Study plan

Name of study plan: Cybernetics and Robotics 2016

Faculty/Institute/Others:

Department:

Branch of study guaranteed by the department: Common courses

Garantor of the study branch: Program of study: Welcome page Type of study: unknown full-time

Required credits: 174
Elective courses credits: 6
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: 154

The role of the block: P

Code of the group: 2015_BKYRBAP Name of the group: Bachelor Project

Requirement credits in the group: In this group you have to gain 16 credits Requirement courses in the group: In this group you have to complete 1 course

Credits in the group: 16 Note on the group:

	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
BBAP16	Bachelor Thesis	Z	16	15s	L,Z	Р

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

DDAD46 Decholor Thesis 7 46					
BBAP 10 Bacheloi mesis Z 10	BBAP16	Doobolar Thoois		Z	16

Code of the group: 2015_BKYRBBE

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_BKYRBBE 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_BKYRP

Name of the group: Compulsory subjects of the programme

Requirement credits in the group: In this group you have to gain 138 credits

Requirement courses in the group: In this group you have to complete 25 courses

Credits in the group: 138

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
B3B04PSA	Academic Writing Petra Juna Jennings, Jitka Pinková Jitka Pinková Petra Juna Jennings (Gar.)	KZ	2	2C	Z	Р
B3B33ALP	Algorithms and Programming Vojt ch Vonásek Vojt ch Vonásek (Gar.)	Z,ZK	6	2P+2C	Z	Р
B0B35APO	Computer Architectures Petr Št pán, Pavel Píša, Richard Šusta Pavel Píša Pavel Píša (Gar.)	Z,ZK	5	2P+2L	L	Р
B3B35ARI	Automatic Control	Z,ZK	7	4P+2L	L	Р
B0B01DRN	Differencial Equations and Numerical Analysis Petr Habala, Jakub Rondoš, Jakub Stan k, Daniel Gromada, Josef Dvo ák Petr Habala Petr Habala (Gar.)	Z,ZK	4	2P+2C	L	Р
B3B31EPO	Electronic Devices and Circuits Ji í Hospodka, Ond ej Brunner, Tomáš Kouba, Jan Havlík Ji í Hospodka Ji í Hospodka (Gar.)	Z,ZK	6	4P+2L	Z	Р
B3B02FY1	Physics 1 Michal Bedna ík, Petr Koní ek Michal Bedna ík Michal Bedna ík (Gar.)	Z,ZK	6	4P+1L+2C	L	Р
B3B02FY2	Physics 2 Michal Bedna ík, Petr Koní ek, Vojt ch Jandák, Marek Brothánek Michal Bedna ík Michal Bedna ík (Gar.)	Z,ZK	6	3P+1L+2C	Z	Р
B3B01KAT	Complex Analysis and Transformations Martin Bohata	Z,ZK	7	4P+2S	z	Р
B3B38KDS	Communication and Distributed Systems Ji í Novák, Jan Holub Ji í Novák Ji í Novák (Gar.)	Z,ZK	6	4P+2L	Z	Р
B3B33KUI	Cybernetics and Artificial Intelligence Tomáš Svoboda, Petr Pošík Tomáš Svoboda Tomáš Svoboda (Gar.)	Z,ZK	6	2P+2C	L	Р
B0B01LAG	Linear Algebra Jakub Rondoš, Daniel Gromada, Josef Dvo ák, Ji í Velebil, Natalie Žukovec, Mat j Dostál Ji í Velebil Ji í Velebil (Gar.)	Z,ZK	8	4P+2S	Z	Р
B0B35LSP	Logic systems and processors Richard Šusta, Martin Hlinovský Martin Hlinovský Zden k Hurák (Gar.)	Z,ZK	6	2P+2L	L	Р
B0B01LGR	Logic and Graphs Natalie Žukovec, Mat j Dostál, Alena Gollová Alena Gollová Marie Demlová (Gar.)	Z,ZK	5	3P+2S	Z,L	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 Miroslav Korbelá, Petr Hájek, Martin Bohata, Jaroslav Tišer, Karel Pospíšil, Paola Vivi, Hana Tur inová Petr Hájek Jaroslav Tišer (Gar.)	Z,ZK	7	4P+2S	L,Z	Р
B0B33OPT	Optimization Tomáš Werner, Petr Olšák, Mirko Navara, Tomáš Kroupa Tomáš Werner Tomáš Werner (Gar.)	Z,ZK	7	4P+2C	Z,L	Р
B0B01PST	Probability and Statistics Kate ina Helisová Kate ina Helisová Petr Hájek (Gar.)	Z,ZK	7	4P+2S	Z	Р
B3B04PRE	Presentation Skills Petra Juna Jennings, Jitka Pinková Petra Juna Jennings (Gar.)	KZ	2	2C	L	Р
B3B36PRG	Programming in C Jan Faigl Jan Faigl (Gar.)	Z,ZK	6	2P+2C	L	Р
B3BPROJ4	Bachelor Project Petr Pošík, Jana Kostlivá, Martin Hlinovský, Jana Zichová, Drahomíra Hejtmanová, Martin Šipoš, Tomáš Drábek, Kamila Krupková Martin Hlinovský (Gar.)	Z	4	4s	Z	Р
B3B35RO	Robots	KZ	2	1P+2L	Z	Р
B3B33ROB	Robotics	Z,ZK	5	2P+2L	Z	Р
B3B38SME	Sensors and Measurements Vojt ch Petrucha, Pavel Ripka Vojt ch Petrucha Vojt ch Petrucha (Gar.)	Z,ZK	6	3P+2L	L	Р
B3B31SAS	Signals and Systems Radoslav Bortel, Pavel Sovka, Tomáš Bo il Pavel Sovka Pavel Sovka (Gar.)	Z,ZK	5	2P+2C	Z	Р

