## Study plan

## Name of study plan: Electrical Engineering, Power Engineering and Management

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: Electrical Engineering, Power Engineering and Management

Type of study: Bachelor full-time

Required credits: 172 Elective courses credits: 8 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: 155

The role of the block: P

Code of the group: 2015\_BEEMBAP Name of the group: Bachelor Project

Requirement credits in the group: In this group you have to gain 15 credits Requirement courses in the group: In this group you have to complete 1 course

Credits in the group: 15 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
BBAP15	Bachelor thesis	Z	15	15s	L,Z	Р

Characteristics of the courses of this group of Study Plan: Code=2015\_BEEMBAP Name=Bachelor Project

RRAD15 Rachelor thesis 7 15						
DBAL 13 Dactieiot triesis	BBAP15	Bachelor thesis			Z	15

Code of the group: 2015\_BEEMBBE

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

Basic health and occupational safety regulations

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 Radek Havlí ek Vladimír K la (Gar.)	Z	0	2BP+2BC	Z,L	Р
BEZZ	Basic health and occupational safety regulations Ivana Nová, Radek Havlí ek, Vladimír K la Radek Havlí ek Vladimír K la (Gar.)	Z	0	2BP+2BC	Z	Р

Characteristics of the courses of this group of Study Plan: Code=2015\_BEEMBBE Name=Safety of the bachelor's studies

BEZB Safety in Electrical Engineering for a bachelor's degree Z 0

The purpose of the safety course is to give the students basic knowledge of electrical equipment and installation as to avoid danger arising from operation of it. This introductory course contains fundamentals of Safety Electrical Engineering. In this way the students receive qualification of instructed person that enables them to work on electrical equipment.

The guidelines were worked out based on The Training Scheme for Health and Occupational Safety designed for employees and students of the Czech Technical University in Prague, which was provided by the Rector's Office of the CTU. Safety is considered one of the basic duties of all employees and students. The knowledge of Health and Occupational Safety regulations forms an integral and permanent part of qualification requirements. This program is obligatory.

Code of the group: 2015\_BEEMH

Name of the group: Humanities subjects

Requirement credits in the group: In this group you have to gain at least 4 credits (at most 28)

Requirement courses in the group: In this group you have to complete at least 1 course (at most 9)

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
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 (Gar.)	ZK	2	2P+0S	Z,L	Р
B0B16FI1	Philosophy 1 Peter Zamarovský Peter Zamarovský (Gar.)	KZ	4	2P+2S	Z	Р
B0B16HTE	History of technology and economic  Marcela Efmertová, Jan Mikeš Marcela Efmertová (Gar.)	ZK	2	2P+0S	Z,L	Р
B0B16HT1	History of science and technology 1 Marcela Efmertová, Jan Mikeš Marcela Efmertová (Gar.)	KZ	4	2P+2S	Z	Р
B0B16HI1	History 1 Milena Josefovi ová Milena Josefovi ová Milena Josefovi ová (Gar.)	KZ	4	2P+2S	Z	Р
B0B16MPS	Psychology Jan Fiala Jan Fiala (Gar.)	Z,ZK	4	2P+2S	Z,L	Р
B0B16MPL	Psychology for managers Jan Fiala Jan Fiala (Gar.)	ZK	2	2P+0S	Z,L	Р
A003TV	Physical Education	Z	2	0+2	L,Z	Р

Characteristics of the courses of this group of Study Plan: Code=2015\_BEEMH Name=Humanities subjects

B0B16ET1	Ethic 1	KZ	4		
Aim of this subject is to	provide the students an orientation not only in general problems of ethics but above all to offer instructions for solving various	situations of hum	an life. Essential		
parts of the subject are	al answers.				
B0B16FIL	Philosophy	ZK	2		
We deal with the most	sophy and conne	ction of old			
philosophical thoughts	with recent problems of science, technology, economics and politics.				
B0B16FI1	B0B16FI1 Philosophy 1				
We deal with the most	important persons, schools and ideas of ancient philosophy. We are concerned especially on transdisciplinary nature of philo	sophy and conne	ction 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	KZ	4		
B0B16HI1	History 1	KZ	4		
B0B16MPS	Psychology	Z,ZK	4		
B0B16MPL	Psychology for managers	ZK	2		
A003TV	Physical Education	Z	2		

