## Study plan

## Name of study plan: Electrical Engineering and Computer Science (EECS)

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: 161 Elective courses credits: 19 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: 122 The role of the block: P

Code of the group: BEECSBAP Name of the group: Bachelor Thesis Requirement credits in the group: In this group you have to gain 20 credits Requirement courses in the group: In this group you have to complete at least 1 course Credits in the group: 20 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
BBAP20	Bachelor thesis Roman mejla Roman mejla (Gar.)	Z	20	12S	L,Z	Ρ

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20

Characteristics of the courses of this group of Study Plan: Code=BEECSBAP Name=Bachelor Thesis

BBAP20 Bachelor thesis

Code of the group: BEECSP

Name of the group: Compulsory subjetcs of the programme

Requirement credits in the group: In this group you have to gain 102 credits

Requirement courses in the group: In this group you have to complete at least 18 courses Credits in the group: 102

Note on the aroup:

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
BE5B33ALG	Algorithms Marko Genyk-Berezovskyj, Daniel Pr ša Daniel Pr ša Marko Genyk-Berezovskyj (Gar.)	Z,ZK	6	2P+2C	z	Р
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	Р
BE5B16EPD	Business Economics Tomáš Podivínský <b>Tomáš Podivínský</b> Tomáš Podivínský (Gar.)	KZ	4	2P+2S	Z,L	Р
BE5B01MA1	Calculus 1 Paola Vivi <b>Paola Vivi</b> 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	Р
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	Р

BE5B34ELP	Electron Devices	Z,ZK	5	2P+2L	L	Р	
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	Р	
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	
BE5B99PRO	Project Jaroslav Knápek, Jan Jandera <b>Jan Jandera</b> 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	
Characteristics of the	courses of this group of Study Plan: Code=BEECSP Name=Co	ompulsory s	ubjetcs	of the pro	gramme		
BE5B33ALG Alg In the course, the algorithms data types a data structures, Students are able to design a	orithms development is constructed with minimum dependency to programming language; nev basic algorithms, recursive functions, abstract data types, stack, queues, trees, search and construct non-trivial algorithms and to evaluate their affectivity.	vertheless the lea	ctures and cial applica	Z seminars are tion algorithm	, <b>ZK</b> based on Py is, Dynamic p	6 thon. Basic programming.	
BEEZZ Ba	sic health and occupational safety regulations				Z	0	
The guidelines were worked which was provided by the R	out based on The Training Scheme for Health and Occupational Safety designed for er ector's Office of the CTU. Safety is considered one of the basic duties of all employee:	nployees and stu s and students. T	idents of the	e Czech Tech dge of Health	and Occupat	ity in Prague, tional Safety	
regulations forms an integral	and permanent part of qualification requirements. This program is obligatory.						
BE5B16EPD Bu	siness Economics	luction price and	d cost rolati	ion Taxos Fir		4 us and	
investment decision-making.	Business plan. Management functions, corporation organizational schemes. Processe	s and firm mana	gement.				
BE5B01MA1 Calculus 1 Z,ZK 7							
It is an introductory course to calculus of functions of one variable. It starts with limit and continuity of functions, derivative and its geometrical meaning and properties, graphing of							
series.		giai ana ito appi				r to ruyior	
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	ween curve and s	surface integ	grals. Fourier	series are als	o introduced.	
This course introduces stude	rerential Equations&Numerical Methods	s) and also to bsi	cs of nume	∠ ∣ rical methods	.,∠K   (errors in cal	<i>i</i> culations and	
stability, numerical solutions	of algebraic and differential equations and their systems). The course takes advantage	of the synnergy	between th	neoretical and	practical poi	nt of view.	
BE5B01DMG Dis	crete Mathematics and Graphs			Z	,ZK	5	
propositional and predicate le	ntroduce students to fundamentals of Discrete Mathematics with focus on electrical engo	gineering. The co us on equivalenc	es and par	e course cove tial orderings:	rs fundamen	tais or ation modulo:	
algebraic structures including	g Boolean algebras. Further, the course covers basics of the Theory of Graphs.			3.	- <b>J</b> - <b>J</b> - <b>J</b>	,	
BE5B34ELP Ele	ectron Devices			Z	,ZK	5	
This course introduces the b	asic theory, principles of operation and properties of electron devices. Physical principles for small, and large signal. Basic applications in analogue and digital electronics are	es of operation, (	device struc	ctures and ch d labs_studer	aracteristics	are explained	
principles of device simulation	in, measurement of device characteristics and extraction of device parameters. Operati	ion of electron de	evices in ele	ectronic devic	es is then an	alyzed using	
the Spice simulator.					<u>.</u>		
BE5B31ZEO Fu	ndamentals of Electrical Circuits			Z	,ZK	5	
The subject describes fundamental methods of electrical circuit analysis. After a brief introductory part where the difference between an electrical device and its models is introduced,							
electrical circuits. Circuit theorems, an analysis of DC circuits, AC circuits, first-order and second-order circuits are described. Finally, a brief description of more sophisticated methods							
of analysis (Laplace transform, pulse excitation) is done. The seminars are focused on getting a theoretical experience in analysis of electrical circuits, supplemented with simulations							
and simple measurement.							
The course covers standard	BE5BUTLAL   Linear Algebra   Z,ZK   8						
eigenvalues and eigenvectors. Matrix similarity, orthogonal bases, and bilinear and quadratic forms are also covered.							
BE5B15MAA Ma	thematical Applications	vill acquire basic	knowledge	about MATI A	,ZK	4 ATICA and	
mathematical model assess	nent.	aoquiro basio	omeaye				
BE5B34MIK Mic	crocontrollers	nd norinherals -			,ZK	6	
program their own applicatio	n and measure its properties. Because of usage of a programming language C it will be	e possible to foci	us on the p	ractical part o	f the realizat	ion.	