Characteristics of the courses of this group of Study Plan: Code=2015_BKYRP Name=Compulsory subjects of the programme

B3B04PSA	Academic Writing	KZ	2
Practically focused cour	se in which students learn how or improve their ability to correctly and effectively formulate common written documents such	as their own note	es, research,
reports protocols articl	es etc. Students will be acquainted with the main principles of writing professional texts		

Dabaavid			
B3B33ALP	Algorithms and Programming	Z,ZK	6
· -	idents a basic understanding of algorithms and programming and teach them to design, implement and test algorithms for si	•	
	f computational complexity. They will learn about basic program building blocks such as loops, conditional statements, variable to the conditional statements of the conditional statements of the conditional statements.	•	
	often used data structures (queue, stack, list, array etc) and operations on them. We will show the basic algorithms, for examination complements in Puthon	pie for searching a	na sorting.
	rite simple programs in Python.	7.71/	
B0B35APO	Computer Architectures	Z,ZK	5
B3B35ARI	Automatic Control	Z,ZK	7
	utomatic control. Introduction to basic concepts and properties of dynamic systems of physical, engineering, biological, econ-		
· · · · · · · · · · · · · · · · · · ·	of feedback and its use as a tool for altering the behavior of systems and managing uncertainty. Classical and modern meth ms. Students specialized in systems and control will build on these ideas and knowledge in the advanced courses to follow. S		_
-	its. Students specialized in systems and control will build on these ideas and knowledge in the advanced courses to follow. State control is an inspiring, ubiquitous and entertaining field worth of a future cooperation. Students? creativity is developed in		ranches and
B0B01DRN	Differencial Equations and Numerical Analysis	Z.ZK	4
	students to the classical theory of ordinary differential equations (separable and linear ODEs) and also to bsics of numerical n	, , ,	· ·
	ions of algebraic and differential equations and their systems). The course takes advantage of the synnergy between theore		
B3B31EPO	Electronic Devices and Circuits	Z,ZK	6
	students to the basic principles and methods of analysis of electrical circuits. Defines the circuit elements and gives their eler		_
	electronic systems based on analog as well as digital circuits. The course presents operational principles and methods of anal		
to the use of cybernetic		•	•
B3B02FY1	Physics 1	Z,ZK	6
	sics at the Faculty of Electrical Engineering - Physics 1, is devoted to the introduction into two important areas of physics. The		-
and the second one is th	ne electric and magnetic field. Within the framework of the classical mechanics, the students study the particle kinematics; dyn	amics of the mass	particle, system
of mass particles and ri	gid bodies. The students should be able to solve basic problems dealing with the description of mechanical systems, which the	hey can meet durir	ng their further
studies. The classical m	echanics is followed by the relativistic mechanics, electric and magnetic field - both stationary as well as non-stationary. The	students can use	the facts gained
	dy of electrical circuits, theory of electrotechnical materials or radioelectronics. Apart of this, the knowledge gained in this cou	ırse is required for	the study of the
consecutive course Phy			
B3B02FY2	Physics 2	Z,ZK	6
-	closely linked with the course Physics 1. Within the framework of this course the students will first of all learn foundations of		
<u>-</u>	vill give to the students basic insight into the properties of waves and will help to the students to understand that the present	=	
	oite of the waves character. Particular types of waves, such as acoustic or optical waves are the subjects of the following sec		
	plete the student?s general education in physics. The knowledge gained in this course will help to the students in study of si		as robotics,
·	ring technique and will allow them to understand the principles of novel technologies and functioning of new electronic devic		
B3B01KAT	Complex Analysis and Transformations	Z,ZK	7
B3B38KDS	Communication and Distributed Systems	Z,ZK	6