Code of the group: 2015\_BEEMP

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 26 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
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	Р
B1B38EMA	Electrical Measurements Jakub Svatoš Jakub Svatoš (Gar.)	KZ	5	2P+2L	L	Р
B1B31EOS	Electric circuits  Martin Pokorný, Michal Šimek Martin Pokorný Martin Pokorný (Gar.)	Z,ZK	6	3P+2S	Z	Р
B1B15EN1	Power Engineering 1	Z,ZK	6	3P+2S	L	Р
B1B15EN2	Power Engineering 2 Ivo Doležel, Zden k Müller	Z,ZK	5	2P+2L	Z	Р
B1B17EMP	Electromagnetic Field Vít zslav Pankrác Vít zslav Pankrác (Gar.)	Z,ZK	5	2P+2C	Z	Р

B1B34EPS	Vladimír Janí ek, Adam Bou a, Jan Novák, Tomáš Teplý, Tomáš Martan Vladimír Janí ek Vladimír Janí ek (Gar.)	KZ	4	2P+2L	Z	Р
B1B02FY1	Physics 1 Petr Koní ek Petr Koní ek (Gar.)	Z,ZK	8	4P+1L+2C	L	Р
B1B02FY2	Physics 2 Petr Koní ek Petr Koní ek (Gar.)	Z,ZK	7	3P+1L+2C	Z	Р
B0B01KAN	Complex Analysis Zden k Mihula, Hana Tur inová, Martin Bohata Martin Bohata Martin Bohata (Gar.)	Z,ZK	5	2P+2S	Z	Р
B0B01LAG	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	8	4P+2S	Z	Р
B0B16MME	Macro and Microekonomics	Z,ZK	4	2P+2S	Z	Р
B0B01MA1	Mathematical Analysis 1 Josef Dvo ák, Martin K epela, Josef Tkadlec, Veronika Sobotíková Josef Tkadlec Josef Tkadlec (Gar.)	Z,ZK	7	4P+2S	Z,L	Р
B0B01MA2	Mathematical Analysis 2 Karel Pospíšil, Hana Tur inová, Martin Bohata, Miroslav Korbelá, Petr Hájek, Jaroslav Tišer, Paola Vivi <b>Petr Hájek</b> Jaroslav Tišer (Gar.)	Z,ZK	7	4P+2S	L,Z	Р
B1B13MVE	Materials for Power Electrical Engineering	Z,ZK	5	2P+2L	Z	Р
B0B99PRP	Procedural Programming	Z,ZK	6	2P+2C	Z	Р
B1BPROJ4	Bachelor project Jan Mikeš, Zden k Müller, Jan Kyncl, Jan Bauer, Ivana Beshajová Pelikánová, Karel Künzel, Vít Klein, Stanislav Bou ek, Ji í Vaší ek, Jan Bauer Jan Bauer (Gar.)	Z	4	4s	Z,L	Р
B1B13PPS	Industrial computer systems Karel Künzel Karel Künzel (Gar.)	Z,ZK	4	2P+2L	L	Р
B0B01STP	Statistics and Probability Miroslav Korbelá, Kate ina Helisová, Jakub Stan k, Bogdan Radovi Kate ina Helisová Kate ina Helisová (Gar.)	Z,ZK	5	2P+2S	L	Р
B1B13VST	Technology in Electrical Engineering	Z,ZK	5	3P+2L	L	Р
B1B15VYA	Computational Applications Jan Kyncl Jan Kyncl (Gar.)	KZ	4	2P+2C	L	Р
B1B13VVZ	Manufacturing of Power Devices	Z,ZK	5	2P+2L	Z	Р
B1B14ZPO	Fundametals of Electric Drives Pavel Kobrle Pavel Kobrle	Z,ZK	5	2P+2L	Z	Р
B1B14ZSP	Electric Machines and Apparatuses Basics Pavel Kobrle, Pavel Mindl Pavel Kobrle Pavel Kobrle (Gar.)	Z,ZK	5	3P+2L	L	Р
B1B14ZEL	Fundamentals of Electrotechnical Engineering	KZ	3	2P+2C	Z	Р
B1B14ZVE	Power Electronics Jan Bauer, Ji í Lettl Ji í Lettl (Gar.)	Z,ZK	4	2P+2L	Z	Р
	e courses of this group of Study Plan: Code=2015_BEEMP Nam	e=Compuls	ory sub			
This course introduces stude	fferencial Equations and Numerical Analysis ents to the classical theory of ordinary differential equations (separable and linear ODEs of algebraic and differential equations and their systems). The course takes advantage	•		rical methods	•	
	ectrical Measurements	S. the symmony	2011100111		KZ	5
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**Elektronics for Heavy-current engeneering** 