BE5B02PH1 Physics 1	Z,ZK	8				
The basic course of physics at the Faculty of Electrical Engineering - Physics 1, is devoted to the introduction into two important areas of physics. The	e first one is a clas	ssical mechanics				
and the second one is the 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 rigid bodies. The students should be able to solve basic problems dealing with the description of mechanical systems, which t	hey can meet dur	ing 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 in the study of electrical circuits, theory of electrotechnical materials or radioelectronics.	urse is required for	the study of the				
consecutive course Physics 2.						
BE5B02PH2 Physics 2	Z,ZK	7				
Within the framework of this course the students will first of all learn foundations of thermodynamics. Following topic - the theory of waves - will give	to the students ba	asic 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 waves charact	er. 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	he student?s gene	eral 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	e and will allow the	m to understand				
the principles of novel technologies and functioning of new electronic devices.						
BE5B01PRS Probability and Statistics	Z,ZK	7				
Introduction to the theory of probability, mathematical statistics and computing methods together with their applications of praxis.						
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	is. The emphasis				
is on creating readable and reusable programs.						
BE5B99PRO Project	Z	10				
An individual student project. The student works on a topic of his or her interest under supervision of a faculty staff member. The topic selection is su	upposed to be cor	sulted with the				
tutor. Aside the individual work and consultancies the project course is accompanied by lectures and practical seminars about economic aspects of projects, presentation skills and						
technical writing.						
BEEZB 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 oper	ation of it. This inti	oductory course				
contains fundamentals of Safety Electrical Engineering. In this way the students receive qualification of instructed person that enables them to work	on electrical equi	pment.				

