# 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

BBAP20 Bachelor thesis

## 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 <b>Radek Havlí ek</b> 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

BEZB	Safety in Electrical Engineering for a bachelor's degree	Z	0
The purpose of the safe	ty course is to give the students basic knowledge of electrical equipment and installation as to avoid danger arising from oper-	ation of it. This intr	oductory course
contains fundamentals	of Safety Electrical Engineering. In this way the students receive qualification of instructed person that enables them to work	on electrical equi	oment.
BEZZ	Basic health and occupational safety regulations	Z	0
The guidelines were wo	rked out based on The Training Scheme for Health and Occupational Safety designed for employees and students of the Cze	ch Technical Univ	ersity in Prague,
which was provided by t	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 Occu	pational Safety
regulations forms an int	egral 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 <b>Karel</b> Fliegel Petr Páta (Gar.)	КZ	4	2P+2L	L	Ρ
B2B31CZS	Digital Signal processing Petr Pollák, Petr Krýže Pavel Sovka Pavel Sovka (Gar.)	Z,ZK	4	2P+2C	Z	Ρ
B2B32DATA	Data Networks 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, Daniel Gromada, Josef Dvo ák, Karel Pospíšil Petr Habala Petr Habala (Gar.)	Z,ZK	4	2P+2C	L	Ρ
B2B32DITA	Digital Technique Pavel Lafata, Tomáš Zeman <b>Pavel Lafata</b> Pavel Lafata (Gar.)	KZ	4	2P + 2L	Z	Ρ
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>	Z,ZK	4	2P+2C	L	Р
B2B17EMPA	Zbyn k Škvor (Gar.) Electromagnetic Field	Z,ZK	5	2P+2C	Z	Р
B2B31EO1	Vít zslav Pankrác Vít zslav Pankrác (Gar.)           Electronic Circuits 1           Ji í Hospodka, Tomáš Kouba, Jan Havlík Ji í Hospodka Ji í Hospodka	Z,ZK	4	2P+2L	L	Р
B2B34ELPA	(Gar.) Electron Devices Pavel Hazdra, Jan Novák, Tomáš Teplý, Vít Záhlava Pavel Hazdra Pavel Hazdra (Car.)	Z,ZK	5	2P+2L	Z	Р
B2B02FY1	Hazdra (Gar.) Physics 1 Petr Kulhánek, Petr Koní ek <b>Petr Kulhánek</b> Petr Kulhánek (Gar.)	Z,ZK	8	4P+1L+2C	L	P
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, Martin Bohata Martin Bohata Martin Bohata (Gar.)	Z,ZK	4	2P+2S	Z	Р
B0B01LAGA	Linear Algebra Daniel Gromada, Josef Dvo ák, Ji í Velebil, Natalie Žukovec, Mat j Dostál <b>Ji í</b> Velebil Ji í Velebil (Gar.)	Z,ZK	7	4P+2S	Z	Р
B0B01MA1A	Mathematical Analysis 1 Josef Dvo ák, Karel Pospíšil, Veronika Sobotíková Veronika Sobotíková Veronika Sobotíková (Gar.)	Z,ZK	6	4P+2S	Z	Р
B0B01MA2A	Mathematical Analysis 2 Karel Pospiśil, Zden k Mihula, Martin Bohata, Veronika Sobotíková, Jaroslav Tišer, Martin K epela Jaroslav Tišer Petr Hájek (Gar.)	Z,ZK	6	4P+2S	L	Р
B2B34MIT	Microelectronics Jan Novák, Tomáš Teplý, Vladimír Janí ek, Ji í Jakovenko, Vít zslav Je ábek Ji í Jakovenko Ji í Jakovenko (Gar.)	ΚZ	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.)	KZ	6	4s	Z,L	Р
B2B34SEE	Sesors in Electronics Miroslav Husák, Tomáš Teplý, Adam Bou a, Alexandr Laposa 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 Kate ina Helisová, Jakub Stan k, Miroslav Korbelá, 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 P emysl Hudec 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
B2B15UELA	Introduction to Electrical Engineering Zden k Müller, Pavel Hrzina Pavel Hrzina Zden k Müller (Gar.)	KZ	4	2P+1L	Z	P
B2B31ZEOA	Fundamentals of Electric Circuits Roman mejla, Pavel Máša Roman mejla Roman mejla (Gar.)	Z,ZK	5	2P+2L	L	Р
Characteristics of th	Roman mejla, Pavel Máša Roman mejla Roman mejla (Gar.) Re courses of this group of Study Plan: Code=2018_BEKP Name= udiovisual Technology			cts of the		
	tion to multimedia technology (audio and video). It overviews sound and picture acquisition siology of hearing and vision. It provides fundamental information for understanding the r		-			ecording and
The subject gives overview systems, signal characteris	igital Signal processing about basic methods of digital signal processing and their applications (examples from s stics in time and frequency domain, Fourier transform, fast algorithms for DFT computation tion and interpolation and their usage in filter banks, basics of LPC analysis. Further deta	on, introduction t	to digital filt	al processing)		-
	z/vyu/ae2m99czs>http://noel.feld.cvut.cz/vyu/ae2m99czs				KZ	5
The course introduces stud used in specific types of da	dents with the fundamentals of data communication networks. The course objective is to ata networks based on the layered OSI model. The course also provides students with fur			ding of various	s communica	tion protocol
B0B01DRN D	ing, including practical experience with the data networks in laboratory. ifferencial Equations and Numerical Analysis				,ZK	4
This course introduces stud stability, numerical solution	dents to the classical theory of ordinary differential equations (separable and linear ODEs is of algebraic and differential equations and their systems). The course takes advantage			heoretical and	l practical po	int of view.
The goal of this course is to maps, minimization and rea etc. The second part is dec	igital Technique o provide the introduction into designing and realization of digital circuits. First, necessary alization of logical functions is presented, followed by brief introduction into basics of logic dicated mainly to modern designing techniques of digital circuits using programmable FP4 amples are evaluated to provide a complex insight into this hardware description language	al circuits, such GA and VHDL la	as the logic anguage. D	such as the B al gates, flip-f uring these le	lops, TTL and ssons, the ba	d CMOS logic asics of VHDL