Characteristics of	the courses of this group of Study Plan: Code=2015_BEEMP Name=Compulsory subjects	of the progr	amme					
B0B01DRN	Differencial Equations and Numerical Analysis	Z,ZK	4					
This course introduces	students to the classical theory of ordinary differential equations (separable and linear ODEs) and also to bsics of numerical m	nethods (errors in	calculations and					
stability, numerical solutions of algebraic and differential equations and their systems). The course takes advantage of the synnergy between theoretical and practical point of view.								
B1B38EMA	Electrical Measurements	KZ	5					
The subject is focused to	The subject is focused to fundamentals of measurement and instrumentation. Based on the principle of the methods of electrical quantities measurement (voltage, current, power,							
frequency, resistance, o	apacitance and inductance) a structure and properties of measuring instruments are explained including principles of their co	rrect application	and an accuracy					
estimation. Fundamenta	Ils of magnetic measurements close the course.							
B1B31EOS	Electric circuits	Z,ZK	6					
The subject describes f	ndamental methods of electrical circuit analysis. The aim is to unify different level of knowledge of students coming from sci	ools of different o	ategories and					
form the basis of knowle	dge necessary for next subjects. It presents the difference among physical circuit and its models, and then it presents the beha	vior of basic ideal	circuit elements					
in DC circuits and in sin	isoidal steady state as well as transients, caused by changes in the circuit. Acquired knowledge should, among other things, al	so be used for cri	tical assessment					
of the results of the ana	lysis and simulation of electrical circuits by means of software tools.							
B1B15EN1	Power Engineering 1	Z,ZK	6					
B1B15EN2	Power Engineering 2	Z,ZK	5					
B1B17EMP	Electromagnetic Field	Z,ZK	5					
This course gets its stu	dents acquinted with principles and applied electromagnetic field theory basics.							
B1B34EPS	Elektronics for Heavy-current engeneering	KZ	4					
Knowledge of current b	asic passive and active electronic components. Structure, physical and circuit properties of components. Component behavio	r when working w	ith both small					
and large analog, digita	and optical signals. More complex circuit systems and communication technologies. Measuring the most important applicati	ons of modern se	miconductor					
devices.								
B1B02FY1	Physics 1	Z,ZK	8					
The basic course of phy	sics at the Faculty of Electrical Engineering - Physics 1, is devoted to the introduction into two important areas of physics. The	first one is a clas	sical mechanics					
and the second one is the electric and magnetic field. Within the framework of the classical mechanics, the students study the particle kinematics; dynamics of the mass particle, system								

of mass particles and rigid bodies. The students should be able to solve basic problems dealing with the description of mechanical systems, which they can meet during their further studies. The classical mechanics is followed by the relativistic mechanics, electric and magnetic field - both stationary as well as non-stationary. The students can use the facts gained in this course in the study of electrical circuits, theory of electrotechnical materials or radioelectronics. Apart of this, the knowledge gained in this course is required for the study of the

consecutive course Physics 2.

