Studijní plán

Název plánu: Electrical Engineering and Computer Science (EECS)

Sou ást VUT (fakulta/ústav/další): Fakulta elektrotechnická Katedra: Obor studia, garantovaný katedrou: P ed za azením do oboru Garant oboru studia.: Program studia: Electrical Engineering and Computer Science Typ studia: Bakalá ské prezen ní P edepsané kredity: 160 Kredity z volitelných p edm t : 20 Kredity v rámci plánu celkem: 180 Poznámka k plánu:

Název bloku: Povinné p edm ty programu Minimální po et kredit bloku: 122 Role bloku: P

Kód skupiny: 2018_BEECSBAP Název skupiny: Bachelor Thesis Podmínka kredity skupiny: V této skupin musíte získat 20 kredit Podmínka p edm ty skupiny: V této skupin musíte absolvovat alespo 1 p edm t Kredity skupiny: 20

Poznámka ke skupině:

	Název p edm tu / Název skupiny p edm t (u skupiny p edm t seznam kód jejích len) Vyu ující, auto i a garanti (gar.)	Zakon ení	Kredity	Rozsah	Semestr	Role
BEBAP20	Bachelor thesis	Z	20	12S	L,Z	Р

Ζ

20

Charakteristiky p edmet této skupiny studijního plánu: Kód=2018 BEECSBAP Název=Bachelor Thesis BEBAP20 Bachelor thesis

Kód skupiny: 2018_BEECSP

Název skupiny: Compulsory subjetcs of the programme

Podmínka kredity skupiny: V této skupin musíte získat 102 kredit

Podmínka p edm ty skupiny: V této skupin musíte absolvovat alespo 18 p edm t Kredity skupiny: 102

Poznámka ke skupině:

Kód	Název p edm tu / Název skupiny p edm t (u skupiny p edm t seznam kód jejích len) Vyu ující, auto i a garanti (gar.)	Zakon ení	Kredity	Rozsah	Semestr	Role
BEEZZ	Basic health and occupational safety regulations Radek Havlí ek, Vladimír K la, Ivana Nová Radek Havlí ek Vladimír K la (Gar.)	Z	0	2BP+2BC	Z	Ρ
BE5B16EPD	Business Economics Tomáš Podivínský Tomáš Podivínský Tomáš Podivínský (Gar.)	KZ	4	2P+2S	Z,L	Ρ
BE5B01MA1	Calculus 1 Paola Vivi Paola Vivi Paola Vivi (Gar.)	Z,ZK	7	4P+2S	Z	Р
BE5B01MA2	Calculus 2 Paola Vivi Paola Vivi Petr Habala (Gar.)	Z,ZK	7	4P+2S	L	Ρ
BE5B01DEN	Differential Equations&Numerical Methods Petr Habala Petr Habala Petr Habala (Gar.)	Z,ZK	7	4P+2C	L	Р
BE5B01DMG	Discrete Mathematics and Graphs Jan Hamhalter Jan Hamhalter Jan Hamhalter (Gar.)	Z,ZK	5	3P+1S	Z	Ρ
BE5B34ELP	Electron Devices Alexandr Laposa, Adam Bou a Adam Bou a Pavel Hazdra (Gar.)	Z,ZK	5	2P+2L	L	Ρ
BE5B31ZEO	Fundamentals of Electrical Circuits Pavel Máša Pavel Máša Ji í Hospodka (Gar.)	Z,ZK	5	2P+2S	Z	Р
BE5B01LAL	Linear Algebra Paola Vivi Paola Vivi Paola Vivi (Gar.)	Z,ZK	8	4P+2S	Z	Ρ