Methods of measurement of electrical sparatiles (bulges, carlot passe), flegarency, carlot data, et al. explored together with protecting of bein correctly in any electronic and explored together with protecting of bein correctly in any electronic and explored together.	B2B38EMB	Electrical Measurements	Z,ZK	4
mesurements and basic information containing mesurements systems.           BEDITELD         Decircordynamics         Z.ZK         4           The outper engowers its auders with a unified appoorts to inner-waying decompare feels and waves.         Z.ZK         4           EDITELDA         Z.ZK         5           The outper engowers its auders with a unified appoorts to inner-waying decompare feels and waves.         Z.ZK         5           EDITELDA         Z.ZK         5         Z.ZK         5           EDITELDA         ELECTOND process         Transition and process and process and process and process and process and proces and process and process and process and process and				
B2B1FLD         [Electrodynamics         Z.2K         4           B2B1FLD         [Electromagnetic Field         Z.2K         5           B2B1FLDM         [Electromagnetic Field         Z.2K         5           B2B1FLDM         [Electromagnetic Field         Z.2K         5           B2B1FLDM         [Electrom Circuits 1         Z.2K         5           B2B3FLDM         [Electrom Circuits 1         Z.2K         8           B2B3FLDM         [Electrom Circuits 1         Z.2K         8           B2B3FLDM         [Electrom Circuits 2         2.2K         8           B2B3FLTM         B2B3FLDM         [Electrom Circuits 2         2.2K         8           B2B3FLTM         Baseling endition single and the standard and the st			g the fundamenta	als of magnetic
This subject angewates is stated with university and explose discretionargenetic fuelds and wates.           BESTERMAN         Electronargenetic Field         ZZK         5           The course groups and stated and explose discretionargenetic fuelt theory basics.         ZZK         4           BESTERMAN         Electronic Crucius 1         ZZK         5           The course information with personal and personal and properties of description of theory basics.         ZZK         5           BESTERMAN         Electronic Crucius 1         ZZK         5 <td></td> <td></td> <td>774</td> <td>1</td>			774	1
B2B1FEMPA         Electromagnetic Field         Z.ZK         5           B2B31FEO1         Electronic Circuits 1         Z.ZK         4           B2B31EO1         Electronic Circuits 1         Circuits 4         5           B2B31EO1         Electronic Circuits 1         Circuits 4         5           B2B31EO1         Electronic Circuits 1         Circuits 4         5           B2B31EO1         Electronic Circuits 4         5         2         5           B2B31EO1         Electronic Circuits 4         5         2         5           B2B31EO1         Electronic Circuits 1         Circuits 4         5           B2B32EO1         Electronic Circuits 1         Circuits 4         5           B2B32EO1         Physics 1         Tracinits 4         5         7           B2B32EO1         Physics 1         Tracinits 4         5         8         7         7           B2B32EO1         Physics 2         Tracinits 4         8         8         8         7 <td></td> <td></td> <td>2,21</td> <td>4</td>			2,21	4
The course gets as tablets accurated with principles and taplets detectioning principles of theory balance.           EQ331EQ1         Electronic Circuits 1         ZZK         4           The course incluices balance circuits 1         ZZK         4           The course incluices balance circuits 1         ZZK         4           The course incluices balance circuits 1         ZZK         5           ZBARELPA         ZZK         8           The course incluices balance circuits 1         ZZK         8           Segment with the course of circuits 1         Circuits 1         2         2         2         8         8         8         1         1         2         2         8			Z,ZK	5
The output the output the periodia and formation is experimentally signed and a contribute scalar principles of departed in a structure of the second prior of the structure of the stru			,	-
Titles. Index with the principles and features of incurs for generating signals and a controlled excilitor including the PLL circuit and its use. The last part of the course is devoted to beard info course in freedoms. Physical principles of operation, device structures and characterics are excilented to beard info course. The course of devices are excerned in an entropies of operation, device structures and characterics are excilented to beard principles of operation. How cannes are beard only. Courses in devices in device the device structures are deviced to beard principles of operation. How cannes are beard only.           The course in devices in device the device structures are excerned. In seminare and last, structures are introduced to beard principles of the device and magnetic feel. Within the formeroxic of the device structures, the structures are principles. The trust cent is a based on the device structures. The base course of high bods. The trust cent is a book board to beard the device structures. The structures are principles of the device and magnetic feel. Within the formeroxic of the device and magnetic feel. The course is the device the device the device and magnetic feel. Structures are principles of the device and magnetic feel. The course is the device the device the device and magnetic feel. The course is the device the device the device the device and magnetic feel. The course is the device the device the device the device the device the device and magnetic feel. Structures are the structure is the structure of the device the device the device and magnetic feel. The course is principle. The course is the device the	B2B31EO1	Electronic Circuits 1	Z,ZK	4
bala captures and the state of				
B2B3E4ELPA         Electron Devices         2,2K         5           This course introduces the base how, provides of spectra and properties of electron devices. Physical principles of operation, device and values are introduced to base principles of devices mankamentary. Base applications is an example and applications are examined. In seminars and ables, students are introduced to base principles of devices mankamentary. Special and estation of electron devices. Physical 1         2,2K         8           The basic course of physics at the Faculty of Electrical Engineering - Physics 1, is devided to the introduction into two important areas of physics. The state and and physics in the second one into a special exploremental subple particles of electrical electron devices. Physics 1, is devided to the introduction into two important areas of physics. The state and and physics at the electrical conservation and electroduction into two important areas of physics. The state and and physics in the state is and electron devices. Physics 1, the outper her the same particle, system of the state is regarded to take to state take prices on the state is applicable of the state is applicable applicable of the state is applicable of the state			st part of the cour	se is devoted to
The outer introduces the basic theory, provides or person and properties of electron devices. Physical principles of operation, device structures and characteristics are examined. In sensing and the structure devices them analyzed using the Piperia and the structure of device simulation, measurement of device shere territories of a device simulation. The structure of the struct			7 7K	5
principles of device simulation, measurement of device characteristics and extraction of device parameters. Operation of electron devices is them analyzed using the PSpecie simulation. measurement of device characteristics and extraction of device parameters. Operation of electron devices is them analyzed using the PSpecie simulation. The parameter list device flag transmitter and measurement of device flag transmitters. The structure is a classical mechanics and the second one is the electricit and magnetic field. Which the framework of the classical mechanics, the structures is using a classical mechanics, device and measurement of device flag transmitters are also and the second one is the electricit and magnetic field. Soft attracture are used attracted one to a classical and the second one is the structure is using a classical mechanics, used or device flag to the structure is using a classical mechanics and the second one is the structure is using a classical mechanics and the second one is a classical mechanics and the second one is a classical mechanics and the second one is a classical mechanics and the structure is using a classical mechanics. Apart of the structure is the structure is the structure is the structure is a classical mechanics and the second one is a classical mechanics. Apart of the structure is the structure is a classical mechanics is a structure in the structure is a classical mechanics. Apart of the structure is a classical mechanics and the second one is a classical mechanics and the second one is a classical mechanics and the second one is a classical mechanics. Apart of the structure is the structure is a structure is the structure is the structure i			· ·	-
the PSpice simulator:           bit Physics 1         Z,ZK         8           The basic curves of physics at the Faculty of Excitned Engineering - Physics 1, is devoted to the introduction into two important areas of physics. The first one is a disasteal mechanics, indexiding in the description of mechanical systems. The disasteal mechanics, the introduction into two important areas of physics at the react one is a disasteal mechanics, the introduction into the source of mechanical systems. The disasteal mechanics, the introduction in the source is the study of the discipation interview of the disasteal mechanics, the method with the scare study of the discipation interview of discretion into the origin physics. The disasteal mechanics, the method with the curves in the study of the discretion into the origin physics. The disasteal mechanics, depending and magnetic field. Which we can use the study of the discretion in the source in the study of the discretion in the source in the study of the discretion of mechanical systems. The disasteal mechanics, depending and the source in the study of the discretion of the source in the study of the discretion in the properties of waves and will help to the audentin in study of a discretion discretion in the properties of waves and will help to the audentin in study of a discretion discretion discretion discretion discretion.           BZB02FY2         Physics 2         The toxics Physics 4         Z/ZK         T           BZB02FY2         Physics 1         The toxics Physics 4         T         Z/ZK         T           BZB02FY2         Physics 1         The toxics Physics 4         Z/ZK         T         T           BZB02FY2         Physics 1         The toxics Physics	together with adequate	models for small- and large-signal. Basic applications in analogue and digital electronics are examined. In seminars and labs	, students are intr	oduced to basic
B2B02PY1         [Physics 1]         2.ZK         8           The basic course of physics at the factory of Electrical Engineering - Physics 1, is devoted to the introduction into two importice internations (quantes of the aspacing) of the analysics. The fit down is a devised annext and the second one is a devised annext and the first and annext and the iso devised is a devised of the devised annext and the second one is a devised annext annext and the second one is a devised annext annext and the second one is a devised annext annext annext and the second one is a devised annext annext annext and the second one is a devised annext annext annext and the second one is a devised annext annext annext and the second one is a devised annext anne		ulation, measurement of device characteristics and extraction of device parameters. Operation of electron devices in electron	ic devices is then	analyzed using
The basic course of physics a fitter Faculty of Electrodic Engineering - Physics 1, is divided to the introduction into two important areas of physics. The fract one is a classical mechanics, between divides and physics and the machine is divided to adve basic problems duality with the discription of mechanics dynamics, dynamics of the mass particle and mechanics is divide to adve basic problems duality with the discription of mechanics dynamics, dynamics and use that sug parted in this course in the study of electrodical crists, theory of electrodichical materials or radioadication and magnetic field. A third statements are used to advect the study of the advection of electrodichical materials or radioadicetrorics. Apart of this, the knowledge gained in this course is required for the study of the advection of the advecti		Dhusies 4	7 71/	
and the second one is the electric and magnetic field. Within the framework of the datascial mechanics, the students study the particle known is of undern students students should be also have basing one-balance students explained and the decryption of mechanical systems, which have can mech during the further students. The datascial mechanics, electric and magnetic field - tooh stationary as well as non-stationary. The students can use the facts gained in this course in the students should insight of the students basic insight in the therm provide a students should insight on the decryption of mechanical systems. Which have basic and the students are insight in the therm provide is ourse the students will first of all sam found across 4 mechanics and makes that the presented discristion of the waves have a universal bulket with the course will give to the students basic insight in the therm provide is ourse and will allow the students basic insight in the provide student to the students to students to the			, ,	-
of mass particles and rigid bodies. The students about be able to solve basic problems dealing with the description of mechanical systems, which they can meet during their further during their further during their further during the students of under the student of under students. Apart of this, the knowledge gained in this course is required for the study of the consensultive course is required for the study of the consensultive course is required for the study of the consensultive course is required to the study of the course is required to the students will first of all term fundations of the mechanical section of the waves has a course to regular always are the study of such moder marks as robubics, or particular waves are the study of the students will first of all term fundations of the students. Biol biol waves and will allow then outlents they be is the vaves has a course to regular waves are the study of such moder marks as robubics, and the course biyous and the study of such moder marks as robubics. Biol biol waves and will allow then outlents and the principles of novel technologies and functioning of new electronic diverse. Biol biol waves and will allow then outlents and they principles of novel technologies and functioning to the students of the students of the students and the students and they are not an an and will allow then outlents of the principles of one real variable. The student and they are not an and the students will the the total consels and the principles of the students will the total consels. The student and they are not an and the students will the total consels and the students and they are not an and the students and they are not an and the students and they are not and they are not an and they are not an and the st				
In this course in the study of electrical circuits, theory of electrotechnical materials or redioelectronics. Apart of this, the knowledge gained in this course is required for the study of the concenter to course Physics 2. The				
consecutive course Physics 2.         Physics 2         ZZK         7           The course Physics 2 is closely inside with the course Physics 1. Within the framework of his course the students will first of alleans touchdison of thermodynomics. Following topic in the those of waves haves and will be to the students and includer in splite of the waves have as understand the top reserved description of the waves have as understand the provide section. Countum mechanics and nuclear physics will complet the student of all works and will be to the students in study of such modern areas as robotics.           DBOD1LAAA         Complex the analysis         Z,ZK         4           DBO1LAAA         Complex the analysis 1         Z,ZK         7           DBO1LMAAA         Mathematical Analysis 1         Z,ZK         6           The anitroduction to the differential and integral calculus of functions of one real variable.         Z,ZK         6           DBO1LMAAA         Mathematical Analysis 1         Z,ZK         6           The abojet covers in introduction to the differential and integral calculus in several variables and basic relations between curve and surface integrated circulus.         E           DBO1MAAA         Microelectronics         KZ         4           Students bacoms familiar with the latest tends in the field of microelectronics. The course provide students with the microelectronic structures and technologies of negrated circulus.           DBO1MAAA         Microelectronics         KZ         4				-
DEBOS/PY2         IPhysics 2         7           The course Physics 1 is closely inform with the course Physics. 1. Within the framework of the students is understand that the presented description of the waves has a lunceter of yorks and will help to the students is understand that the presented description of the waves has a course or optical waves are the subjects of the following section. Quantum mechanics and nuclear physics. Will complete the student's general education in physics. The troowledge gained in this course with help to the students is study of such noother areas as robotics. Computer willow meaning techniques and will allow them to understand the principles of novel technologies and functioning of new electronic devices.           B0B011AGA         Complex Analysis         Z,ZK         4           B0B011AGA         Mathematical Analysis 1         Z,ZK         6           B0B011AGA         Mathematical Analysis 1         Z,ZK         6           B0B011AGA         Mathematical Analysis 1         Z,ZK         6           B0B011AGA         Mathematical Analysis 2         Z,ZK         6           B0B011AGA         Mathematical Analysise			rse is required for	the study of the
The course Prysics 2 is clearly linked with the course Prysics 1. Within the framowork of this course the students will first of all sevents basis insight into the properties of www.s. such as acoustic or optical www.s. are the students of the looking section. Quantum mechanics and nuclear physics into orgenise of www.s. such as acoustic or optical www.s. are the students of the looking section. Quantum mechanics and nuclear physics in those of the work has a set obtains. The working space in this course will have to the students in study of such modern areas as chooling. Section Quantum mechanics and nuclear physics in those of the diverse physics 1. Z/ZK 4 BOB01LAGA Linear Agebra is a chooling of new electronic devices. Section 2. Z/ZK 6 G The subject corres in introduction to the differential and integral calculus of functions of one reat variable. BOB01MA2A Mathematical Analysis C and physics with the subject corres in introduction to the differential and integral calculus in several variables and basic relations between curve and surface integrals. Other part contains functions are introductions to the differential and integral calculus in several variables and basic relations between curve and surface integrals. Other part contains functions are integrated to the differential and integral calculus in several variables and basic relations between curve and surface integrated circulus; micro services match and the severa is basis on solving computational tasks and multi-finaed applications. The course introduces students to the design of an anotelectronics and integrated circulus; and participa computational tasks and multi-finaed applications, synchronization mechanisms and models dimetis students with the discleaded bid or diverse action of a student stude student with media displications, representation or the state space; and local ophysi	;		7 7K	7