B1B02FY2	Physics 2	Z,ZK	7
The course Physics 2	is closely linked with the course Physics 1. Within the framework of this course the students will first of all learn foundations	of thermodynamics. F	Following topic
- the theory of waves -	will give to the students basic insight into the properties of waves and will help to the students to understand that the prese	nted description of th	e waves has a
universal character in	spite of the waves character. Particular types of waves, such as acoustic or optical waves are the subjects of the following so	ection. Quantum mec	hanics and
nuclear physics will co	mplete the student?s general education in physics. The knowledge gained in this course will help to the students in study of	such modern areas	as robotics,
computer vision, meas	suring technique and will allow them to understand the principles of novel technologies and functioning of new electronic dev	rices.	
B0B01KAN	Complex Analysis	Z,ZK	5
B0B01LAG	Linear Algebra	Z,ZK	8
The course covers the	initial parts of linear algebra. Firstly, the basic notions of a linear space and linear mappings are covered (linear dependence ar	nd independence, bas	is, coordinates,
•	atrices (determinants, inverse matrices, matrices of a linear map, eigenvalues and eigenvectors, diagonalisation, etc) is cov	ered next. The applic	ations include
solving systems of line	ar equations, the geometry of a 3D space (including the scalar product and the vector product) and SVD.		
B0B16MME	Macro and Microekonomics	Z,ZK	4
	market, law of demand, law of supply, market equilibrium, price regulation, price and income elasticities, consumer's behavior		
•	nonopoly, government macroeconomic policy, gross domestic product, multipliers, money, inflation, banking system, moneta	ry policy, labor marke	et, business
	eign trade policy, comparative advantage, CR and EU, Euro.		
B0B01MA1	Mathematical Analysis 1	Z,ZK	7
The aim of the course	is to introduce students to basics of differential and integral calculus of functions of one variable.		
B0B01MA2	Mathematical Analysis 2	Z,ZK	7
	introduction to the differential and integral calculus in several variables and basic relations between curve and surface integral	rals. Other part conta	ins function
•	es with application to Taylor and Fourier series.		
B1B13MVE	Materials for Power Electrical Engineering	Z,ZK	5
	ription of basic properties and basic types of materials for electrical engineering is carried out. Types of conductors, superco		-
	ductors, which are used in power electrical engineering, are presented. The stress is put on relationships between properties		
	gher detail, with ceramics for electrical engineering, with properties of mica, glass and their applications, with environmenta	I conductive joining, v	vith materials
	and with selected nanomaterials and their applications.		
B0B99PRP	Procedural Programming	Z,ZK	6
B1BPROJ4	Bachelor project	Z	4
B1B13PPS	Industrial computer systems	Z,ZK	4
The cubiect is focused			•
	on basic knowledges about computer control systems used in electrotechnic engineering and energetics. Students works with the control of the	ith hardware for data	acquisition and
data processing, softw	vare tools and application examples. There are presented elementary digital circuits, the representation of numbers and their	ith hardware for data r processing in micro	acquisition and computer and
data processing, softw fundamental block of r	rare tools and application examples. There are presented elementary digital circuits, the representation of numbers and their incroprocessor and microcomputer. The single chip microcomputer, embedded application, industrial PC and design to industrial PC	ith hardware for data r processing in microo strial condition are pr	acquisition and computer and esented.
data processing, softw fundamental block of r B0B01STP	vare tools and application examples. There are presented elementary digital circuits, the representation of numbers and their inicroprocessor and microcomputer. The single chip microcomputer, embedded application, industrial PC and design to industrial Statistics and Probability	ith hardware for data r processing in microo strial condition are pr	acquisition and computer and esented.
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data processing, softw fundamental block of r B0B01STP B1B13VST Production systems in and impregnation prod technologies using pla B1B15VYA	rare tools and application examples. There are presented elementary digital circuits, the representation of numbers and their incroprocessor and microcomputer. The single chip microcomputer, embedded application, industrial PC and design to industriation and Probability  Technology in Electrical Engineering electrical engineering will be characterized, their arrangement and basic technologies for mechanical joints and plastic part dessess will also been presented. Next part of a course will be focused on basic technologies for semiconductors including possum, packaging and basic assembly technologies will also been presented.  Computational Applications	ith hardware for data r processing in micror strial condition are pr Z,ZK Z,ZK s. Manufacturing of w wer integration. Bear	acquisition and computer and esented.  5 5 rindings,drying n technologies,
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Code of the group: 2015\_BZAJ

Name of the group: Exam from the english language

Requirement credits in the group:

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

Credits in the group: 0 Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
B0B04B1K	English language B1 - classified assessment Markéta Havlí ková, Pavla Péterová, Erik Peter Stadnik, Michael Ynsua, Dana Saláková, Petra Juna Jennings Petra Juna Jennings (Gar.)	KZ	0	0C	Z,L	Р

B0B04B2Z	English language B2 - exam Michael Ynsua, Dana Saláková, Petra Juna Jennings Petra Juna Jennings	Z,ZK	0	0C	Z,L	Р
	Petra Juna Jennings (Gar.)					i