	on communication principles used within the distributed systems (DS). Initially the physical layer media are described, includir	-	
	nodulation techniques. Information theory is introduced together with coding methods for error detection, correction and/or info		-
· -	explained (addressing, media access control, flow control, ARQ methods). Finally the most widely used distributed system	ms technologies a	re presented
together with the family	of TCP/IP protocols and typical distributed systems applications.		
B3B33KUI	Cybernetics and Artificial Intelligence	Z,ZK	6
The course introduces t	he students into the field of artificial intelligence and gives the necessary basis for designing machine control algorithms. It a	idvances the know	ledge of state
The course introduces to space search algorithm	he students into the field of artificial intelligence and gives the necessary basis for designing machine control algorithms. It as by including uncertainty in state transition. Students are introduced into reinforcement learning for solving problems when t	dvances the know he state transitions	ledge of state s are unknown,
The course introduces t space search algorithm which also connects the	he students into the field of artificial intelligence and gives the necessary basis for designing machine control algorithms. It as by including uncertainty in state transition. Students are introduced into reinforcement learning for solving problems when the artificial intelligence and cybernetics fields. Bayesian decision task introduces supervised learning. Learning from data is de-	dvances the know he state transitions	ledge of state s are unknown,
The course introduces t space search algorithm which also connects the Students practice the al	he students into the field of artificial intelligence and gives the necessary basis for designing machine control algorithms. It as by including uncertainty in state transition. Students are introduced into reinforcement learning for solving problems when the artificial intelligence and cybernetics fields. Bayesian decision task introduces supervised learning. Learning from data is degoritms in computer labs.	ndvances the know he state transitions emonstrated on a li	ledge of state s are unknown, inear classifier.
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B3B35RO	Robots	KZ	2					
B3B33ROB	Robotics	Z,ZK	5					
The course is an intro	The course is an introduction into industrial robotics with the emphasis on the industrial robots and manipulators. The robot kinematics is thoroughly studied. The student shall be able							
to choose, design, an	d program industrial robot and integrate it into the robotic cell after passing the course.							
B3B38SME	Sensors and Measurements	Z,ZK	6					
B3B31SAS	Signals and Systems	Z,ZK	5					
The course focuses o	The course focuses on explaining basic terms used for the description and analysis of determined signals and systems (including filters) in continuous- and discrete-time. The graduate							
	he course focuses on explaining basic terms used for the description and analysis of determined signals and systems (including filters) in continuous- and discrete-time. The graduate ill acquire a basic overview of the issues and learn how to work with concepts, perform simple analysis of systems and signals, and interpret and discuss the results.							

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 Petra Juna Jennings, Markéta Havlí ková, Pavla Péterová, Erik Peter Stadnik, Michael Ynsua, Dana Saláková Petra Juna Jennings (Gar.)	KZ	0	0C	Z,L	Р
B0B04B2Z	English language B2 - exam Petra Juna Jennings, Markéta Havlí ková, Michael Ynsua, Dana Saláková Petra Juna Jennings, Petra Juna 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

		<u> </u>	
B0B04B1K	English language B1 - classified assessment	KZ	0
verifying of the student	s skills of B1 level		
B0B04B2Z	English language B2 - exam	Z,ZK	0

I) The B2 English Exam is a compulsory subject for all Faculty of Electrical Engineering students at the Czech Technical University. According to the Study and Examination Rules and Regulations for 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 elective courses