BE5B15MAA	Mathematical Applications Stanislav Vítek, Jan Kyncl, Václav Vencovský Jan Kyncl Jan Kyncl (Gar.)	Z,ZK	4	0P+4C	L	Р						
BE5B34MIK	Microcontrollers Tomáš Teplý, Vladimír Janí ek Tomáš Teplý Vladimír Janí ek (Gar.)	Z,ZK	6	2P+2L	L	Р						
BE5B02PH1	Physics 1 Stanislav Pekárek, Jaroslav Jíra Stanislav Pekárek Stanislav Pekárek (Gar.)	Z,ZK	8	4P+1L+2C	L	Р						
BE5B02PH2	Physics 2 Stanislav Pekárek, Jaroslav Jíra Stanislav Pekárek Stanislav Pekárek (Gar.)	Z,ZK	7	3P+1L+2C	Z	Р						
BE5B01PRS	Probability and Statistics Kate ina Helisová, Bogdan Radovi Kate ina Helisová Kate ina Helisová (Gar.)	Z,ZK	7	4P+2S	Z	Р						
BE5B33PRG	Programming Essentials Pavel Šindler, Petr Pošík, Milan N mý Tomáš Svoboda Tomáš Svoboda (Gar.)	Z,ZK	6	2P+2C	Z	Р						
BE5B33PGE	Programming for Engineers Radoslav Škoviera Petr Pošík Petr Pošík (Gar.)	Z,ZK	6	2P+2C	L	Р						
BE5B99PRO	Project Jaroslav Knápek, Jan Jandera Jan Jandera Jaroslav Knápek (Gar.)	Z	10	2P+2S+6D	Z	Р						
BEEZB	Safety in Electrical Engineering for a bachelor's degree Radek Havlí ek, Vladimír K la, Ivana Nová Radek Havlí ek Vladimír K la (Gar.)	Z	0	2BP+2BC	Z,L	Р						
Charakteristiky p edn	net této skupiny studijního plánu: Kód=2018_BEECSP Název=	Compulsory	v subjeto	s of the p	orogramm	e						
	sic health and occupational safety regulations				Z	0						
	povinné pé e fakulty o bezpe nost a ochranu zdraví p i práci na VUT v Praze. Stude	nti všech progran	n bakalá s	ského studia t	ímto absolvu	jí povinné						
základní školení BOZP. Škole	ení je povinné dle platné sm rnice d kana.											
BE5B16EPD Bu	siness Economics			ł	<z< td=""><td>4</td></z<>	4						
Targets and function of busin	ness, corporation life cycle. Cost classification, cost calculation, cost curves. Profit, proc	luction, price and	cost relation	on. Taxes. Fin	ancial calcul	us and						
	Business plan. Management functions, corporation organizational schemes. Processe hketa/aktualni/courses/AE0B16EPD	s and firm manag	gement. Výs	sledek studer	ntské ankety	p edm tu je						
	lculus 1			7	.ZK	7						
	o calculus of functions of one variable. It starts with limit and continuity of functions, der	ivative and its ge	ometrical n		′ I	aphing of						
	finite integral, basic integration methods and integrating rational functions, definite inte	•		• •								
series.												
BE5B01MA2 Ca	Iculus 2			Z	,ZK	7						
The subject covers an introdu	uction to the differential and integral calculus in several variables and basic relations betw	veen curve and s	urface integ	rals. Fourier	series are als	o introduced.						
Výsledek studentské ankety	p edm tu je zde: http://www.fel.cvut.cz/anketa/aktualni/courses/AE3B01MA2											
BE5B01DEN Dif	ferential Equations&Numerical Methods			Z	,ZK	7						
	denty s klasickou teorií oby ejných diferenciálních rovnic (separabilní a lineární ODR) a		•	•								
	é ešení rovnic algebraických a diferenciálních a jejich soustav). Kurs siln využívá syne	rgie mezi pohled	em teoretic	kým a praktic	kým. Výslede	ek studentské						
ankety p edm tu je zde: https://fel.cvut.cz/cz/anketa/aktualni/courses/BE5B01DEN/												
						5						
BE5B01DMG Dis	crete Mathematics and Graphs	· · ·			,ZK	The aim of the course is to introduce students to fundamentals of Discrete Mathematics with focus on electrical engineering. The content of the course covers fundamentals of						
BE5B01DMG Dis The aim of the course is to in	troduce students to fundamentals of Discrete Mathematics with focus on electrical eng	-		course cove	rs fundament							
BE5B01DMG Dis The aim of the course is to ir propositional and predicate I	ntroduce students to fundamentals of Discrete Mathematics with focus on electrical encougic, infinite sets with focus on the notion of cardinality of sets, binary relations with focus	-		course cove	rs fundament							
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BE5B02PH2	Physics 2	Z,ZK	7
Within the framework o	this course the students will first of all learn foundations of thermodynamics. Following topic - the theory of waves - will give	to the students ba	isic insight into
the properties of waves	and will help to the students to understand that the presented description of the waves has a universal character in spite of t	he waves charact	er. Particular
types of waves, such as	s acoustic or optical waves are the subjects of the following section. Quantum mechanics and nuclear physics will complete th	ne student's gene	ral 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 the	m to understand
the principles of novel t	echnologies and functioning of new electronic devices.		
BE5B01PRS	Probability and Statistics	Z,ZK	7
Cílem p edm tu je sezr	ámit studenty se základy teorie pravd podobnosti a matematické statistiky, jejich výpo etními metodami a aplikacemi t chto ma	atematických nást	roj na praktické
p íklady.			
BE5B33PRG	Programming Essentials	Z,ZK	6
The course focuses on	understanding and mastering basic design principles of algorithms. It develops data abstraction coupled with the essential pro-	gramming pattern	s. The emphasis
is on creating readable	and reusable programs.		
BE5B33PGE	Programming for Engineers	Z,ZK	6
BE5B99PRO	Project	Z	10
BEEZB	Safety in Electrical Engineering for a bachelor's degree	Z	0
Školení seznamuje stu	denty všech program 🛛 s riziky a p í inami úraz elektrickým proudem, s bezpe nostními p edpisy pro obsluhu a práci na elek	trických za ízeníc	h, s ochranami
p ed úrazem elektrický	n proudem, s první pomocí p i úrazu elektrickým proudem a dalšími bezpe nostními technickými opat eními v elektrotechnic	e. Studenti získají	pot ebnou
elektrotechnickou kvalil	ikaci pro innost na VUT FEL.		