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

B0B04B1K	B0B04B1K English language B1 - classified assessment						
verifying of the studen	t's skills of B1 level						
B0B04B2Z	English language B2 - exam	Z.ZK	0				

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

Name of the block: Compulsory courses of the specialization

Minimal number of credits of the block: 13

The role of the block: PO

Code of the group: 2015\_BEEMPO1

Name of the group: Compulsory subjects of the branch

Requirement credits in the group: In this group you have to gain 13 credits

Requirement courses in the group: In this group you have to complete 3 courses

Credits in the group: 13 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
B1B13SEZ	Electrochemical Sources and Photovoltaics	Z,ZK	4	2P+2L	L	РО
B1B15EN3	Power Engineering 3 Jan Kyncl, Petr Žák, Petr Žák Jan Kyncl (Gar.)	KZ	4	2P+2L	Z	РО
B1B14MIS	Microprocessors for Power Systems  Jan Bauer Jan Bauer Ji í Zd nek (Gar.)	Z,ZK	5	2P+2L	Z	PO

## Characteristics of the courses of this group of Study Plan: Code=2015\_BEEMPO1 Name=Compulsory subjects of the branch

B1B13SEZ	Electrochemical Sources and Photovoltaics	j Z,ZK	4	ı
The course familiarizes	students with the basic principles of electrochemical sources and photovoltaic cells and systems. At the beginning, the emph	asis is on underst	anding the basic	ı
principle using the equiv	alent circuits and mathematical description. In the next section, the basic types of electrochemical sources and their technical p	arameters are exp	olored separately.	ı
Similarly, students beco	me familiar with the technology of photovoltaic cells and modules. Another chapter is devoted to the basic applications such	as solar-thermal.	At the end of the	ı
course students become	e familiar with economical and technological implications of the combination of solar systems and electrochemical sources			1

B1B15EN3	Power Engineering 3	KZ	4
B1B14MIS	Microprocessors for Power Systems	Z.ZK	5

Power electronics control computer structure, digital signal processor and ALU added features for fast real time calculations. Interrupt system and DMA system, analog signal measurement, fast impulse signal measurement, fast impulse generation support, inter-computer communication, system and power management, programming languages for power systems software development, programming techniques, software development tools (simulators, emulators, monitors), input signal conditioning circuitry, conversion from analog signals to digital processing, time sampling, amplitude quatization, power electronics control block design and implementation, difference equations and control algorithms, fixed and floating point calculations, debugging methods, program parametrization, guides and rules for implementation and application of power system control computers. Real time operating system, scheduler, dispatcher and another features and guides for application

Name of the block: Compulsory elective courses

Minimal number of credits of the block: 4

The role of the block: PV

Code of the group: 2015\_BEEMPV

Name of the group: Compulsory subjects of the programm

Requirement credits in the group: In this group you have to gain at least 4 credits (at most 12)

Requirement courses in the group: In this group you have to complete at least 1 course (at most 3)

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
B1B15EPR	Projects in Power Engineering	KZ	4	2P+2S	L	PV
B1B13PTE	Advanced technology in electrical engineering	Z,ZK	4	2P+2L	L	PV
B1B14TME	Engineering mechanics	Z,ZK	4	2P+2C	L	PV

Characteristics of the courses of this group of Study Plan: Code=2015\_BEEMPV Name=Compulsory subjects of the programm

B1B15EPR	Projects in Power Engineering	KZ	4
B1B13PTE	Advanced technology in electrical engineering	Z,ZK	4

The topic of subject is oriented on selected materials and technics which are offering a new properties and facilities to electrical products. New superconductive materials, special pure polymers and their composites, materials with memory of form, inteligent polymers, materials and structures based on nanoparticles. Selected types of beam technics and their use in practice.

B1B14TME Engineering mechanics

Z,ZK

This course provides knowledge of applied mechanics for the industry practice. Analysis of constructional elements and their dimensioning. Kinematics of simple mechanisms. Dynamic behaviour of mechanical systems, mechanic vibrations. Thermodynamics of real gases and vapours, their processes an cycles, basic comparative cycles of heat machines. Fundamentals of hydrodynamics, transport losses in hydraulic systems.