Minimal number of credits of the block: 20

The role of the block: PV

Code of the group: 2015 BKYRPV

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 24)

Requirement courses in the group: In this group you have to complete at least 4 courses (at most 6)

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
B3B14EPR	Electric Drives for Automation and Robotics Jan Bauer, Vít Hlinovský Vít Hlinovský	Z,ZK	4	2P+2L	L	PV
B3B35MSD	Modeling and Simulation of Dynamic Systems	Z,ZK	4	2P+2L	Z	PV
B3B38OTE	Circuit Technology Jan Holub Jan Holub (Gar.)	Z,ZK	4	2P+2L	L	PV
B3B35PAR	Programming of logic controllers and robots	Z,ZK	4	2P+2L	L	PV
B3B38VSY	Embedded Systems Vojt ch Petrucha, Jan Fischer Jan Fischer Jan Fischer (Gar.)	Z,ZK	4	2P+2L	Z	PV
B3B33VIR	Robot Learning	Z,ZK	4	2P+2L	Z	PV

Characteristics of the courses of this group of Study Plan: Code=2015_BKYRPV Name=Compulsory subjects of the programme

B3B14EPR	Electric Drives for Automation and Robotics	Z,ZK	4
The course gives a brief	overview of basic types of electric drives. It deals with drives with DC, asynchronous, synchronous and special motors including p	ower electronic co	nverters.Another
topics include control st	rategies such as scalar, vector, direct, sensorless control of AC drives, pulse width modulation strategies and various load type	oes. It is focused o	n understanding
the physical nature of a	given type of drive, general derivation of basic differential equations describing transient and steady states, and creating cor	rresponding mathe	matical models
of analyzed systems su	itable for both off-line simulation and online-adapted dynamic and real-time control using the basis of modern microprocessor	technology. Proble	ems of operating
states, sensors and dia	gnostics of electric drives are also discussed. Basic knowledge of mathematics, mechanics, kinematics, dynamics, theory of e	electromagnetic fie	ld, circuit theory
and control theory are	assumed.		
B3B35MSD	Modeling and Simulation of Dynamic Systems	Z,ZK	4
B3B38OTE	Circuit Technology	Z,ZK	4
Basic types of circuits a	nd blocks of digital measuring instruments are described and analysed. Range and linearity for analogue circuits and interfac	ces for digital circu	its are analysed
in detail.			
B3B35PAR	Programming of logic controllers and robots	Z,ZK	4
B3B38VSY	Embedded Systems	Z,ZK	4
This subject is focused	on the embedded system design, especially using ARM Cortex-M based microcontrollers. The students need to solve two si	mple and two com	plex projects of
embedded system desi	gn using microcontroller. These projects include both circuit and program realization.		
B3B33VIR	Robot Learning	Z,ZK	4
The course teaches ap	plication of machine learning methods and optimization on well-known robotic problems, such as semantic segmenation fron	n RGB-D data or r	eactive motion
control. The core of the	course represents teaching of deep learning methods. Stidents will use basic knowledge from optimization and linear algebra	a such as robut so	olving of
overdetermined system	is of (non)linear (non)homogenous equations or gradient minimization methods. The labs are divided into two parts, in the firs	st one, the students	s will solve basic
tasks in PyTorch, in the	second one, individual semestral work.		

Code of the group: 2015 BKYRLAB

Name of the group: Compulsory subjects of the programme

Requirement credits in the group: In this group you have to gain at least 4 credits (at most 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
B3B35LAR	Laboratory of applied electronics and control Martin Hlinovský Martin Hlinovský Martin Hlinovský (Gar.)	KZ	4	0P+4L	L	PV
B3B38LPE	Laboratories of Industrial Electronics and Sensors Tomáš Drábek, Vojt ch Petrucha, Jan Fischer, Michal Janošek Vojt ch Petrucha Vojt ch Petrucha (Gar.)	KZ	4	0P+4L	L	PV
B3B33LAR	Laboratory of robotics Vladimír Petrík, Pavel Krsek, Libor Wagner Pavel Krsek Pavel Krsek (Gar.)	KZ	4	0P+4L	L	PV

Characteristics of the courses of this group of Study Plan: Code=2015_BKYRLAB Name=Compulsory subjects of the programme

