed amplifiers, power amplifiers, oscillators, phase noise, crystal oscillators, mixers, double and multiply-balanced mixers.			
B2B37SAS	Signals and systems	Z,ZK	5
	focused on a description of continuous- and discrete-time signals and systems in time and frequency domains. The course also introd	I ' I	-
	of bandpass signals, analog modulations and random signals.		aracteristics
B2B37ZST	Principles of Studio Technology	Z,ZK	4
	asic knowledge of elements and systems used in television and radio professional and semiprofessional studio technology and of tech		-
	production and broadcasting. Laboratory exercises are situated in a small school studio and are completed with professional excl		
B2B38EMB	Electrical Measurements	Z,ZK	4
	Irement of electrical quantities (voltage, current, power, frequency, resistance, capacitance, and inductance) are explained together v	I ' I	
	curacy estimation. The course is closed by presenting information on several basic electronic measuring instruments and explaining t		
measurements and basic information concerning measurement systems.			
B2B99EKP	Electronics and communication practically	KZ	4
	ted to practical experiments with the ESP 32 SoC board and a set of external add-on modules. Students will get acquainted with the		
ArduinoIDE and Visual Code Studio using libraries for operating internal and external peripherals. Sample applications are focused on standardized issues that cover the professional			
focus of the Electronics and Communications program. Part of the exercise will be devoted to the description of the design of printed circuit boards, their production and mounting.			
Students will get a board with SoC ESP32 for experimentation, which they can also use for home preparation.			
B2B99PPC	Practical C/C++ programming		
The course introduc		KZ	6
	es students to the C++ and develops their practical skills in programming in C/C++ with an emphasis on solving computational tasks a	· · · –	-
using parallel progr	amming. The first part of the course is devoted to the object-oriented programming in C++ and provides students with basic data cont	ainers of standard	applications library STL.
using parallel progr Students learn the p	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	ind multi-threaded a ainers of standard s. The second part i	applications library STL. is dedicated
using parallel progr Students learn the p to develop an algo	amming. The first part of the course is devoted to the object-oriented programming in C++ and provides students with basic data cont orinciples 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	nd multi-threaded a ainers of standard s. The second part i eterministic search	applications library STL. is dedicated of a graph
using parallel progr Students learn the p to develop an algo	amming. The first part of the course is devoted to the object-oriented programming in C++ and provides students with basic data cont orinciples 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	nd multi-threaded a ainers of standard s. The second part i eterministic search	applications library STL. is dedicated of a graph
using parallel progr Students learn the p to develop an algo representation of t	amming. The first part of the course is devoted to the object-oriented programming in C++ and provides students with basic data contr orinciples 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- of matrices, and matrix calculations.	nd multi-threaded ainers of standard s. The second part i eterministic search presentations, repr	applications library STL. is dedicated of a graph
using parallel progr Students learn the p to develop an algo representation of t B2B99TPS	amming. The first part of the course is devoted to the object-oriented programming in C++ and provides students with basic data contr orinciples 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 rep of matrices, and matrix calculations. Technical Writing	nd multi-threaded ainers of standard s. The second part i eterministic search presentations, repr	applications library STL. is dedicated of a graph resentation 4
using parallel progr Students learn the p to develop an algo representation of t B2B99TPS The course aims t	amming. The first part of the course is devoted to the object-oriented programming in C++ and provides students with basic data contr orinciples 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 the state space; and local optimization techniques. Additionally, students will be familiarized with models of arbitrary precision data re- of matrices, and matrix calculations. Technical Writing o help students with various technical or scientific reports (lab report, article, final thesis etc.) Also important is, in addition to language	nd multi-threaded a ainers of standard s. The second part i eterministic search presentations, repr KZ ge and stylistic skill	applications library STL. is dedicated of a graph resentation 4 Is, to show
using parallel progr Students learn the p to develop an algo representation of t B2B99TPS The course aims t	amming. The first part of the course is devoted to the object-oriented programming in C++ and provides students with basic data contr orinciples 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 the state space; and local optimization techniques. Additionally, students will be familiarized with models of arbitrary precision data re of matrices, and matrix calculations. Technical Writing 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 to	nd multi-threaded a ainers of standard s. The second part i eterministic search presentations, repr KZ ge and stylistic skill	applications library STL. is dedicated of a graph resentation 4 Is, to show
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