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 g	roup.					
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	Г	V
B0B04B11	English Language B1-1 Petra Juna Jennings Petra Juna Jennings (Gar.)	Z	0	2C	Z	V
B0B04B12	English Language B1-2 Petra Juna Jennings Petra Juna Jennings (Gar.)	Z	0	2C	L	V
B0B04B21	English Language B2-1 Petra Juna Jennings Petra Juna Jennings (Gar.)	Z	3	2C	Z	V
B0B04B22	English Language B2-2 Petra Juna Jennings (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	students 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	students who are beginners in their second foreign language. The course objective is to develop and sustain their basic knowled	ledge of the Engli	sh language.
B0B04B11	English Language B1-1	Z	0
Course objective: Broa	dening 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: Broa	dening the basic knowledge of general English; mastering basic specialised language; focusing on text analysis and vocabulary	expansion; unde	standing spoken
English.			
B0B04B21	English Language B2-1	Z	3
This course is designe	d as a full-year, two semester preparation course for the university's compulsory B2-level English Examination (Anglický jazyk	B2 - zkouška - B0	B04B2Z*) While
the course is focused	on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mari	k), it also focuses	more on the
academic and technica / International Study.	al vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appro	priate level of Eng	lish for Erasmus
B0B04B22	English Language B2-2	Z	3
1	discretification for the contraction of the state of the contraction o		004007 *\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\

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 - B0B04B2Z \*). While the course is focused on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), 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 appropriate level of English 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

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

Code of the group: BTVK

Name of the group: Physical education courses

Requirement credits in the group: Requirement courses in the group:

Credits in the group: 0 Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
TVKLV	Physical Education Course	Z	0	7dní	L	V
TVKZV	Physical Education Course	Z	0	7dní	Z	V

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

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

Code of the group: 2015\_BEEMVOL 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	This course introduces students to the classical theory of ordinary differential equations (separable and linear ODEs) and also to bsics of numerical methods (errors in calculations and					
stability, numerical solutions of algebraic and differential equations and their systems). The course takes advantage of the synnergy between theoretical and practical point of view.						
B0B01KAN	Complex Analysis	Z,ZK	5			