Název bloku: Povinn volitelné p edm ty Minimální po et kredit bloku: 38 Role bloku: PV

Kód skupiny: 2018_BEECSPV Název skupiny: Compulsory subjetcs of the branch Podmínka kredity skupiny: V této skupin musíte získat alespo 38 kredit (maximáln 87) Podmínka p edm ty skupiny: V této skupin musíte absolvovat alespo 7 p edm t Kredity skupiny: 38

Poznámka ke skupině:

Kód	Název p edm tu / Název skupiny p edm t (u skupiny p edm t seznam kód jejích len) Vyu ující, auto i a garanti (gar.)	Zakon ení	Kredity	Rozsah	Semestr	Role
BE5B33ALG	Algorithms Marko Genyk-Berezovskyj, Daniel Pr ša Daniel Pr ša Marko Genyk-Berezovskyj (Gar.)	Z,ZK	6	2P+2C	z	PV
BE5B35ARI	Automatic Control Petr Hušek Martin Hrom ík (Gar.)	Z,ZK	7	4P+2L	L	PV
BE5B99CPL	C Programming Language Tomáš Krajník, Yuliia Prokop Jan Faigl Jan Faigl (Gar.)	Z,ZK	6	2P+2C+5D	Z	PV
BE5B32PKS	Computer and Communication Networks Pavel Bezpalec Pavel Rezpalec	Z,ZK	6	2P + 2C	Z	PV
BE5B35APO	Computer Architectures Pavel Píša, Richard Šusta Pavel Píša Pavel Píša (Gar.)	Z,ZK	6	2P+2L	L	PV
BE5B33KUI	Cybernetics and Artificial Intelligence Petr Pošík, Tomáš Svoboda Tomáš Svoboda Tomáš Svoboda (Gar.)	Z,ZK	6	2P+2C	L	PV
BE5B14SP1	Electric Machinery and Apparatus 1 Pavel Mindl, Miroslav Chomát Pavel Mindl Pavel Mindl (Gar.)	Z,ZK	5	3P+2L	L	PV
BE5B17EMT	Electromagnetic Field Theory Jan Machá , Zbyn k Škvor Zbyn k Škvor (Gar.)	Z,ZK	6	3P+2C	Z	PV
BE5B35LSP	Logic Systems and Processors Richard Šusta, Martin Hlinovský Martin Hlinovský Richard Šusta (Gar.)	Z,ZK	6	3P+2L	Z	PV
BE5B13MVE	Materials for Power Electrical Engineering Jan Zemen, Pavel Ctibor, Pavel Mach, Josef Sedlá ek, Karel Dušek, Neda Neykova Pavel Mach Pavel Mach (Gar.)	Z,ZK	5	2P+2L	z	PV
BE5B33RPZ	Pattern Recognition and Machine Learning Ond ej Drbohlav, Ji í Matas, Jan Šochman Jan Šochman Ji í Matas (Gar.)	Z,ZK	6	2P+2C	Z	PV
BE5B15EN1	Power Engineering 1 Ivo Doležel, Zden k Müller Zden k Müller (Gar.)	Z,ZK	5	2P+2C	L	PV
BE5B15EN2	Power Engineering 2 Ivo Doležel, Zden k Müller	Z,ZK	6	2P+2L	Z	PV
BE5B38SME	Sensors and Measurement Pavel Ripka, Mattia Butta Mattia Butta Pavel Ripka (Gar.)	Z,ZK	6	4P+2L	Z	PV
BE5B31TES	Signal Theory Radoslav Bortel Radoslav Bortel (Gar.)	Z,ZK	5	2P+2C	L	PV

Charakteristiky p edmet této skupiny studijního plánu: Kód=2018_BEECSPV Název=Compulsory subjetcs of the branch