- the theory of waves - will give to the students basic insight into the properties of waves and will help to the students to understand that the presented description of the waves has a nuclear physics will complete the student's ensent ense shared e. Principles of nevel technologies and functioning of neve identify section. Quantum mechanics are optical waves are the subjects of the following section. Quantum mechanics are optical waves are the subjects of the following section. Quantum mechanics are optical waves are used in the following section. Quantum mechanics are obtained to prove itechnologies and functioning of neve identify and the students in study of such modern areas as robotics. BOBO1KANA Mathematical Analysis 1 Z,ZK 4 E BOBO1LAGA Linear Algebra Z,ZK 7 E BOBO1MA2A Mathematical Analysis 2 C Z,K 6 E The subject covers an introduction to the differential and integral calculus in several variables and basic relations between curve and surface integrate. Other part contains function excess set with application to Taylor and Pourier series. BZB34MIT Microelectronics The course provide students with the microelectronic structures and the following or dimutation in target and Pourier series. BZB34MIT C (C++ programming in CC++ with an emphasis on solving computational tasks and multi-threaded applications. BESB39PEC Practical C++ programming in CC++ with an emphasis on solving computational tasks and multi-threaded applications. Becomplexel and one provides students with medice of abilitary precision data representations or bandward literary STL. Solvents beam the principles of parallel programming in CC++ with an emphasis on solving computational tasks and multi-threaded applications. The second part is depicated or diverse students with the first of the covers of standard literary STL. Solvents are one computation on photenes to second task and multi-threaded applications. The second part is depicated or diverse and provides students with models of arbitrary precision data representations or manutatin			, ,	
nuclear physics will complete the student?s general education in physics. The knowledge gained in this course will help to the addents in study of such modern areas as nobotics, computer vision, measuing technique and will allow them to understand the principles of novel technologies and functioning of new electronic devices. BOB01KANA Complex Analysis BOB01MANA Mathematical Analysis 1 Z,ZK 4 BOB01LAGA Linear Algebra Z,ZK 6 BOB01MANA Mathematical Analysis 2 Z,ZK 6 BOB01MANA Mathematical Analysis 2 Z,ZK 6 The subject covers an introduction to the differential and integral calculus of functions of one real variable. BOB01MANA Mathematical Analysis 2 Z,ZK 6 The subject covers an introduction to the differential and integral calculus in several variables and basic relations between curve and suface integrals. Other part contains function series and power series with application to Taylor and Fourie series. B2B34MIT Microelectronics K Z 4 Students become familiar with the latest tends in the field of microelectronics. The course provide students with the microelectronic structures and technologies of integrated circuits; micro sensors and microelectro-microlectronic series. B2B34MIT Microelectronics K C 4 Students become familiar with the latest tends is like in programming in CC++ with an emphasis on solving computational tasks and multi-threaded applications; withor garamming. The first part of the course is devided to the object-oriented programming in C++ and provides daplications. B0B39PRPA Procedural Programming threaders by searching the problem state space. Two main approaches are considered: the deterministic search of a graph representation of the state space; and local optimization techniques. Additionally, students will be familiarized with models of arbitrary precision data representation of analysis and by procedural Programming to C++ and developed inclustons. The course also introduces the basic characteristics of matrices, and matric calculations. B0B39PRPA Procedural Progra			-	
compare vision. measuring technique and will allow them to understand the principles of novel technologies and functioning of new electronic devices.           B0B01LAGA         Linear Algebra         Z,ZK         4           B0B01LAGA         Linear Algebra         Z,ZK         7           B0B01MA1A         Mathematical Analysis 1         Z,ZK         6           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 convex on Mathematical Analysis 2         Z,ZK         6           Students become an incorduction to the differential and integral calculus in several variables and basic relations between curve and surface integrals. Other part contains function structures and technologies of integrated circults; micro sensors and micro-electronics The course provide students with the microelectronic structures and technologies of integrated circults; micro sensors and micro-electronice of standard library STL, standard applications, provides students with the second part is decirculate to sensor standard library STL; Standard applications, provides students with the second part is decirculate to experiming in C++ and anaptrosches are considered; the deterministic search of a graph representation of the state space; and local optimization techniques. Additionally, students will be semiliarized with models of abitrary precision data representation of a analyse function.           S08099PRPA.         Procedural Programming         KZ         4     <	universal character in sp	bite 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
BIOBOIKANA         Complex Analysis         Z,ZK         4           BOBOILAGA         Linear Algebra         Z,ZK         7           BOBOINATA         Mathematical Analysis 1         Z,ZK         6           This is an introductory course to differential and integral calculus in several variable.         Z,ZK         6           BOBOINATA         Mathematical Analysis 2         Z,ZK         6           The subject covers an introduction to the differential and integral calculus in several variables and basic relations between curve and surface integrals. Other part contains function series and power series with application to Taylor and Fourier series.         KZ         4           Students become familiar with the listest trends in the field of microelectronics. The course introduces students to the design of nancelectronics and integrade dirculus.         KZ         4           B2B34MIT         Microelectronics         KZ         6         6           The course introduces students to the C++ and develops their practical skills in programming in C++ + and provides students with basic data containers of standard Binary STL.         6           Disdentistant the state space. Two anit provides tudents with ead of multi-threaded applications. synchronization mechanisms and models of multi-threaded applications. Synchronization mechanisms and models of multi-threaded applications.         6           DB399PRA         Procedural Programming         KZ         4 <td< td=""><td></td><td></td><td></td><td>as robotics,</td></td<>				as robotics,
BOBDILAGA         Linear Algebra         Z,ZK         7           BOBDIMAIA         Mathematical Analysis 1         Z,ZK         6           This is an introductory course to differential and integral calculus in several variables.         Z,ZK         6           BOBDIMA2A         Mathematical Analysis 2         Exclusion to the differential and integral calculus in several variables and basic relations between curve and surface integrate. Other part contains function is series and power series with application to Taylor and Fourier series.         ZZK         4           Students become familiar with the latest trends in the field of microelectronics. The course provide students with the microelectronic structures and technologies of integrated circuits; micro series and mitcrevelector-mechanical systems. The course introduces students with the altest trends in the field of microelectronics.         KZ         4           Students become familiar with the latest trends in the field of microelectronics. The course provide students with the altest trends in the field of microelectronics. The ourse provide students with basic data containers of standard fibrary STL.         6           The course introduces students to the C++ and develops their practical skills in programming in CC++ with an emphasis on solving computational tasks and multi-threaded applications. The second part is deviced and algorithmic thinking to solve computational problems by scarching the problem matrix eacturalianers of standard the gart develop an algoritaria.         6           Students become familiar with the fister and two courses is deveoted to the contain aproproaches are comaineer. <td></td> <td></td> <td></td> <td>4</td>				4
BOBDIMA1A         Mathematical Analysis 1         Z,ZK         6           This is an introductory course to differential and integral calculus of functions of one real variable.         Z,ZK         6           BOBDIMA2A         Mathematical Analysis 2         Z,ZK         6           The subject covers an introduction to the differential and integral calculus in several variables and basic relations between curve and surface integrals. Other part contains function series and power series with application to Taylor and Fourier series.         KZ         4           Students become familiar with the fatest trends in the fold of microelectronics. The course provide students with the microelectronic stude students between curve and surface integrated circuits; micro sensors and micro-electronechanical systems. The course introduces students to the C + and tegrated applications surface and the C + and developes their practical skills in programming in CC++ with an emphasis on solving computational tasks and multi-threaded applications. Surface and the curves is devoted to the object-oriented programming in CC++ and the microele students to face and provides students and material programming, multi-threaded applications, surface mains and models of arbitrary precision data representation of that state space, and local optimization techniques. Additionally, students will be familiarized with models of arbitrary precision data representation or hardnes and matrix calculations.           BOB99PRPA         Procedural Programming         KZ         4         B28PROJA         B28PROJA         B28PROJA         B28AVSEE         Secons in Electronics         Z/ZK         4         B28PROJ				
This is an introductory course to differential and integral calculus of functions of one real variable.           BOB01MA2A         Mathematical Analysis 2         Z,ZK         6           BUB31M2A         Mathematical Analysis 2         XZ         6           Bub323         Mathematical Analysis 2         KZ         4           Students become familiar with the latest trends in the field of microelectronics. The course provide students with the microelectronic structures and technologies of integrated circuits:         KZ         4           Students become familiar with the latest trends in the field of microelectronics. The course provide students with an emphasis on solving computational tasks and multi-threaded applications using paralial programming. The trans the design of naneelectronics and integrated circuits:         KZ         6           Bub or events         Fractical C/C++ programming         KZ         6           Students beam the principles of parallel programming in C++ and provides students with basic data comtainers of standard library STL.         Students beam the principles of parallel programming multi-threaded applications. Synchronization mechanisms and models of multi-threaded applications. The second part is dedicated to develop an align programming. The threaded applications with models of arbitrary precision data representation of the state space; and local ophimization techniques. Additionally, students will be formiliarized with models of arbitrary precision data representations.           BOBS9PRPA         Procedural Programming         KZ         4         4         2         6				
B0B01MA2A         Mathematical Analysis 2         Z,ZK         6           The subject covers an introduction to the differential and integral calculus in several variables and basic relations between curve and surface integrals. Other part contains function series and power series with application to Taylor and Fourier series.         KZ         4           Students become series with application to Taylor and Fourier series.         KZ         4         4           Students become series with application to Taylor and Fourier series.         KZ         4         4           Students become and micro-electronics and integrated situations. The course introduces students to the C++ and develops their practical skills in programming in C/C++ with an emphasis on solving computational tasks and multi-threaded applications. Systemotical skills in programming in C/C++ with an emphasis on solving computational tasks and multi-threaded applications. Systemotical skills subgestizations. Systemotical skills in programming in C/C++ with an emphasis on solving computational tasks and multi-threaded applications. Systemotical skills in programming in C/C++ with an emphasis on solving computational tasks and multi-threaded applications. Systemotical skills in programming in C/C++ with an emphasis on solving computational tasks and multi-threaded applications. The second with threaded integrate acculations. The second with skill be applications. Systemotical skills in programming in C/C++ with an emphasis on solving computational tasks and multi-threaded applications. Systemotical skills in programming in C/C++ with an emphasis on solving computational tasks and multi-threaded applications. The second with threaded in target and integrate acculations.           Subdents become a			Ζ,ΖΝ	0
The subject covers an introduction to the differential and integral calculus in several variables and basic relations between curve and surface integrals. Other part contains function series with application to Taylor and Fourier series.           B2B34MIT         Microelectronics         KZ         4           Students become familiar with the latest trands in the field of microelectronics. The course provide students with the microelectronic structures and technologies of integrated circuits; micro sensors and micro-electro-mechanical systems. The course introduces students to the design of nanoelectronics and integrated circuits;           B2B99PPC         Practical C/C++ programming. The the object-oriented programming in C++ and provides students with basic data containers of standard library STL.           Students learn the principles of parallel programming, multi-threaded applications, synchronization mechanisms and models of multi-threaded applications. The second part is dedicated to develop an algorithmic thinking to solve computational problems by searching the problem state space. Two main approaches are considered: the deterministic search of a graph representation of the state space; and local optimization techniques. Additionally, students will be familiarized with models of arbitrary precision data representation, representation, or the state space; and local optimization techniques a topic from a range of topics related to his or her branch of study, which will be specified by branch department or branch departments. The project will be defended within the framework of a subject.           B2B39PRD3         Signals and systems         Z,ZK         5           Independent work in the form of a project.         KZ         4           Hodgenedt work			7.7K	6
B2B34MIT         Microelectronics         KZ         4           Students become familiar with the latest trends in the field of microelectronics. The ourse provide students with the microelectronic and integrated circuits.         KZ         4           Students become familiar with the latest trends in the field of microelectronics. The ourse introduces students to the C++ and provides students to the C++ and develops their practical skills in programming in C/++ with an emphasis on solving computational tasks and multi-treaded applications.         KZ         6           The course introduces students to the C++ and develops their practical skills in programming in C/++ with an emphasis on solving computational tasks and multi-treaded applications.         Students with basic data containers of standard library STL.           Students learn the principles of parallel programming, multi-threaded applications, synchronization mechanisms and models of multi-threaded applications.         The ecourse introduces students with the size space. Two main approaches are considered: the deterministic search of a graph representation of the state space; and local optimization techniques. Additionally, students will be familiarized with models of arbitrary precision data representations, representation of matrice, and are project.           Hodgendent work in the form of a project.         KZ         4           R2B34SEE         Secors in Electronics         Z,ZK         4           B2B34SEE         Secors in Electronics         Z,ZK         4           B2B34SEE         Secors in Electronics         Z,ZK         5 <td></td> <td>-</td> <td>, ,</td> <td>-</td>		-	, ,	-
Students become familiar with the latest trends in the field of microelectronics. The course provide students with the microelectronic structures and technologies of integrated circuits; micro sensors and micro-electron-mechanical systems. The course introduces students to the design of nanoelectronics and integrated circuits; micro sensors and micro-electron-mechanical systems. The course introduces students to the C + and develops their practical skills in programming in CC++ with an emphasis on solving computational tasks and multi-threaded applications; synchronization mechanisms and models of multi-threaded applications. The second part is dedicated to develop an algorithmic thinking to solve computational problems by searching the problem state space. Two man approaches are considered: the deterministic search of a graph representation of the state space; and local optimization techniques. Additionally, students will be familiarized with models of arbitrary precision data representations of the state space; and local optimization techniques. Additionally, students will be familiarized with models of arbitrary precision data representation of matrices, and matrix calculations.  BOB99PRPA Procedural Programming Mich threaded applications; and oncides of multi-threaded applications. The second part is dedicated to develop the state space is in Electronics Z, ZK 4 4 E32BPRCJ6 Bachelor project NZ 4 4 E32BPRCJ6 Bachelor project will be defended within the framework of a subject.  B2B34SEE Sesons in Electronics Z, ZK 4 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		with application to Taylor and Fourier series.		