B3B35LAR	Laboratory of applied electronics and control	KZ	4		
B3B38LPE	Laboratories of Industrial Electronics and Sensors	KZ	4		
The objective of the "La	The objective of the "Laboratories" is to introduce students in a playful and interactive way with basic blocks of an industrial sensor system - from the sensor itself, through signal				
processing circuits, ana	processing circuits, analog to digital signal conversion, software processing by a microcontroller up to the sending of the results to the superior system or database and their presentation				
to the user within the co	oncept "Internet of Things".				
B3B33LAR	3B33LAR Laboratory of robotics KZ 4				
During this laboratory courses the students are introduced with the practical robotics through solving of practical tasks. Students are working in laboratories in groups which consist of					
3 or 4 members. During	the semester, each group of students jointly solve one practical problem in the field of robotics. Tasks are designed to introd	uce students with	robotics		

3 or 4 members. During the semester, each group of students jointly solve one practical problem in the field of robotics. Tasks are designed to introduce students with robotics (manipulators and mobile robots). The students should utilize the basic knowledge obtained in previous study (eg. mathematics, physics, electronics, software development). Students can select specific task from few tasks with different specialization, which are announced each semester. Tasks differs between semesters. An integral part of the solution of the problem is cooperation and communication in the student team.

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_BKYRH

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	V
B0B16FIL	Philosophy Peter Zamarovský Peter Zamarovský (Gar.)	ZK	2	2P+0S	Z,L	٧
B0B16FI1	Philosophy 1 Peter Zamarovský Peter Zamarovský (Gar.)	KZ	4	2P+2S	Z	V
B0B16HTE	History of technology and economic Marcela Efmertová, Jan Mikeš Marcela Efmertová Marcela Efmertová (Gar.)	ZK	2	2P+0S	Z,L	V
B0B16HT1	History of science and technology 1 Marcela Efmertová, Jan Mikeš Marcela Efmertová Marcela Efmertová (Gar.)	KZ	4	2P+2S	Z	V
B0B16HI1	History 1 Milena Josefovi ová Milena Josefovi ová Milena Josefovi ová (Gar.)	KZ	4	2P+2S	Z	V
B0B16MPS	Psychology Jan Fiala Jan Fiala (Gar.)	Z,ZK	4	2P+2S	Z,L	V
B0B16MPL	Psychology for managers Jan Fiala Jan Fiala (Gar.)	ZK	2	2P+0S	Z,L	V
A003TV	Physical Education Ji i Drnek	Z	2	0+2	L,Z	V

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

Characteristics of the courses of this group of study Plan: Code=2015_BKTKH 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	discussions in which students can react to lectures but also to actual questions coming with news and look for the communa	l answers.			
B0B16FIL	Philosophy	ZK	2		
We deal with the most in	nportant persons, schools and ideas of ancient philosophy. We are concerned especially on transdisciplinary nature of philos	sophy and connec	ction of old		
philosophical thoughts v	vith recent problems of science, technology, economics and politics.				
B0B16FI1	Philosophy 1	KZ	4		
We deal with the most in	nportant persons, schools and ideas of ancient philosophy. We are concerned especially on transdisciplinary nature of philos	sophy and connec	ction of old		
philosophical thoughts v	vith 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_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	٧
B0B04A22	English Language A2-2 Dana Saláková	Z	0	2s	L	V
B0B04B11	English Language B1-1 Petra Juna Jennings Petra Juna Jennings (Gar.)	Z	0	2C	Z	V
B0B04B12	English Language B1-2 Petra Juna Jennings Petra Juna Jennings (Gar.)	Z	0	2C	L	٧
B0B04B21	English Language B2-1 Petra Juna Jennings Petra Juna Jennings (Gar.)	Z	3	2C	Z	٧
B0B04B22	English Language B2-2 Petra Juna Jennings Petra Juna Jennings (Gar.)	Z	3	2C	Z,L	V

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

B0B04A21	English Language A2-1	Z				
The course is open to s	he course is open to students who are beginners in their second language. Course objective: Achieving competence in basic English.					
B0B04A22	B0B04A22 English Language A2-2 Z					
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	B0B04B11 English Language B1-1 Z 0					
Course objective: Broad	Course objective: Broadening the basic knowledge of general English; mastering basic specialised language; focusing on text analysis and vocabulary expansion; understanding spoken					
English.						