BE5B33ALG Algorithms Z,ZK 6 In the course, the algorithms development is constructed with minimum dependency to programming language; nevertheless the lectures and seminars are based on Python. Basic data types a data structures, basic algorithms, recursive functions, abstract data types, stack, queues, trees, searching, sorting, special application algorithms. Students are able to design and construct non-trivial algorithms and to evaluate their affectivity. Výsledek studentské ankety p edm tu je zde: http://www.fel.cvut.cz/anketa/aktualni/courses/AE4B33ALG

	,	
BE5B35ARI Automatic Control	Z,ZK	7
Foundation course of automatic control. Introduction to basic concepts and properties of dynamic systems of physical, engineering, biological, econ	omics, robotics an	d informatics
nature. Basic principles of feedback and its use as a tool for altering the behavior of systems and managing uncertainty. Classical and modern meth		e e
automatic control systems. Students specialized in systems and control will build on these ideas and knowledge in the advanced courses to follow.	Students of other b	ranches and
programs will find out that control is a inspiring, ubiquitous and entertaining field worth of a future cooperation. Výsledek studentské ankety p edm t	u je zde:	
http://www.fel.cvut.cz/anketa/aktualni/courses/AE3B35ARI		
BE5B99CPL C Programming Language	Z,ZK	6
The course provides complete knowledge of the C programming language regarding a program structure operation, memory access, and multi-thread	applications. The c	ourse emphasis
a ?good? programming style to develop clean, easy-to-read, and re-usable code. Students are introduced into the process of the source code comp		00 0
Lectures introduce basic code structures and demonstration applications which link together partial constructs and practical coding aiming for clean		
code, computational efficiency optimized using code profiling and debugging. Students are introduced into the fundamental principles of parallel multi-thu		synchronization
mechanism and multi-thread application models. The end of the course presents introduction to principles of object oriented programming and C++.	,,	
BE5B32PKS Computer and Communication Networks	Z,ZK	6
The aim of the course is to familiarize students with current trends in the switched local networks and the key functions of routing protocols in IP net	works. The course	is aimed rather
primarily practically then theoretically		
BE5B35APO Computer Architectures	Z,ZK	6
Subject provides overview of basic building blocks of computer systems. Explanation starts from hardware side where it extends knowledge present	ted in the previous	lectures of
Structures of computer systems. Topics cover building blocks description, CPU structure, multiple processors interconnections, input/output subsyst	em and basic over	view of network
and buses topologies. Emphasis is placed on clarification of interconnection of hardware components with software support, mainly lower levels of c	operating systems,	device drivers
and virtualization techniques. General principles are more elaborated during presentation of examples of multiple standard CPU architectures. Exer	cises are more foc	used on the
software view to the contrary. Students are lead from basic programming on CPU level to the interaction with raw hardware. Výsledek studentské an	kety p edm tu je z	:de:
http://www.fel.cvut.cz/anketa/aktualni/courses/AE0B36APO		
BE5B33KUI Cybernetics and Artificial Intelligence	Z,ZK	6
The course introduces the students into the field of artificial intelligence and gives the necessary basis for designing machine control algorithms. It a	dvances the know	ledge of state
space search algorithms by including uncertainty in state transition. Students are introduced into reinforcement learning for solving problems when I	the state transition	s are unknown,
which also connects the artificial intelligence and cybernetics fields. Bayesian decision task introduces supervised learning. Learning from data is de	emonstrated on a	inear classifier.
Students practice the algoritms in computer labs.		
BE5B14SP1 Electric Machinery and Apparatus 1	Z,ZK	5
Electric drive and its components. Electromechanical energy conversion. Rotational converters - DC machines, induction motors, synchronous gene	rators and motors	Special electric