micro sensors and micro-electro-mechanical systems. The course introduces students to the design of nanoelectronics and integrated circuits.          B2B99PPC       Practical C/C++ programming       KZ       6         The course introduces students to the C++ and develops their practical skills in programming in C/C++ with an emphasis on solving computational tasks and multi-threaded applications: using parallel programming, multi-threaded applications, synchronization mechanisms and models of multi-threaded applications. The second part is dedicated to develop an algorithmic thinking to solve computational problems by searching the problem state space. Two main approaches are considered: the deterministic search of a graph representation of the state space; and local optimization techniques. Additionally, students will be familiarized with models of arbitrary precision data representations, representation of matrix calculations.         B0B99PRPA       Procedural Programming       KZ       4         B2B97CO       Bachelor project       KZ       6         Independent work 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 specified by branch department or branch departments. The project will be defended within the framework of a subject.       ZZK       4         B2B37SAS       Signals and systems       ZZK       5       Sintroductro yourse focus on a description of continuous- and discrete-time signals and systems in time and frequency domains. The course also intrduces the basic characteristics of bandpass signals, analog modulations and random signals.       ZZK       5         B2B37TSAS       S	-		I	=
B2B99PC         Practical C/C++ programming         KZ         6           The course introduces students to the C ++ and develops their practical skills in programming in C/+ + with an emphasis on solving computational tasks and multi-threaded applications using parallel programming, multi-threaded applications, synchronization mechanisms and models of multi-threaded applications. The second part is dedicated to develop an algorithmic thinking to solve computational problems by searching the problem state space. Two main approaches are considered: the deterministic search of a graph representation of the state space; and local optimization techniques. Additionally, students will be familiarized with models of arbitrary precision data representations, representation of matices, and matrix calculations.         KZ         4           BDB99PRA         Procedural Programming         KZ         4         E28PROJ6         Bachelor project         KZ         4           Independent work 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 specified by branch department or branch of study, writer fourse foursed on a description of continuous- and discrete-time signals and systems in time and frequency domains. The course also introduces the basic characteristics of bandpass signals, analog modulations and random signals.         Z,ZK         5           B2B99TDS         Technical Writing         KZ         4         4         4         4         4         5         5         5         5         5         5         2         KZ         4         <			echnologies of inte	egrated circuits;
The course introduces students to the C ++ and develops their practical skills in programming in C/C++ with an emphasis on solving computational tasks and multi-threaded applications using parallel programming. The first part of the course is devoled to the object-oriented programming in C/C++ with an emphasis on solving computational tasks and multi-threaded applications. The second part is dedicated to develop an algorithmic thinking to solve computational problems by searching the problem state space. Two main approaches are considered: the deterministic search of a graph representation of the state space, and local optimization techniques. Additionally, students will be familiarized with models of arbitrary precision data representations, representation of matrices, and matrix calculations.          BOB9PRPA       Procedural Programming       KZ       4         B2BPROJ6       Bachelor project       KZ       6         Independent work in the form of a project. Student will choose a topic from a range of topics related to his or her branch of study, which will be specified by branch department or branch departments. The project will be defended within the framework of a subject.       Z,ZK       4         B2B34SEE       Secons in Electronics       Z,ZK       5         Inductory course focused on a description of continuous- and discrete-time signals and systems in time and frequency domains. The course also introduces the basic characteristics of banchase signals, analog modulations and random signals.       B2B97TS       Technical Writing       KZ       4         B2B99TPS       Technical Writing       KZ       4       4       4       4       4       4			<b>K</b> 7	6
using parallel programming. The first part of the course is devoted to the object-oriented programming in C++ and provides students with basic data containers of standard library STL. Students learn the principles of parallel programming, multi-threaded applications, synchronization mechanisms and models of multi-threaded applications. The second part is dedicated to develop an algorithmic thinking to solve computational problems by searching the problem state space. Two main approaches are considered: the deterministics search of a graph representation of the state space; and local optimization techniques. Additionally, students will be familiarized with models of arbitrary precision data representations, representation of matrices, and matrix calculations. BOB99PRPA Procedural Programming multi-threaded applications. 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 specified by branch department or branch departments. The project will be defended within the framework of a subject. B2B34SEE Searcs in Electronics Z,ZK 4 B2B37SAS Signals and systems in time and frequency domains. The course also introduces the basic chracteristics of bandpass signals, analog modulations and random signals. B0B01STP Statistics and Probability Z,ZK 5 B2B90TS Technical Writing B2B17TBK Wireless Communication Technique B2B17TBK Wireless Communication Technique B2B17TBK Wireless Communication Technique B2B17TBK Wireless Communication Technique B2B17DBK IN departed the steps devolution and related review of physical background, its main approaches are communication study program, its main purpose is to teach all important aspects of this technical branch in the majority of electronic devices (ike PCs, tablets, notebooks, cameras, etc. With expected fast development of matrix calculations. B2B17DBK Wireless Communication Technique KZ 4				-
to develop an algorithmic thinking to solve computational problems by searching the problem state space. Two main approaches are considered: the deterministic search of a graph representation of the state space; and local optimization techniques. Additionally, students will be familiarized with models of arbitrary precision data representations, representation of matrice, acloudations.          B0B99PRPA       Procedural Programming       KZ       4         B2EPROJ6       Bachelor project       KZ       6         Independent work 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 specified by branch department or branch departments. The project will be defended within the framework of a subject.         B2B34SEE       Sesors in Electronics       Z,ZK       4         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 introduces the basic characteristics of bandpass signals, analog modulations and random signals.       4         B0E01STP       Statistics and Probability       Z,ZK       5         B2B97PS       Technical Writing       KZ       4         Wireless communication signals and supstem signals dowed and probability seles in the Model.       KZ       4         B2B97PS       Technical Writing       KZ       4         Model       Wireless Communication Technique				
representation of the state space; and local optimization techniques. Additionally, students will be familiarized with models of arbitrary precision data representations, representation of matrices, and matrix calculations.           BOB99PRPA         Procedural Programming         KZ         4           B2BPROJ6         Bachelor project         KZ         6           Independent work 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 specified by branch department or branch departments. The project will be defended within the framework of a subject.         Z,ZK         4           B2B37SEE         Sesors in Electronics         Z,ZK         4           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 introduces the basic characteristics of bandpass signals, analog modulations and random signals.         E2B37SK         Signals and systems           B2B91TPS         Technical Writing         KZ         4           PS217BK         Wireless Communication Technique         KZ         4           Wireless communications belog to the fastest developing technical fields. Besides widely used mobile telephony systems, this field also includes many other both mobile and stationary communications study program, its main purpose is to technical branch. Obtained knowledge should enable the students of the Electronics and Communication study program, its main purpose is				
of matrices, and matrix calculations.       KZ       4         BOB99PRPA       Procedural Programming       KZ       4         B2BPROJ6       Bachelor project       KZ       6         Independent work 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 specified by branch department or branch departments. The project will be defended within the framework of a subject.         B2B34SEE       Sesors in Electronics       Z,ZK       4         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 introduces the basic characteristics of bandpass signals, analog modulations and random signals.       5         B0B01STP       Statistics and Probability       Z,ZK       5         B2B397DS       Technical Writing       KZ       4         PS2B99TPS       Technical Writing       KZ       4         Wireless communication scientific reports (lab report, article, final thesis etc.) Also important is, in addition to language and stylistic skills, to show how to obtain and present scientific information. Given are also up-to-date methods for efficient typing and document automation, including LaTeX. All topics are practiced by related task in the Modile.         B2B17TBK       Wireless Communication Technique       KZ       4				
B0B99PRPA         Procedural Programming         KZ         4           B2BPROJ6         Bachelor project         KZ         6           Independent work 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 specified by branch department or branch departments. The project will be defended within the framework of a subject.           B2B34SEE         Sesors in Electronics         Z,ZK         4           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 introduces the basic characteristics of bandpass signals, analog modulations and random signals.         5           B0B01STP         Statistics and Probability         Z,ZK         5           B2B99TPS         Technical Writing         KZ         4           Wireless Communication. Given are also up-to-date methods for efficient typing and document automation, including LaTeX. All topics are practiced by related tasks in the Moodle.         KZ         4           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 bot mobile and stationary communications study program, its main purpose is to teach all important aspects of this technical branch. Obtain			representations, i	epresentation
B2BPROJ6         Bachelor project         KZ         6           Independent work 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 specified by branch department or branch departments. The project will be defended within the framework of a subject.         B2B34SEE         Sesors in Electronics         Z,ZK         4           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 introduces the basic characteristics of bandpass signals, analog modulations and random signals.         B0B01STP         Statistics and Probability         Z,ZK         5           B2B99TPS         Technical Writing         KZ         4         4           B2B17TBK         Wireless Communication. Given are also up-to-date methods for efficient typing and document automation, including LaTeX. All topics are practiced by related tasks in the Moodle.         KZ         4           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, etc. With expected fast development of Internet of Things, operation of billions of wireless sensors i			K7	4
Independent work 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 specified by branch department or branch departments. The project will be defended within the framework of a subject.          B2B34SEE       Sesors in Electronics       Z,ZK       4         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 introduces the basic characteristics of bandpass signals, analog modulations and random signals.         B0B01STP       Statistics and Probability       Z,ZK       5         B2B397PS       Technical Writing       KZ       4         The course aims to help students with various technical or scientific reports (lab report, article, final thesis etc.) Also important is, in addition to language and stylistic skills, to show how to obtain and present scientific information. Given are also up-to-date methods for efficient typing and document automation, including LaTeX. All topics are practiced by related tasks in the Moodle.         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, etc. With expected fast development of Internet of Things, operation of billions of wireless sencerule include review of				
B2B34SEE         Sesors in Electronics         Z,ZK         4           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 introduces the basic characteristics of bandpass signals, analog modulations and random signals.         BOB01STP         Statistics and Probability         Z,ZK         5           B2B39TPS         Technical Writing         KZ         4           The course aims to help students with various technical or scientific reports (lab report, article, final thesis etc.) Also important is, in addition to language and stylistic skills, to show how to obtain and present scientific information. Given are also up-to-date methods for efficient typing and document automation, including LaTeX. All topics are practiced by related tasks in the Moodle.           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, etc. With expected fast development of its oreponents. Besides wireless system analysis, the lectures include review of physical backgrounds, survey of the most important existing radio systems together with corresponding operational frequencies, description of electromagnetic wave propagation and related antennas. Instructions concerning propagation also cover behavi			1	-
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 introduces the basic characteristics of bandpass signals, analog modulations and random signals.         B0B01STP       Statistics and Probability       Z,ZK       5         B2B99TPS       Technical Writing       KZ       4         The course aims to help students with various technical or scientific reports (lab report, article, final thesis etc.) Also important is, in addition to language and stylistic skills, to show how to obtain and present scientific information. Given are also up-to-date methods for efficient typing and document automation, including LaTeX. All topics are practiced by related tasks in the Moodle.         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, etc. With expected fast developing to final the subject is common to all students of the Electronics and Communication system wireless communication system or its components. Besides wireless system analysis, the lectures include review of physical backgrounds, survey of the most important existing radio systems together with corresponding operational firequencies, description of electromagnetic wave propagation and related antennas. Instructions concerning propagation also cover behavior of EM wave	branch departments. Th	e project will be defended within the framework of a subject.		
Introductory course focused on a description of continuous- and discrete-time signals and systems in time and frequency domains. The course also introduces the basic characteristics of bandpass signals, analog modulations and random signals.           BUBD1STP         Statistics and Probability         Z,ZK         5           B2B99TPS         Technical Writing         KZ         4           The course aims to help students with various technical or scientific reports (lab report, article, final thesis etc.) Also important is, in addition to language and stylistic skills, to show how to obtain and present scientific information. Given are also up-to-date methods for efficient typing and document automation, including LaTeX. All topics are practiced by related tasks in the Moodle.           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, etc. With expected fast development of Internet of Things, operation of billions of wireless sensors is expected. The subject is common to all students of the Electronics and Communication study program, its main purpose is to teach all important aspects of this technical branch. Obtained knowledge should enable the students to design, project, adjust or manufacture any wireless communication system or its components. Besides wireless system analysis, the lectures include review of physical backgrounds, survey of the most important existing radio systems to gether with corresponding operational frequencies, description of elect				
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B2B99TPS         Technical Writing         KZ         4           The course aims to help students with various technical or scientific reports (lab report, article, final thesis etc.) Also important is, in addition to language and stylistic skills, to show how to obtain and present scientific information. Given are also up-to-date methods for efficient typing and document automation, including LaTeX. All topics are practiced by related tasks in the Moodle.           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, etc. With expected fast development of Internet of Things, operation of billions of wireless sensors is expected. The subject is common to all students of the Electronics and Communication study program, its main purpose is to teach all important aspects of this technical branch. Obtained knowledge should enable the students to design, project, adjust or manufacture any wireless communication or its components. Besides wireless system analysis, the lectures include review of physical backgrounds, survey of the most important existing radio systems to gether with corresponding operational frequencies, description of electromagnetic wave propagation and related antennas. Instructions concerning propagation also cover behavior of EM waves in an urban environment or inside buildings. Lectures concerning analysis of typical wireless systems also cover description of related radio-frequency, microwave and mm-wave circuits and components. Exercises include practical calculations of wireless systems,			7 7K	5
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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 converged packet-oriented systems         4				
The course introduces principles and functions of digital telecommunications systems, both transmission and switching systems as well as converged packet-oriented systems				
interconnected into universal telecommunication networks.		· · · · · · · · · · · · · · · · · · ·	1	
	interconnected into univ	rersal telecommunication networks.		