B0B04B12 English Language B1-2
Course objective: Broadening the basic knowledge of general English; mastering basic specialised language; focusing on text analysis and vocabulary expansion; understanding spoken English.

B0B04B21 English Language B2-1
This course is designed as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - zkouška - B0B04B2Z*). While

This course is designed as a full-year, two semester preparation course for the universitys 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.

This course is designed as a full-year, two semester preparation course for the universitys 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

B0B04B22

Name of the group: Physical education

English Language B2-2

Requirement credits in the group:

Requirement courses in the group: Credits in the group: 0

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
TVV	Physical education	Z	0	0+2	Z,L	V
A003TV	Physical Education Ji í Drnek	Z	2	0+2	L,Z	V
TV-V1	Physical education	Z	1	0+2	Z,L	V
TVV0	Physical education	Z	0	0+2	Z,L	V

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

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_BKYRVOL 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	l solutions of algebraic and differential equations and their systems). The course takes advantage of the synnergy between theoretic	al and practical poi	int of view.
B0B01LAG	Linear Algebra	Z,ZK	8
he course covers t	he initial parts of linear algebra. Firstly, the basic notions of a linear space and linear mappings are covered (linear dependence and inde	ependence, basis,	coordinates
etc). The calculus o	of matrices (determinants, inverse matrices, matrices of a linear map, eigenvalues and eigenvectors, diagonalisation, etc) is covered		ons include
5-5-4-05	solving systems of linear equations, the geometry of a 3D space (including the scalar product and the vector product) and S'		
B0B01LGR	Logic and Graphs	Z,ZK	5
his course covers i	basics of mathematical logic and graph theory. Syntax and semantics of propositional and predicate logic are introduced. The importance		onsequence
DODO4MA4	and of the relationship between a formula and its model is stressed. Further, basic notions from graph theory are introduced.		7
B0B01MA1	Mathematical Analysis 1 The aim of the course is to introduce students to basics of differential and integral calculus of functions of one variable.	Z,ZK	,
B0B01MA2	Mathematical Analysis 2	Z,ZK	7
	s an introduction to the differential and integral calculus in several variables and basic relations between curve and surface integrals.		
The Subject cover	series and power series with application to Taylor and Fourier series.	Otrici part contail	is ranotion
B0B01PST	Probability and Statistics	Z,ZK	7
B0B04A21	English Language A2-1	Z,ZR	'
שליטטטאענו	The course is open to students who are beginners in their second language. Course objective: Achieving competence in basic E	_	ļ
B0B04A22	English Language A2-2	Z	0
	en to students who are beginners in their second foreign language. The course objective is to develop and sustain their basic knowled		_
B0B04B11	English Language B1-1	7	0
	roadening the basic knowledge of general English; mastering basic specialised language; focusing on text analysis and vocabulary exp	_	
	English.	,	g -p
B0B04B12	English Language B1-2	Z	0
	roadening the basic knowledge of general English; mastering basic specialised language; focusing on text analysis and vocabulary exp		
•	English.		
B0B04B1K	English language B1 - classified assessment	KZ	0
	verifying of the student's skills of B1 level		
B0B04B21	English Language B2-1	Z	3
_	gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - Ised on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark)		
	ised on neiping students reach a level required to pass the Bz-level English Examination (or improve their English for a nigher mark) nical vocabulary and grammar expected of students at the university level. *NOTE:This exam is also used for determining an appropria		
academic and tecm	/ International Study.	ite level of English	ioi Liasiliu:
B0B04B22	English Language B2-2	Z	3
l l	gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 -	_	_
_	ised on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark)		-
	nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropria		
	/ International Study.		
B0B04B2Z	English language B2 - exam	Z,ZK	0
The B2 English E	xam is a compulsory subject for all Faculty of Electrical Engineering students at the Czech Technical University. According to the Students	dy and Examination	n Rules and
Regulations for Stu	dents at CTU (Part III, Article 4), a compulsory subject is one whose completion is a necessary condition in order to successfully com	plete the study pro	ogramme. Iı
· · · · · · · · · · · · · · · · · · ·	es 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 Euro	•	
	FR), an international standard for describing language ability, the definition of an English language learner who has achieved the B2		
	stand the main ideas of complex text on both concrete and abstract topics, including technical discussions in his/her field of specialisat Itaneity that makes regular interaction with native speakers quite possible without strain for either party. Can produce clear, detailed te		_
	rpoint on a topical issue giving the advantages and disadvantages of various options. III) Students who have successfully passed an	•	•
•	years may present their certificate to the Department of Languages, Faculty of Electrical Engineering. Upon approval, students are the		
	Test and the Oral Part. For a list of approved international exams go the department website: http://jazyky.fel.cvut.cz/		
B0B16ET1	Ethic 1	KZ	4
	s to provide the students an orientation not only in general problems of ethics but above all to offer instructions for solving various situ		
	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
	e most important persons, schools and ideas of ancient philosophy. We are concerned especially on transdisciplinary nature of philos		l
	philosophical thoughts with recent problems of science, technology, economics and politics.		
B0B16FIL	Philosophy	ZK	2
We deal with the	e most important persons, schools and ideas of ancient philosophy. We are concerned especially on transdisciplinary nature of philos		on 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	Psychology for managers	ZK	2
B0B16MPS	Psychology	Z,ZK	4
ס אוטו מטם	і әуыннуу	<u>۷,۷۲</u>	