machines, actuators. Static converters - transformers. There are presented operational principles, main constructional scheme and characteristics, a	applications. Switc	ning theory.
Interaction between turn-off switch and switched circuit. Basic theory and characteristic of electric arc. Transient recovery voltage. Switching overvol	tage. Low voltage	protection
apparatuses.	0	
BE5B17EMT Electromagnetic Field Theory	Z,ZK	6
This course presents fundamentals of electromagnetic field theory and its applications. Analysis methods proper for static, stationary as well as dyna	1 · · ·	-
and on basic transmission lines are presented as well. This course provides students with physics - based wiev on studied effects, which is applied it		
the end of the course, all effects should not only be described, but quantified as well. Basic knowledge and insight into communication devices, syst	•	
applicable not only to systems currently taught in other courses, but to future systems as well.		
BE5B35LSP Logic Systems and Processors	Z.ZK	6
P edm t uvádí do oblasti základních hardwarových struktur výpo etních prost edk , jejich návrhu a architektury. Podává p ehled o možnostech prov	, ,	-
hardwaru a o tvorb vestav ných procesorových systém s perifériemi na moderních programovatelných logických obvodech FPGA, které se dnes	•	
se nau í, jak lze popsat obvody v jazyce VHDL po ínaje logikou p es složit jší sekven ní obvody až k praktickým návrh m kone ných automat (FS		
návrhu pomocí simulace obvod. Ve cvi ení se eší praktické úlohy s využitím vývojových desek používaných na stovkách p edních univerzit po cel		
procesoru RISC-V, prací s pam ti cache a proudovým zpracováním instrukcí.	· · · ·	
BE5B13MVE Materials for Power Electrical Engineering	Z,ZK	5
At first a physical description of basic properties and basic types of materials for electrical engineering is carried out. Types of conductors, supercon	1 1	
materials and semiconductors, which are used in power electrical engineering, are presented. The stress is put on relationships between properties		-
student will meet, in higher detail, with ceramics for electrical engineering, with properties of mica, glass and their applications, with environmental of		
for thin and thick films and with selected nanomaterials and their applications. Výsledek studentské ankety p edm tu je zde: http://www.fel.cvut.cz/ank		
BE5B33RPZ Pattern Recognition and Machine Learning	Z,ZK	6
	1 ' 1	-
The basic formulations of the statistical decision problem are presented. The necessary knowledge about the (statistical) relationship between obse		-
acquired by learning on the raining set. The course covers both well-established and advanced classifier learning methods, as Perceptron, AdaBoos		
Neural Nets. This course is also part of the inter-university programme prg.ai Minor. It pools the best of AI education in Prague to provide students w	nin a deeper and i	noader insigni
into the field of artificial intelligence. More information is available at https://prg.ai/minor.	774	
BE5B15EN1 Power Engineering 1	Z,ZK	5
The course informs students about basic principles and topologies of electrical transmission and distribution systems. There are explained key syste	em elements and t	heir parameters,
steady, transient and failure phenomena, main rules for dimensioning and protecting.	7 74	
BE5B15EN2 Power Engineering 2	Z,ZK	6
This course is an introduction to the field of thermodynamic processes in thermal power plants, energy balances and structure of various renewable a		
technologies. Students will became also familiar with individual components of self consumption of power plants. The power generation and distribution of the second		
systems and insulation materials. The fundamental theory of often used insulation materials and their propertis will be explained. Lightning and switc	ning overvoltages	and their impact
to the insulation of electric power system will be discussed at the end of the course.	<u> </u>	
BE5B38SME Sensors and Measurement	Z,ZK	6
Basic circuits and instruments for measurement of electrical quantities, AD and DA converters, sensors focused to use in robotics and automation, i	intelligent sensors,	methods of
decreasing uncertainties. Výsledek studentské ankety p edm tu je zde: http://www.fel.cvut.cz/anketa/aktualni/courses/AE3B38SME	· · - ·	
BE5B31TES Signal Theory	Z,ZK	5
Název bloku: Volitelné p edm ty		