B2B15UELA	Introduction to Electrical Engineering	KZ	4
B2B31ZEOA	Fundamentals of Electric Circuits	Z,ZK	5

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 Jennings <b>Petra Jennings</b> Petra Jennings (Gar.)	KZ	0	0C	Z,L	Р
B0B04B2Z	English language B2 - exam Michael Ynsua, Dana Saláková, Petra Jennings Petra Jennings Petra Jennings (Gar.)	Z,ZK	0	0C	Z,L	Р

#### 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 Examir	nation Rules and
Regulations for Student	s at CTU (Part III, Article 4), a compulsory subject is one "whose completion is a necessary condition in order to successful!	y complete the stu	udy programme."
In addition, this requires	s the "passing of an examination evaluated on the scale A, B, C, D, or E" (SERR Part III, Article 6). II) According to the Con	nmon European F	ramework of
Reference for Language	es (CEFR), an international standard for describing language ability, the definition of an English language learner who has ach	ieved the B2 (Upp	per-Intermediate)
	understand the main ideas of complex text on both concrete and abstract topics, including technical discussions in his/her fi		
with a degree of fluency	v and spontaneity that makes regular interaction with native speakers quite possible without strain for either party. Can produ-	ce clear, detailed	text on a wide
range of subjects and e	xplain a viewpoint on a topical issue giving the advantages and disadvantages of various options." III) Students who have su	ccessfully passed	an approved
international exam withi	n the past five years may present their certificate to the Department of Languages, Faculty of Electrical Engineering.Upon a	oproval, students	are then exempt
from both the Written Te	est 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:

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
B2B31EO2	Electronic Circuits 2 Ji í Hospodka Ji í Hospodka Ji í Hospodka (Gar.)	Z,ZK	4	2P+2L	Z	PV
B2B34MIK	Microcontrollers Jan Novák, Tomáš Teplý, Vladimír Janí ek Tomáš Teplý 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	Optical sources and detectors of radiation Vít zslav Je ábek, Václav Prajzler, Tomáš Martan, David Mareš Václav Prajzler 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 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=Compulso	orv subi	ects of the	nrogran	nme
1	ectronic Circuits 2	<u>c=0011pui3c</u>	iy Subj		ZK	4
Γhe course builds on the ba	sic electric circuits course. It introduces multistage transistor amplifiers and basic applie	cations in the field	d of electro	nic systems.	Students bea	come famili
with design and measureme	nt of electronic systems, including nonlinear applications with regard to the real charac	teristics of operation	tional ampl	ifiers. Next op	erating prine	ciples and
parameters of power amplif	ers, linear stabilizers, switching power supply and D/A and A/D converters are presents	3.				
B2B34MIK Mi	crocontrollers			Z,	ZK	4
	make students acquainted with recent interesting applications, smart sensors circuits a	· ·				
• • • •	ns and measure actual properties. Because of usage of a programming language C it	will be possible to	o focus on t	<u> </u>		alization.
B0B37NSI De	sign of IoT systems				ZK	5
B2B17OKS O	tical Communication Systems			Z	ZK	4
The aim of the course is to	ntroduce students with principles of optical systems. The course covers both theoretica	I background of c	ptics and p	practical appro	aches for th	ne design o
	tend their knowledge from the ray optics through the matrix optics, subsequently and f	urther by the des	cription of o	optical system	s using Gau	issian bear
owards wave and quantum	optics. Then students will learn the basic mechanisms and principles of fiber optics.					
I I	tical sources and detectors of radiation				ZK	4
The aim of the course is to	explain the principle of optical sources, optical amplifiers and photodetectors and their t	echnology. Then	discuss the	eir use for info	rmatics and	sensors,
	circuits, both from a theoretical and a broader application point of view. Attention is also	paid to compone	ents for opt	ical communio	ation and to	compone
	antities, important measuring and diagnostic methods are given.					
I	twork Planning and Operation			· · · ·	ZK	4
elecommunications system	edge obtained in precedent studies on such issues as network planning, network design s are developed in model tasks focused on the design of selected parts of the telecomr he business aspects of telecommunications.			•		•
	dio Circuits and Devices			7	ZK	4
	ic but systematical description of fundamental types of analog and digital modulations.	A description of th	ne building	· · · ·		•
	eivers follows. A description of passive and active elements with non-distributed and dis	•	0			
and basic types of radio rec						•
	voted to contemporary structures with distributed parameters, microwave transistors of	various types, pt				
adio circuits. Attention is de	voted to contemporary structures with distributed parameters, microwave transistors of ental part of the subject: radio-frequency amplifiers and their noise properties, distribute	21 /1		rs, oscillators,	phase nois	e, crystal
adio circuits. Attention is de unction blocks is a fundame		21 /1		rs, oscillators,	phase nois	e, crystal
radio circuits. Attention is de function blocks is a fundam oscillators, mixers, double a	ental part of the subject: radio-frequency amplifiers and their noise properties, distribute nd multiply-balanced mixers.	21 /1			•	e, crystal
adio circuits. Attention is de unction blocks is a fundam oscillators, mixers, double a 32B32STE	ntal part of the subject: radio-frequency amplifiers and their noise properties, distribute	ed amplifiers, pow	er amplifie	Z.	ZK	4
adio circuits. Attention is de unction blocks is a fundam oscillators, mixers, double a 32B32STE Ne Fhe primary task of this sub	ental part of the subject: radio-frequency amplifiers and their noise properties, distribute nd multiply-balanced mixers. htwork Technologies	ed amplifiers, pow	er amplifie	Z. Students wi	ZK II comprehe	4 nd working
adio circuits. Attention is de unction blocks is a fundamo oscillators, mixers, double a 32B32STE Ne The primary task of this sub orinciples of various method	ental part of the subject: radio-frequency amplifiers and their noise properties, distribute and multiply-balanced mixers. etwork Technologies ject is to move further already acquired fundamental networking knowledge in the control	ed amplifiers, pow ext of Data Netwo i networks and las	er amplifie orks subjec st but not le	t. Students wieleast they will a	ZK	4 nd working an essentia
adio circuits. Attention is de unction blocks is a fundamo oscillators, mixers, double a 32B32STE Ne The primary task of this sub principles of various method networking theory as used i	ental part of the subject: radio-frequency amplifiers and their noise properties, distribute and multiply-balanced mixers. <b>Itwork Technologies</b> ject is to move further already acquired fundamental networking knowledge in the contr s to access common shared physical media, Ethernet switching technologies and WiFi	ed amplifiers, pow ext of Data Netwo i networks and las	er amplifie orks subjec st but not le	t. Students wieleast they will a	ZK	4 nd working an essentia
adio circuits. Attention is de unction blocks is a fundam oscillators, mixers, double a B2B32STE Ne The primary task of this sub principles of various method networking theory as used i ab.	ental part of the subject: radio-frequency amplifiers and their noise properties, distribute and multiply-balanced mixers. <b>Itwork Technologies</b> ject is to move further already acquired fundamental networking knowledge in the contr s to access common shared physical media, Ethernet switching technologies and WiFi	ed amplifiers, pow ext of Data Netwo i networks and las	er amplifie orks subjec st but not le	t. Students wi east they will a ched networks	ZK	4 nd working an essentia
radio circuits. Attention is de function blocks is a fundame oscillators, mixers, double a B2B32STE Ne The primary task of this sub principles of various method networking theory as used i ab. B0B02UAK Ini	ental part of the subject: radio-frequency amplifiers and their noise properties, distribute and multiply-balanced mixers. <b>Atwork Technologies</b> ject is to move further already acquired fundamental networking knowledge in the contr is to access common shared physical media, Ethernet switching technologies and WiFi in real practice. Students will be given a chance to get in touch with technology to impler	ed amplifiers, pow ext of Data Netwo i networks and las ment simple route	er amplifie orks subject st but not le ed and swit	Z, t. Students wi east they will a ched network	ZK   II comprehe also master s in the univ	4 nd working an essentia ersity netw 4
radio circuits. Attention is de function blocks is a fundame oscillators, mixers, double a B2B32STE Ne The primary task of this sub principles of various method networking theory as used i ab. B0B02UAK Int The subject provides overvi	ental part of the subject: radio-frequency amplifiers and their noise properties, distribute and multiply-balanced mixers. <b>Itwork Technologies</b> ject is to move further already acquired fundamental networking knowledge in the contr is to access common shared physical media, Ethernet switching technologies and WiFi in real practice. Students will be given a chance to get in touch with technology to impler <b>roduction to Acoustic</b>	ed amplifiers, pow ext of Data Netwo i networks and las ment simple route nd fields, its solut	er amplifie orks subject at but not le ad and swit	Z t. Students wi east they will a ched networks properties. Nex	ZK   Il comprehe Ilso master is in the univ KZ   t chapter de	4 nd working an essentia ersity netw 4 eals with
radio circuits. Attention is de function blocks is a fundame oscillators, mixers, double a B2B32STE Ne The primary task of this sub principles of various method networking theory as used i lab. B0B02UAK Int The subject provides overvi introduction to building and	ental part of the subject: radio-frequency amplifiers and their noise properties, distribute and multiply-balanced mixers. <b>Stwork Technologies</b> ject is to move further already acquired fundamental networking knowledge in the contr is to access common shared physical media, Ethernet switching technologies and WiFi in real practice. Students will be given a chance to get in touch with technology to impler <b>roduction to Acoustic</b> ew of main parts of acoustics. In first lectures there is introduction to basic types of sour room acoustics. The second half of the course deals with introductions to physiological	ed amplifiers, pow ext of Data Netwo i networks and las ment simple route nd fields, its solut	er amplifie orks subject at but not le ad and swit	Z t. Students wi east they will a ched networks properties. Nex	ZK   Il comprehe Ilso master is in the univ KZ   t chapter de	4 nd working an essentia ersity network 4 eals with
radio circuits. Attention is de function blocks is a fundame oscillators, mixers, double a B2B32STE Ne The primary task of this sub principles of various method networking theory as used i lab. B0B02UAK In The subject provides overvi introduction to building and and ultrasound, infrasound	ental part of the subject: radio-frequency amplifiers and their noise properties, distribute and multiply-balanced mixers. <b>Stwork Technologies</b> ject is to move further already acquired fundamental networking knowledge in the contr is to access common shared physical media, Ethernet switching technologies and WiFi in real practice. Students will be given a chance to get in touch with technology to impler <b>roduction to Acoustic</b> ew of main parts of acoustics. In first lectures there is introduction to basic types of sour room acoustics. The second half of the course deals with introductions to physiological	ed amplifiers, pow ext of Data Netwo i networks and las ment simple route nd fields, its solut	er amplifie orks subject at but not le ad and swit	Z t. Students wi east they will a ched networks roperties. Nex , musical acou	ZK   Il comprehe Ilso master is in the univ KZ   t chapter de	4 nd working an essentia ersity network 4 eals with
adio circuits. Attention is de unction blocks is a fundam- oscillators, mixers, double a 32B32STE Ne Fhe primary task of this sub principles of various method networking theory as used i ab. 30B02UAK In Fhe subject provides overvi ntroduction to building and and ultrasound, infrasound 32B17VDP Tra	Intal part of the subject: radio-frequency amplifiers and their noise properties, distribute and multiply-balanced mixers. Intwork Technologies iect is to move further already acquired fundamental networking knowledge in the contr is to access common shared physical media, Ethernet switching technologies and WiFi in real practice. Students will be given a chance to get in touch with technology to impler roduction to Acoustic ew of main parts of acoustics. In first lectures there is introduction to basic types of sour room acoustics. The second half of the course deals with introductions to physiological and their measurement.	ed amplifiers, pow ext of Data Netwo i networks and las ment simple route nd fields, its solut	er amplifie orks subject at but not le ad and swit	Z t. Students wi east they will a ched networks roperties. Nex , musical acou	ZK   Il comprehe Ilso master i s in the univ KZ   t chapter de istics, hygie	4 nd working an essenti ersity netw 4 eals with ne legislati