B0B01LAG					
The service services	Linear Algebra	Z,ZK	8		
	he initial parts of linear algebra. Firstly, the basic notions of a linear space and linear mappings are covered (linear dependence and independence).				
etc). The calculus of matrices (determinants, inverse matrices, matrices of a linear map, eigenvalues and eigenvectors, diagonalisation, etc) is covered next. The applications include solving systems of linear equations, the geometry of a 3D space (including the scalar product and the vector product) and SVD.					
B0B01MA1	Mathematical Analysis 1	Z,ZK	7		
20201111111	The aim of the course is to introduce students to basics of differential and integral calculus of functions of one variable.	_,,			
B0B01MA2	Mathematical Analysis 2	Z,ZK	7		
The subject covers an introduction to the differential and integral calculus in several variables and basic relations between curve and surface integrals. Other part contains function					
	series and power series with application to Taylor and Fourier series.				
B0B01STP	Statistics and Probability	Z,ZK	5		
B0B04A21	English Language A2-1	Z			
B0B04400	The course is open to students who are beginners in their second language. Course objective: Achieving competence in basic E				
B0B04A22	English Language A2-2	Z	0		
B0B04B11	en to students who are beginners in their second foreign language. The course objective is to develop and sustain their basic knowle  English Language B1-1	Z	0		
	roadening the basic knowledge of general English; mastering basic specialised language; focusing on text analysis and vocabulary exp	_	_		
200.00 00,000.00	English.		amig oponom		
B0B04B12	English Language B1-2	Z	0		
Course objective: B	roadening the basic knowledge of general English; mastering basic specialised language; focusing on text analysis and vocabulary exp	oansion; understan	ding spoken		
	English.				
B0B04B1K	English language B1 - classified assessment	KZ	0		
	verifying of the student's skills of B1 level	1	ı		
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-		-		
	ised on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark) nical vocabulary and grammar expected of students at the university level. *NOTE:This exam is also used for determining an appropria				
academic and teem	/ International Study.	ate level of English	ioi Liasilias		
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 -	zkouška - B0B04E	l .		
the course is foci	used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark)	, it also focuses m	ore on the		
academic and tech	nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropria	ate level of English	for Erasmus		
	/ International Study.				
B0B04B2Z	English language B2 - exam	Z,ZK	0		
	xam is a compulsory subject for all Faculty of Electrical Engineering students at the Czech Technical University. According to the Students at CTU (Part III, Article 4), a compulsory subject is one "whose completion is a necessary condition in order to successfully condition in order to successfully condition in order to successfully conditions.	-			
_		implete the study p	nogramme.		
in addition, this re	equires the "passing of an examination evaluated on the scale A. B. C. D. of E" (SERR Part III. Article 6). II) According to the Comr	mon European Fra	mework of		
	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 Comr uages (CEFR), an international standard for describing language ability, the definition of an English language learner who has achieve	-			
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universal character in spite of the waves character. Particular types of waves, such as acoustic or optical waves are the subjects of the following section. Quantum mechanics and nuclear physics will complete the student?s general education in physics. The knowledge gained in this course will help to the students in study of such modern areas as robotics, computer vision, measuring technique and will allow them to understand the principles of novel technologies and functioning of new electronic devices. Materials for Power Electrical Engineering B1B13MVF At first a physical description of basic properties and basic types of materials for electrical engineering is carried out. Types of conductors, superconductors, insulators, magnetic materials and semiconductors, which are used in power electrical engineering, are presented. The stress is put on relationships between properties, technology and the use. The student will meet, in higher detail, with ceramics for electrical engineering, with properties of mica, glass and their applications, with environmental conductive joining, with materials for thin and thick films and with selected nanomaterials and their applications. B1B13PPS Industrial computer systems The subject is focused on basic knowledges about computer control systems used in electrotechnic engineering and energetics. Students works with hardware for data acquisition and data processing, software tools and application examples. There are presented elementary digital circuits, the representation of numbers and their processing in microcomputer and fundamental block of microprocessor and microcomputer. The single chip microcomputer, embedded application, industrial PC and design to industrial condition are presented. B1B13PTE Advanced technology in electrical engineering Z,ZK The topic of subject is oriented on selected materials and technics which are offering a new properties and facilities to electrical products. New superconductive materials, special pure polymers and their composites, materials with memory of form, inteligent polymers, materials and structures based on nanoparticles. Selected types of beam technics and their use in practice. Electrochemical Sources and Photovoltaics B1B13SEZ The course familiarizes students with the basic principles of electrochemical sources and photovoltaic cells and systems. At the beginning, the emphasis is on understanding the basic principle using the equivalent circuits and mathematical description. In the next section, the basic types of electrochemical sources and their technical parameters are explored separately. Similarly, students become familiar with the technology of photovoltaic cells and modules. Another chapter is devoted to the basic applications such as solar-thermal. At the end of the course, students become familiar with economical and technological implications of the combination of solar systems and electrochemical sources. B1B13VST Technology in Electrical Engineering Production systems in electrical engineering will be characterized, their arrangement and basic technologies for mechanical joints and plastic parts. Manufacturing of windings, drying and impregnation processes will also been presented. Next part of a course will be focused on basic technologies for semiconductors including power integration. Beam technologies, technologies using plasma, packaging and basic assembly technologies will also been presented. B1B13VVZ Manufacturing of Power Devices 7.7K 5 The topic of the subject is focused on manufacturing of power electrical machines and devices from construction and technological point of wiev. Main part of the subject is devoted to transformers and rotating machines, namely their magnetic circuits and windings. Second half of the subject is dedicated to manufacturing of power semiconductive devices and converters including diagnostics, reliable operation. Last part of lectures deals with layouts of manufactirung, lean management and planning of manufacturing. Microprocessors for Power Systems B1B14MIS Power electronics control computer structure, digital signal processor and ALU added features for fast real time calculations. Interrupt system and DMA system, analog signal measurement, fast impulse signal measurement, fast impulse generation support, inter-computer communication, system and power management, programming languages for power systems software development, programming techniques, software development tools (simulators, emulators, monitors), input signal conditioning circuitry, conversion from analog signals to digital processing, time sampling, amplitude quatization, power electronics control block design and implementation, difference equations and control algorithms, fixed and floating point calculations, debugging methods, program parametrization, quides and rules for implementation and application of power system control computers. Real time operating system, scheduler, dispatcher and another features and guides for application B1B14TME Engineering mechanics Z.ZK This course provides knowledge of applied mechanics for the industry practice. Analysis of constructional elements and their dimensioning. Kinematics of simple mechanisms. Dynamic behaviour of mechanical systems, mechanic vibrations. Thermodynamics of real gases and vapours, their processes an cycles, basic comparative cycles of heat machines. Fundamentals of hydrodynamics, transport losses in hydraulic systems. B1B14ZEL Fundamentals of Electrotechnical Engineering ΚZ 3 The course extends necessary knowledge of the technical documentation, technical text and its presentation. The second half of the semester isfocused on an explanation and practicing of basics electrotechnics so that knowledge of students are increased to the level needed in the next semesters. B1B14ZPO Z,ZK 5 Fundametals of Electric Drives The course provides the basic terms and knowledge in electric drives and in the issues related to this discipline as well. The lectures are focused on the basic of electric drives logic control, continuous control and also discrete control, and on the characteristics of used controllers in practice. Further, the basic control structures of drives with DC and AC machines are explained. B1B14ZSP Electric Machines and Apparatuses Basics Z,ZK 5 The course explains the principles of machines for convertsion of mechanical energy to electrical and back. It discusses the principles of basic functions and properties of rotating and non-rotating electric machines. Following the behavior of electrical machines are discussed basic devices for protection and switching, including behavioral and switching problems. Power Electronics The course focuses on the basic types of power semiconductor converters, which are used to change the parameters of electricity. Students are introduced to the basic principles properties and applications of power electronic converters, their advantages, disadvantages, and fuse sizing B1B15EN1 Power Engineering 1 Z.ZK 6 B1B15EN2 Power Engineering 2 Z.ZK 5 Power Engineering 3 ΚZ 4 **B1B15EN3** B1B15EPR Projects in Power Engineering ΚZ 4 Computational Applications B1B15VYA ΚZ 4 Electromagnetic Field B1B17EMP Z,ZK 5 This course gets its students acquinted with principles and applied electromagnetic field theory basics. B1B31EOS Z.ZK Electric circuits 6 The subject describes fundamental methods of electrical circuit analysis. The aim is to unify different level of knowledge of students coming from schools of different categories and form the basis of knowledge necessary for next subjects. It presents the difference among physical circuit and its models, and then it presents the behavior of basic ideal circuit elements in DC circuits and in sinusoidal steady state as well as transients, caused by changes in the circuit. Acquired knowledge should, among other things, also be used for critical assessment of the results of the analysis and simulation of electrical circuits by means of software tools. B1B34EPS ΚZ Elektronics for Heavy-current engeneering 4 Knowledge of current basic passive and active electronic components. Structure, physical and circuit properties of components. Component behavior when working with both small and large analog, digital and optical signals. More complex circuit systems and communication technologies. Measuring the most important applications of modern semiconductor devices.