	Optimization	Z,ZK	7
B0B33OPT The course provide	es an introduction to mathematical optimization, specifically to optimization in real vector spaces of finite dimension. The theory is illustrated		1
•	You will refresh and extend many topics that you know from linear algebra and calculus courses.		·
B0B35APO	Computer Architectures	Z,ZK	5
B0B35LSP	Logic systems and processors	Z,ZK	6
	ces computing resources' basic hardware structures, design, and architecture. It provides an overview of the possibilities of performing data	•	
-	ng embedded processor systems with peripherals on modern FPGA programmable logic circuits, which are increasingly widely used too	-	
-	IDL, from logic to more complex sequential circuits to practical finite state machine (FSM) designs. They will also master the correct des al problems are solved using development boards that hundreds of leading universities worldwide also use. The course ends with RISC-\		-
imalation. Fraction	and pipeline processing. [last updated January 2024]	processor stru	otaro, caoric
B3B01KAT	Complex Analysis and Transformations	Z,ZK	7
B3B02FY1	Physics 1	Z,ZK	6
	of physics at the Faculty of Electrical Engineering - Physics 1, is devoted to the introduction into two important areas of physics. The first	,	1
nd the second on	e is the electric and magnetic field. Within the framework of the classical mechanics, the students study the particle kinematics; dynamics	of the mass pa	rticle, syster
tudies. The classic	and rigid bodies. The students should be able to solve basic problems dealing with the description of mechanical systems, which they cal mechanics is followed by the relativistic mechanics, electric and magnetic field - both stationary as well as non-stationary. The stude e study of electrical circuits, theory of electrotechnical materials or radioelectronics. Apart of this, the knowledge gained in this course is consecutive course Physics 2.	ents can use the	facts gaine
B3B02FY2	Physics 2	Z,ZK	6
	cs 2 is closely linked with the course Physics 1. Within the framework of this course the students will first of all learn foundations of therr		-
the theory of wav	ves - will give to the students basic insight into the properties of waves and will help to the students to understand that the presented de	scription of the	waves has
	ter in spite of the waves character. Particular types of waves, such as acoustic or optical waves are the subjects of the following section		
	will complete the student?s general education in physics. The knowledge gained in this course will help to the students in study of such		as robotics,
	mputer vision, measuring technique and will allow them to understand the principles of novel technologies and functioning of new electr		
B3B04PRE	Presentation Skills	KZ	2
B3B04PSA	Academic Writing	KZ	2
Practically focuse	ed course in which students learn how or improve their ability to correctly and effectively formulate common written documents such as reports, protocols, articles, etc. Students will be acquainted with the main principles of writing professional texts.	their own notes	s, researcn,
B3B14EPR	Electric Drives for Automation and Robotics	Z,ZK	4
	brief overview of basic types of electric drives. It deals with drives with DC, asynchronous, synchronous and special motors including power	,	1
-	rol strategies such as scalar, vector, direct, sensorless control of AC drives, pulse width modulation strategies and various load types. It		
•	e of a given type of drive, general derivation of basic differential equations describing transient and steady states, and creating correspond		
	e of a given type of drive, general derivation of basic differential equations describing transfer and steady states, and creating corresponses suitable for both off-line simulation and online-adapted dynamic and real-time control using the basis of modern microprocessor technologies.	-	
	d diagnostics of electric drives are also discussed. Basic knowledge of mathematics, mechanics, kinematics, dynamics, theory of electric		-
			on our triooi
iales, serisors arr		illagrietic lielu,	
	and control theory are assumed.		6
B3B31EPO		Z,ZK	6 It deals with
B3B31EPO The course introd	and control theory are assumed. Electronic Devices and Circuits	Z,ZK ary application.	It deals with
B3B31EPO The course introd	and control theory are assumed. Electronic Devices and Circuits uces students to the basic principles and methods of analysis of electrical circuits. Defines the circuit elements and gives their elements	Z,ZK ary application.	It deals with