### Code of the group: 2018\_BEKP2

Name of the group: Compulsory subjects of the programme

production and broadcasting. Laboratory exercises are situated in a small school studio and are completed with professional excursions.

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

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.)	ΚZ	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

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.

ΚZ

4

B2B99EKP	Electronics and communication practically	KZ	4
The course is devoted to	o practical experiments with the ESP 32 SoC board and a set of external add-on modules. Students will get acquainted with	he 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 professiona
focus of the Electronics	and Communications program. Part of the exercise will be devoted to the description of the design of printed circuit boards, t	heir production a	nd mounting.
Students will get a boar	d 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 Jennings Petra Jennings (Gar.)	Z	0	2C	Z	V
B0B04B12	English Language B1-2 Petra Jennings Petra Jennings (Gar.)	Z	0	2C	L	V
B0B04B21	English Language B2-1 Petra Jennings Petra Jennings (Gar.)	Z	3	2C	Z	V
B0B04B22	English Language B2-2 Petra Jennings Petra 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

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	tudents who are beginners in their second foreign language. The course objective is to develop and sustain their basic knowl	edge of the Engli	sh 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
English.			
B0B04B21	English Language B2-1	Z	3
This course is designed	as a full-year, two semester preparation course for the university's compulsory B2-level English Examination (Anglický jazyk	B2 - zkouška - B0	B04B2Z*). While
	n helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher marl		
	vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appro-	priate level of Eng	glish for Erasmus
/ International Study.			
B0B04B22	English Language B2-2	Z	3
This course is designed	as a full-year, two semester preparation course for the university's compulsory B2-level English Examination (Anglický jazyk f	32 - zkouška - B0I	B04B2Z *). While
the course is focused of	n helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher marl	<), it also focuses	more on the
academic and technical	vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an approximately approximately and the statement of the state	priate level of Eng	glish for Erasmus
/ International Study.			

# 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	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:

One dite in the supervise O

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

TVKZV Physical Education Course Z 0	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\\

### List of courses of this pass:

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 po	int of view.
B0B01KANA	Complex Analysis	Z,ZK	4
B0B01LAGA	Linear Algebra	Z,ZK	7
B0B01MA1A	Mathematical Analysis 1	Z,ZK	6
I	This is an introductory course to differential and integral calculus of functions of one real variable.		I
B0B01MA2A	Mathematical Analysis 2	Z,ZK	6
The subject cover	s an introduction to the differential and integral calculus in several variables and basic relations between curve and surface integrals.	Other part contair	ns function
	series and power series with application to Taylor and Fourier series.		
B0B01STP	Statistics and Probability	Z,ZK	5
B0B02UAK	Introduction to Acoustic	KZ	4
The subject prov	ides overview of main parts of acoustics. In first lectures there is introduction to basic types of sound fields, its solutions and propert	ies. Next chapter d	eals with
introduction to build	ling and room acoustics. The second half of the course deals with introductions to physiological acoustics, psychoacoustics, musical	acoustics, hygiene	e legislation
	and ultrasound, infrasound and their measurement.		
B0B04A21	English Language A2-1	Z	
1	The course is open to students who are beginners in their second language. Course objective: Achieving competence in basic E	nglish.	
B0B04A22	English Language A2-2	Z	0
The course is ope	en to students who are beginners in their second foreign language. The course objective is to develop and sustain their basic knowle	dge of the English	language.

B0B04B11	English Language B1-1	Z	0
	Broadening the basic knowledge of general English; mastering basic specialised language; focusing on text analysis and vocabulary exp		iding spoken
	English.		•
B0B04B12	English Language B1-2	Z	0
	Broadening the basic knowledge of general English; mastering basic specialised language; focusing on text analysis and vocabulary exp	_	-
,	English.	,	5 1 1 1
B0B04B1K	English language B1 - classified assessment	KZ	0
BOBOIBIN	verifying of the student's skills of B1 level	112	
B0B04B21	English Language B2-1	Z	3
	gned as a full-year, two semester preparation course for the university's 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 appropria		
	/ International Study.	to lover of English	
B0B04B22	English Language B2-2	Z	3
	gned as a full-year, two semester preparation course for the university's compulsory B2-level English Examination (Anglický jazyk B2 -		1
	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 appropria		
	/ International Study.	to lover of English	
B0B04B2Z	English language B2 - exam	Z,ZK	0
	English anguage b2 - examine Exam is a compulsory subject for all Faculty of Electrical Engineering students at the Czech Technical University. According to the Stud		-
, ,			
-	Idents at CTU (Part III, Article 4), a compulsory subject is one "whose completion is a necessary condition in order to successfully co equires the "passing of an examination evaluated on the scale A, B, C, D, or E…" (SERR Part III, Article 6). II) According to the Comm		-
	equires the passing of an examination evaluated on the scale A, B, C, D, or E (SERR Part III, Article 6). II) According to the Comm juages (CEFR), an international standard for describing language ability, the definition of an English language learner who has achieve	-	
1			,
	can understand the main ideas of complex text on both concrete and abstract topics, including technical discussions in his/her field luency and spontaneity that makes regular interaction with native speakers quite possible without strain for either party. Can produce		
-	and explain a viewpoint on a topical issue giving the advantages and disadvantages of various options." III) Students who have succ		
	within the past five years may present their certificate to the Department of Languages, Faculty of Electrical Engineering. Upon appro-		inen exempi
	from both the Written Test and the Oral Part. For a list of approved international exams go the department website: http://jazyky.fel		
B0B16ET1	Ethic 1	KZ	4
	is to provide the students an orientation not only in general problems of ethics but above all to offer instructions for solving various situ		
	f the subject are discussions in which students can react to lectures but also to actual questions coming with news and look for the co		
B0B16FI1	Philosophy 1	KZ	4
We deal with th	e most important persons, schools and ideas of ancient philosophy. We are concerned especially on transdisciplinary nature of philos	ophy and connect	ion of old
	philosophical thoughts with recent problems of science, technology, economics and politics.		
B0B16FIL	Philosophy	ZK	2
We deal with th	e most important persons, schools and ideas of ancient philosophy. We are concerned especially on transdisciplinary nature of philos	ophy and connect	ion of old
	philosophical thoughts with recent problems of science, technology, economics and politics.		
B0B16HI1	History 1	KZ	4
B0B16HT1	History of science and technology 1	KZ	4
B0B16HTE	History of technology and economic	ZK	2
B0B16MPL	· · · · ·	ZK	2
	Psychology for managers		
B0B16MPS	Psychology	Z,ZK	4
B0B37NSI	Design of IoT systems	Z,ZK	5
B0B99PRPA	Procedural Programming	KZ	4
B2B02FY1	Physics 1	Z,ZK	8
	, of physics at the Faculty of Electrical Engineering - Physics 1, is devoted to the introduction into two important areas of physics. The first		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	-	-
studies. The classi	cal mechanics is followed by the relativistic mechanics, electric and magnetic field - both stationary as well as non-stationary. The stud	dents can use the	facts gained
	e study of electrical circuits, theory of electrotechnical materials or radioelectronics. Apart of this, the knowledge gained in this course		-
	consecutive course Physics 2.		
B2B02FY2	Physics 2	Z,ZK	7
	is 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		1
-	res - will give to the students basic insight into the properties of waves and will help to the students to understand that the presented of	-	
-	ter 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		
	nputer vision, measuring technique and will allow them to understand the principles of novel technologies and functioning of new elec		
B2B15UELA	Introduction to Electrical Engineering	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 re		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.		1
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		•
optical systems. St	udents extend their knowledge from the ray optics through the matrix optics, subsequently and further by the description of optical system	stems using Gaus	sian beams,
	towards wave and quantum optics. Then students will learn the basic mechanisms and principles of fiber optics.		
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	her both mobile ar	nd stationary
communicating sv	stems. Different types of radio modems are also built in the majority of electronic devices like PCs, tablets, notebooks, cameras, etc. W	ith expected fast of	development