Minimální po et kredit bloku: 0 Role bloku: V

Kód skupiny: 2018_BEECSVOL

Název skupiny: Elective special subjects Podmínka kredity skupiny: Podmínka p edm ty skupiny: Kredity skupiny: 0

Poznámka ke skupině: ~Student can choose arbitrary subject of the bachelor's program (EEM - Electrical Engineering, Power Engineering and Management, KME - Communications, Multimedia and Electronics, KYR - Cybernetics and Robotics, OI - Open Informatics, OES - Open Electronics Systems) which is not part of his curriculum. Student can choose with consideration of recommendation of the branch guarantee.\\

Seznam p edm t tohoto pr chodu:

Kód	Název p edm tu	Zakon ení	Kredity		
BE5B01DEN	Differential Equations&Numerical Methods	Z,ZK	7		
Cílem kursu je sez	námit studenty s klasickou teorií oby ejných diferenciálních rovnic (separabilní a lineární ODR) a zárove je uvést do problematiky r	umerické matema	tiky (chyby		
výpo tu a stabilita, numerické ešení rovnic algebraických a diferenciálních a jejich soustav). Kurs siln využívá synergie mezi pohledem teoretickým a praktickým. Výsledek studentské					
	ankety p edm tu je zde: https://fel.cvut.cz/cz/anketa/aktualni/courses/BE5B01DEN/				
BE5B01DMG	Discrete Mathematics and Graphs	Z,ZK	5		
	course is to introduce students to fundamentals of Discrete Mathematics with focus on electrical engineering. The content of the cour	se covers fundame	entals of		
propositional and p	redicate logic, infinite sets with focus on the notion of cardinality of sets, binary relations with focus on equivalences and partial orderi algebraic structures including Boolean algebras. Further, the course covers basics of the Theory of Graphs.	ngs; integers, relat	ion modulo;		
BE5B01LAL	Linear Algebra	Z,ZK	8		
The course cove	rs standard basics of matrix calculus (determinants, inverse matrix) and linear algebra (basis, dimension, inner product spaces, linea	r transformations)	including		
	eigenvalues and eigenvectors. Matrix similarity, orthogonal bases, and bilinear and quadratic forms are also covered.				
BE5B01MA1	Calculus 1	Z,ZK	7		
	y course to calculus of functions of one variable. It starts with limit and continuity of functions, derivative and its geometrical meaning	g and properties, g	raphing of		
functions. Then it	covers indefinite integral, basic integration methods and integrating rational functions, definite integral and its applications. It conclud	es with introduction	n to Taylor		
	series.				
BE5B01MA2	Calculus 2	Z,ZK	7		
	an introduction to the differential and integral calculus in several variables and basic relations between curve and surface integrals. Fou		introduced.		
	Výsledek studentské ankety p edm tu je zde: http://www.fel.cvut.cz/anketa/aktualni/courses/AE3B01MA2				
BE5B01PRS	Probability and Statistics	Z,ZK	7		
	eznámit studenty se základy teorie pravd podobnosti a matematické statistiky, jejich výpo etními metodami a aplikacemi t chto mater		na praktické		
	p íklady.				
BE5B02PH1	Physics 1	Z,ZK	8		
	physics at the Faculty of Electrical Engineering - Physics 1, is devoted to the introduction into two important areas of physics. The first	· · ·	I mechanics		
	is the electric and magnetic field. Within the framework of the classical mechanics, the students study the particle kinematics; dynamic				
of mass particles a	nd rigid bodies. The students should be able to solve basic problems dealing with the description of mechanical systems, which they	can meet during t	heir further		
studies. The classic	al mechanics is followed by the relativistic mechanics, electric and magnetic field - both stationary as well as non-stationary. The stuc	dents can use the f	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.				
BE5B02PH2	Physics 2	Z,ZK	7		
Within the framewo	ork of this course the students will first of all learn foundations of thermodynamics. 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 presented description of the waves has a universal character in spite of the	e waves character.	Particular		
types of waves, su	ch as acoustic or optical waves are the subjects of the following section. Quantum mechanics and nuclear physics will complete the s	student's general e	ducation in		
physics. The knowle	dge gained in this course will help to the students in study of such modern areas as robotics, computer vision, measuring technique an	d will allow them to	understand		
	the principles of novel technologies and functioning of new electronic devices.				
BE5B13MVE	Materials for Power Electrical Engineering	Z,ZK	5		
	description of basic properties and basic types of materials for electrical engineering is carried out. Types of conductors, supercond		-		
	niconductors, which are used in power electrical engineering, are presented. The stress is put on relationships between properties, t				
	n higher detail, with ceramics for electrical engineering, with properties of mica, glass and their applications, with environmental con	, ,			
	ns and with selected nanomaterials and their applications. Výsledek studentské ankety p edm tu je zde: http://www.fel.cvut.cz/anketa/				
BE5B14SP1	Electric Machinery and Apparatus 1	Z,ZK	5		
	s components. Electromechanical energy conversion. Rotational converters - DC machines, induction motors, synchronous generato				
	ors. Static converters - transformers. There are presented operational principles, main constructional scheme and characteristics, ap				
Interaction betw	een turn-off switch and switched circuit. Basic theory and characteristic of electric arc. Transient recovery voltage. Switching overvolta	age. Low voltage p	rotection		
	apparatuses.				
BE5B15EN1	Power Engineering 1	Z,ZK	5		
The course informs	students about basic principles and topologies of electrical transmission and distribution systems. There are explained key system e	lements and their	parameters,		
	steady, transient and failure phenomena, main rules for dimensioning and protecting.				
BE5B15EN2	Power Engineering 2	Z,ZK	6		
	troduction to the field of thermodynamic processes in thermal power plants, energy balances and structure of various renewable and c				
-	idents will became also familiar with individual components of self consumption of power plants. The power generation and distribution	-	-		
systems and insula	tion materials. The fundamental theory of often used insulation materials and their propertis will be explained. Lightning and switching	overvoltages and	their impact		
	to the insulation of electric power system will be discussed at the end of the course.				