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B3B35PAR	Programming of logic controllers and robots	Z,ZK	4
B3B35RO	Robots	KZ	2
B3B36PRG	Programming in C	Z,ZK	6
_	to gain a deep, comprehensive knowledge of the C programming language in terms of program operation, access and memory managements of the C programming language in terms of program operation, access and memory managements of the C programming language in terms of program operation, access and memory managements of the C programming language in terms of program operation, access and memory managements of the C programming language in terms of program operation, access and memory managements of the C programming language in terms of program operation, access and memory managements of the C programming language in terms of program operation, access and memory managements of the C programming language in terms of program operation, access and memory managements of the C programming language in terms of the C programming language in the C programming language in terms of the C programming language in terms of the C programming language in terms	-	
	applications. The course emphasizes acquiring programming habits for creating readable and reusable programs. Students get acquire		
	nd their debugging. Lectures are based on the presentation of basic software constructs and demonstration of motivational programs w	•	
=	and structure of source code, real computational complexity, and related tools for profiling and debugging. Students get acquainted		-
programming of mu	ulti-threaded applications, synchronization mechanisms, and models of multi-threaded applications. At the end of the semester, the basic	teatures of the ob	ject-oriented
	C ++ extension are briefly presented.		
B3B38KDS	Communication and Distributed Systems	Z,ZK	6
•	sed on communication principles used within the distributed systems (DS). Initially the physical layer media are described, including c		
	ital modulation techniques. Information theory is introduced together with coding methods for error detection, correction and/or inform	•	•
iink-iayer aigoritni	ms are explained (addressing, media access control, flow control, ARQ methods). Finally the most widely used distributed systems	s technologies are	presented
Danagi DE	together with the family of TCP/IP protocols and typical distributed systems applications.	KZ	1 4
B3B38LPE	Laboratories of Industrial Electronics and Sensors the "Laboratories" is to introduce students in a playful and interactive way with basic blocks of an industrial sensor system - from the		4
-	analog to digital signal conversion, software processing by a microcontroller up to the sending of the results to the superior system or d		
processing circuits,	to the user within the concept "Internet of Things".	atabase and their	presentation
B3B38OTE	Circuit Technology	Z,ZK	4
	Circuit Technology uits and blocks of digital measuring instruments are described and analysed. Range and linearity for analogue circuits and interfaces		1
basic types of circl	in detail.	ioi digital circuits	are arranysed
B3B38SME	Sensors and Measurements	Z,ZK	6
B3B38VSY	Embedded Systems	Z,ZK	4
	used on the embedded system design, especially using ARM Cortex-M based microcontrollers. The students need to solve two simples	'	1
Tillo oubject lo loce	embedded system design using microcontroller. These projects include both circuit and program realization.	o ana two comple	x projecto of
B3BPROJ4	Bachelor Project	Z	4
BBAP16	Bachelor Thesis	Z	16
BEZB	Safety in Electrical Engineering for a Bachelor's Degree	Z	0
	safety course is to give the students basic knowledge of electrical equipment and installation as to avoid danger arising from operation	_	
	amentals of Safety Electrical Engineering. In this way the students receive qualification of instructed person that enables them to worl		
BEZZ	Basic Health and Occupational Safety Regulations	7	0
The guidelines wer	e worked out based on The Training Scheme for Health and Occupational Safety designed for employees and students of the Czech	ı Technical Universi	ty in Prague
	d by the Rector's Office of the CTU. Safety is considered one of the basic duties of all employees and students. The knowledge of He		
•	regulations forms an integral and permanent part of qualification requirements. This program is obligatory.	·	•
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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