B1B38EMA	Electrical Measurements	KZ	5		
The subject is focused to fundamentals of measurement and instrumentation. Based on the principle of the methods of electrical quantities measurement (voltage, current, power,					
frequency, resistance, capacitance and inductance) a structure and properties of measuring instruments are explained including principles of their correct application and an accuracy					
estimation. Fundamentals of magnetic measurements close the course.					
B1BPROJ4	Bachelor project	Z	4		
BBAP15	Bachelor thesis	Z	15		
BEZB	Safety in Electrical Engineering for a bachelor's degree	Z	0		
The purpose of the safety course is to give the students basic knowledge of electrical equipment and installation as to avoid danger arising from operation of it. This introductory course					
contains fundamentals of Safety Electrical Engineering. In this way the students receive qualification of instructed person that enables them to work on electrical equipment.					
BEZZ	Basic health and occupational safety regulations	Z	0		
The guidelines were worked out based on The Training Scheme for Health and Occupational Safety designed for employees and students of the Czech Technical University in Prague,					
which was provided by the Rector's Office of the CTU. Safety is considered one of the basic duties of all employees and students. The knowledge of Health and Occupational Safety					
regulations forms an integral and permanent part of qualification requirements. This program is obligatory.					
TV-V1	Physical education	Z	1		
TVKLV	Physical Education Course	Z	0		
TVKZV	Physical Education Course	Z	0		
TVV	Physical education	Z	0		
TVV0	Physical education	Z	0		

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