is to teach all impo	s, operation of billions of wireless sensors is expected. The subject is common to all students of the Electronics and Communication stu	uuy program, its m	ain purpose
io to touon un impo	rtant aspects of this technical branch. Obtained knowledge should enable the students to design, project, adjust or manufacture any with	ireless communica	tion system
or its components. I	Besides wireless system analysis, the lectures include review of physical backgrounds, survey of the most important existing radio system	ns together with co	rresponding
	encies, description of electromagnetic wave propagation and related antennas. Instructions concerning propagation also cover behav		
	nside buildings. Lectures concerning analysis of typical wireless systems also cover description of related radio-frequency, microwave		
-	ises include practical calculations of wireless systems, computer analysis and synthesis of important structures and circuits, and related	ted laboratory mea	surements.
B2B17VDP	Transmission Lines for Data Transfer	Z,ZK	4
B2B31CZS	Digital Signal processing	Z,ZK	4
The subject gives	overview about basic methods of digital signal processing and their applications (examples from speech and biological signal process	sing): disrete-time	signals and
systems, signal c	haracteristics in time and frequency domain, Fourier transform, fast algorithms for DFT computation, introduction to digital filter desig	n, digital filtering ir	time and
	frequency domain, decimation and interpolation and their usage in filter banks, basics of LPC analysis. Further details can be found	d at <a< td=""><td></td></a<>	
	href=http://noel.feld.cvut.cz/vyu/ae2m99czs>http://noel.feld.cvut.cz/vyu/ae2m99czs		
B2B31EO1	Electronic Circuits 1	Z,ZK	4
The course introdu	ces basic circuits with operational amplifiers, continues with the description of linear systems, analysis of their characteristics and fundar	mentals of synthesi	s frequency
filters. It deals with	the principles and features of circuits for generating signals and a controlled oscillator including the PLL circuit and its use. The last p	art of the course is	devoted to
	basic amplifier stages with transistors.		
B2B31EO2	Electronic Circuits 2	Z,ZK	4
The course builds	on the basic electric circuits course. It introduces multistage transistor amplifiers and basic applications in the field of electronic syste	ms. Students beco	me familiar
with design and i	neasurement of electronic systems, including nonlinear applications with regard to the real characteristics of operational amplifiers. N	lext operating princ	ciples and
	parameters of power amplifiers, linear stabilizers, switching power supply and D/A and A/D converters are presents.		
B2B31ZEOA	Fundamentals of Electric Circuits	Z,ZK	5
B2B32DATA	Data Networks	KZ	5
	ces students with the fundamentals of data communication networks. The course objective is to provide broader understanding of var	I I	
	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.	, ,	
B2B32DITA	Digital Technique	KZ	4
	urse is to provide the introduction into designing and realization of digital circuits. First, necessary mathematical apparatus, such as th		-
-	and realization of logical functions is presented, followed by brief introduction into basics of logical circuits, such as the logical gates, f	-	-
	rt is dedicated mainly to modern designing techniques of digital circuits using programmable FPGA and VHDL language. During thes		-
	rous examples are evaluated to provide a complex insight into this hardware description language and modern methods of designing ar		
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 netwo	· · ·	-
	is systems are developed in model tasks focused on the design of selected parts of the telecommunications network. Special attentic		-
	telecommunications and to the business aspects of telecommunications.	0	0
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		-
	us methods to access common shared physical media, Ethernet switching technologies and WiFi networks and last but not least they		
		will also master a	n essential
networking theory i			
networking theory	as used in real practice. Students will be given a chance to get in touch with technology to implement simple routed and switched network lab.		
	as used in real practice. Students will be given a chance to get in touch with technology to implement simple routed and switched network lab.	vorks in the univer	sity network
B2B32TSI	as used in real practice. Students will be given a chance to get in touch with technology to implement simple routed and switched networks Telecommunication Systems and Networks	works in the univers	sity network
B2B32TSI	as used in real practice. Students will be given a chance to get in touch with technology to implement simple routed and switched networks lab. Telecommunication Systems and Networks oduces principles and functions of digital telecommunications systems, both transmission and switching systems as well as converge	works in the univers	sity network
B2B32TSI The course intr	as used in real practice. Students will be given a chance to get in touch with technology to implement simple routed and switched networks lab. Telecommunication Systems and Networks oduces principles and functions of digital telecommunications systems, both transmission and switching systems as well as converge interconnected into universal telecommunication networks.	works in the univers	sity network 4 systems
B2B32TSI The course intr B2B34ELPA	as used in real practice. Students will be given a chance to get in touch with technology to implement simple routed and switched networks lab. Telecommunication Systems and Networks oduces principles and functions of digital telecommunications systems, both transmission and switching systems as well as converge interconnected into universal telecommunication networks. Electron Devices	KZ KZ d packet-oriented Z,ZK	sity network 4 systems 5
B2B32TSI The course intr B2B34ELPA This course introdu	as used in real practice. Students will be given a chance to get in touch with technology to implement simple routed and switched networks lab. Telecommunication Systems and Networks oduces principles and functions of digital telecommunications systems, both transmission and switching systems as well as converge interconnected into universal telecommunication networks. Electron Devices uces the basic theory, principles of operation and properties of electron devices. Physical principles of operation, device structures and	KZ KZ d packet-oriented Z,ZK d characteristics ar	sity network 4 systems 5 e explained
B2B32TSI The course intr B2B34ELPA This course introdu together with adeq	as used in real practice. Students will be given a chance to get in touch with technology to implement simple routed and switched networks ab. Telecommunication Systems and Networks oduces principles and functions of digital telecommunications systems, both transmission and switching systems as well as converge interconnected into universal telecommunication networks. Electron Devices uces the basic theory, principles of operation and properties of electron devices. Physical principles of operation, device structures and uate models for small- and large-signal. Basic applications in analogue and digital electronics are examined. In seminars and labs, stu	KZ d packet-oriented C,ZK d characteristics ar udents are introduc	sity network 4 systems 5 e explained ced to basic
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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 tech	nnology of radio a	nd television
	production and broadcasting. Laboratory exercises are situated in a small school studio and are completed with professional excu	irsions.	
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	vith principles of t	heir correct
application and ac	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.	he fundamentals	of magnetic
B2B99EKP	Electronics and communication practically	KZ	4
The course is deve	oted to practical experiments with the ESP 32 SoC board and a set of external add-on modules. Students will get acquainted with the	rules of applicati	on design in
ArduinoIDE and Vis	sual Code Studio using libraries for operating internal and external peripherals. Sample applications are focused on standardized issu	es that cover the	professional
focus of the Elect	tronics and Communications program. Part of the exercise will be devoted to the description of the design of printed circuit boards, the	eir production and	I mounting.
	Students will get a board with SoC ESP32 for experimentation, which they can also use for home preparation.		
B2B99PPC	Practical C/C++ programming	KZ	6
The course introduc	ces students to the C++ and develops their practical skills in programming in C/C++ with an emphasis on solving computational tasks a	nd multi-threaded	l applications
using parallel progr	ramming. The first part of the course is devoted to the object-oriented programming in C++ and provides students with basic data contain	ainers of standard	l library STL.
	principles of parallel programming, multi-threaded applications, synchronization mechanisms and models of multi-threaded applications		
	prithmic thinking to solve computational problems by searching the problem state space. Two main approaches are considered: the de		
representation of t	the state space; and local optimization techniques. Additionally, students will be familiarized with models of arbitrary precision data rep	aragantations rar	presentation
representation of t			
-	of matrices, and matrix calculations.		
B2B99TPS	of matrices, and matrix calculations. Technical Writing	KZ	4
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