BE5B15MAA	Mathematical Applications	Z,ZK	4
	urse is to obtain knowledge about mathematic programs used in electrical engineering. Student will acquire basic knowledge about M mathematical model assessment.	ATLAB, MATHEM	ATICA and
	Business Economics	KZ	4
BE5B16EPD	DUSITIESS ECONOMICS ction of business, corporation life cycle. Cost classification, cost calculation, cost curves. Profit, production, price and cost relation. Ta	1 1	-
-	n-making. Business plan. Management functions, corporation organizational schemes. Processes and firm management. Výsledek s		
	zde: http://www.fel.cvut.cz/anketa/aktualni/courses/AE0B16EPD		
BE5B17EMT	Electromagnetic Field Theory	Z,ZK	6
This course presen	ts fundamentals of electromagnetic field theory and its applications. Analysis methods proper for static, stationary as well as dynamic	fields and waves in	free space
and on basic trans	mission lines are presented as well. This course provides students with physics - based wiev on studied effects, which is applied the	n on engineering p	roblems. At
the end of the cou	rse, all effects should not only be described, but quantified as well. Basic knowledge and insight into communication devices, system	s and techniques is	s provided,
	applicable not only to systems currently taught in other courses, but to future systems as well.		
BE5B31TES	Signal Theory	Z,ZK	5
BE5B31ZEO	Fundamentals of Electrical Circuits	Z,ZK	5
-	bes fundamental methods of electrical circuit analysis. After a brief introductory part where the difference between an electrical devic		
	sive and active circuit elements are then defined. Next, basic circuit quantities are defined; lectures are then focused on important la ircuit theorems, an analysis of DC circuits, AC circuits, first-order and second-order circuits are described. Finally, a brief description of		
	e transform, pulse excitation) is done. The seminars are focused on getting a theoretical experience in analysis of electrical circuits, s	-	
	and simple measurement. Výsledek studentské ankety p edm tu je zde: http://www.fel.cvut.cz/anketa/aktualni/courses/AE2B3		Simulations
BE5B32PKS	Computer and Communication Networks	Z,ZK	6
	rse is to familiarize students with current trends in the switched local networks and the key functions of routing protocols in IP networ		-
	primarily practically then theoretically		
BE5B33ALG	Algorithms	Z,ZK	6
	algorithms development is constructed with minimum dependency to programming language; nevertheless the lectures and seminar		hon. Basic
data types a data	structures, basic algorithms, recursive functions, abstract data types, stack, queues, trees, searching, sorting, special application alg	jorithms. Students	are able to
design and constr	uct non-trivial algorithms and to evaluate their affectivity. Výsledek studentské ankety p edm tu je zde: http://www.fel.cvut.cz/anketa/a	aktualni/courses/AE	E4B33ALG
BE5B33KUI	Cybernetics and Artificial Intelligence	Z,ZK	6
	uces the students into the field of artificial intelligence and gives the necessary basis for designing machine control algorithms. It adv		-
	rithms by including uncertainty in state transition. Students are introduced into reinforcement learning for solving problems when the		
which also connect	ts the artificial intelligence and cybernetics fields. Bayesian decision task introduces supervised learning. Learning from data is demo	onstrated on a linea	ar classifier.
	Students practice the algoritms in computer labs.	774	0
BE5B33PGE	Programming for Engineers	Z,ZK	6
BE5B33PRG	Programming Essentials		6
The course locuses	on understanding and mastering basic design principles of algorithms. It develops data abstraction coupled with the essential prograu is on creating readable and reusable programs.	inning patterns. In	e empriasis
BE5B33RPZ	Pattern Recognition and Machine Learning	Z,ZK	6
	ions of the statistical decision problem are presented. The necessary knowledge about the (statistical) relationship between observa		-
	ng on the raining set. The course covers both well-established and advanced classifier learning methods, as Perceptron, AdaBoost, S		-
	course is also part of the inter-university programme prg.ai Minor. It pools the best of AI education in Prague to provide students with		
	into the field of artificial intelligence. More information is available at https://prg.ai/minor.		
BE5B34ELP	Electron Devices	Z,ZK	5
	ces the basic theory, principles of operation and properties of electron devices. Physical principles of operation, device structures an		
	uate models for small- and large-signal. Basic applications in analogue and digital electronics are examined. In seminars and labs, st		
principles of device	e simulation, measurement of device characteristics and extraction of device parameters. Operation of electron devices in electronic of the Spice simulator. We lead to a students is a device of the students of the Spice simulator.		lyzed using
	the Spice simulator. Výsledek studentské ankety p edm tu je zde: http://www.fel.cvut.cz/anketa/aktualni/courses/AE2B34EL Microcontrollers		6
BE5B34MIK	burse is to make students acquainted with recent interesting applications, smart sensors circuits and peripherals handled by microcol	Z,ZK	6 udents will
-	own application and measure its properties. Because of usage of a programming language C it will be possible to focus on the practi		
BE5B35APO	Computer Architectures	Z,ZK	6
	overview of basic building blocks of computer systems. Explanation starts from hardware side where it extends knowledge presente		
Structures of comp	uter systems. Topics cover building blocks description, CPU structure, multiple processors interconnections, input/output subsystem	and basic overview	of network
and buses topolog	ies. Emphasis is placed on clarification of interconnection of hardware components with software support, mainly lower levels of ope	rating systems, dev	vice drivers
	techniques. General principles are more elaborated during presentation of examples of multiple standard CPU architectures. Exercise		
software view	v to the contrary. Students are lead from basic programming on CPU level to the interaction with raw hardware. Výsledek studentské	ankety p edm tu je	e zde:
DEEDOEADI	http://www.fel.cvut.cz/anketa/aktualni/courses/AE0B36APO		
BE5B35ARI	Automatic Control	Z,ZK	7
	e of automatic control. Introduction to basic concepts and properties of dynamic systems of physical, engineering, biological, econon nciples of feedback and its use as a tool for altering the behavior of systems and managing uncertainty. Classical and modern methor		
	systems. Students specialized in systems and control will build on these ideas and knowledge in the advanced courses to follow. Stu	-	-
	ms will find out that control is a inspiring, ubiquitous and entertaining field worth of a future cooperation. Výsledek studentské ankety		
	http://www.fel.cvut.cz/anketa/aktualni/courses/AE3B35ARI	-	
BE5B35LSP	Logic Systems and Processors	Z,ZK	6
	oblasti základních hardwarových struktur výpo etních prost edk , jejich návrhu a architektury. Podává p ehled o možnostech provád		
	vestav ných procesorových systém s perifériemi na moderních programovatelných logických obvodech FPGA, které se dnes širc		
	popsat obvody v jazyce VHDL po ínaje logikou p es složit jší sekven ní obvody až k praktickým návrh m kone ných automat (FSM)		
navrnu pomoci sim	ulace obvod . Ve cvi ení se eší praktické úlohy s využitím vývojových desek používaných na stovkách p edních univerzit po celém procesoru RISC-V prací s pam ti cache a proudovým zpracováním instrukcí	SV T . VYKIAD KON	I STRUKTUROU
REEDOORNE	procesoru RISC-V, prací s pam ti cache a proudovým zpracováním instrukcí.	Z,ZK	E
BE5B38SME	Sensors and Measurement I instruments for measurement of electrical quantities, AD and DA converters, sensors focused to use in robotics and automation, int	1 ' 1	6 ethods of
	decreasing uncertainties. Výsledek studentské ankety p edm tu je zde: http://www.fel.cvut.cz/anketa/aktualni/courses/AE3B38	•	
L			

BE5B99CPL	C Programming Language	Z,ZK	6		
The course provide's complete knowledge of the C programming language regarding a program structure operation, memory access, and multi-thread applications. The course emphasis					
a ?good? progra	mming style to develop clean, easy-to-read, and re-usable code. Students are introduced into the process of the source code compile	ation and active de	bugging.		
Lectures introduce	basic code structures and demonstration applications which link together partial constructs and practical coding aiming for cleanlines	ss and structure of	the source		
code, computationa	l efficiency optimized using code profiling and debugging. Students are introduced into the fundamental principles of parallel multi-thread	programming, syn	chronization		
me	echanism and multi-thread application models. The end of the course presents introduction to principles of object oriented programm	ing and C++.			
BE5B99PRO	Project	Z	10		
BEBAP20	Bachelor thesis	Z	20		
BEEZB	Safety in Electrical Engineering for a bachelor's degree	Z	0		
Školení seznamuje	studenty všech program s riziky a p í inami úraz elektrickým proudem, s bezpe nostními p edpisy pro obsluhu a práci na elektric	kých za ízeních, s	ochranami		
p ed úrazem elel	strickým proudem, s první pomocí p i úrazu elektrickým proudem a dalšími bezpe nostními technickými opat eními v elektrotechnice	. Studenti získají p	ot ebnou		
	elektrotechnickou kvalifikaci pro innost na VUT FEL.				
BEEZZ	Basic health and occupational safety regulations	Z	0		
Školení je sou ástí systému povinné pé e fakulty o bezpe nost a ochranu zdraví p i práci na VUT v Praze. Studenti všech program bakalá ského studia tímto absolvují povinné					
základní školení BOZP. Školení je povinné dle platné sm rnice d kana.					

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