## Name of the block: Compulsory elective courses Minimal number of credits of the block: 39 The role of the block: PV

Code of the group: BEECSPV

Name of the group: Compulsory subjetcs of the branch

Requirement credits in the group: In this group you have to gain at least 39 credits (at most 81) Requirement courses in the group: In this group you have to complete at least 7 courses

Credits in the group: 39 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
BE5B35ARI	Automatic Control Petr Hušek Martin Hrom ík (Gar.)	Z,ZK	7	4P+2L	L	PV
BE5B99CPL	<b>C Programming Language</b> Tomáš Krajník, Yuliia Prokop <b>Jan Faigl</b> Jan Faigl (Gar.)	Z,ZK	6	2P+2C+5D	Z	PV
BE5B32PKS	Computer and Communication Networks Pavel Bezpalec Pavel Bezpalec	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	<b>Cybernetics and Artificial Intelligence</b> Petr Pošík, Tomáš Svoboda <b>Tomáš Svoboda</b> (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	<b>Power Engineering 1</b> 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

Characteristics of the courses of this group of Study Plan: Code=BEECSPV Name=Compulsory subjetcs of the branch

Foundation course of automatic control. Interactions to balance of systems of physical, engromering, biological, encronnics, relates and informating automatic society and on an encry consorts. Observation of systems and encourse of the balance of systems. Subservation of the balance of systems of the balance of systems. Subservation of the balance of systems of the balance of systems. Subservation of the balance of systems of the balance of systems. Subservation of the balance of systems of the balance of systems. Subservation of the balance of systems of the balance of systems. Subservation of the balance of systems of the balance of systems of the balance of systems. Subservation of the balance of systems of the balance of systems of the balance of systems. Subservations and control states of the balance of systems of the balance of systems of the balance of systems of the balance of systems. Subservations and control states of the balance of systems of the system of systems of the balance of systems of the system of systems of the balance of systems of the system of systems of the balance of systems of the system of sy	BE5B35ARI Automatic Control	7 7K	7			
nature, Each properties of beschasts and is to ase as is not or attering the beschard of systems and control week process. Subsets specifications and extenders and should be the advanced occurses to Moute. Students of other strategies and programs all lide or the advanced occurses to Moute. Students of other strategies and should be process. The advanced occurses to Moute. Students of other strategies and should be process. The advanced occurses to Moute. Students of other strategies and should be process. The advanced occurses to Moute. Students of the strategies of provide comparison of the comparison of the strategies of provide comparison. The other advanced occurses to Moute. Students of the strategies of provide comparison of the strategies of provide comparison of the strategies of provide comparison. The other advanced interview of the strategies of provide comparison of the strategies of the strategi	Foundation course of automatic control. Introduction to basic concepts and properties of dynamic systems of physical, engineering, biological, econ	omics. robotics an	d informatics			
automatic control systems. Students specialized in systems and control all libbal means bear and knowledge in the advanced courses, building. Students of other bannelines and programming leady on the data exceptions. The source course in the course present in course is a simulation of the programming leady on the data exceptions. The source course and source decourses in the course present in the process of the source course organisms and accore decourses in the course present introduction is principal or gramming, experimentation of the course present introduction is principal or gramming and the data decourse present introduction is principal or gramming and the data decourse present introduction is principal or gramming and the data decourse present introduction is principal or gramming and the data decourse is the familiance automatic automatic and the source is to familiance automatic automatic and the course is to familiance automatic automatic and the source is to familiance automatic automatic and the source is to familiance automatic automatic and the present introduction is principal or gramming and the data decourse of the course is to familiance automatic	nature. Basic principles of feedback and its use as a tool for altering the behavior of systems and managing uncertainty. Classical and modern meth	ods for analysis a	nd design of			
programs will do ur that control is a neptime_localization and relationing parks with of a fulline occessed. EESB305CP EESB305CP EESB305CP EESB305CP ECUT approximation and scaled executions and amountains applications which in the tophen partial controls and particle of the course emphasis and programming single is developed particle in the counter and annotation applications which in the tophen partial controls and particle of the course emphasis and programming single is developed particle in the counter and annotations applications which in the counter particle counter and particle course and particle in the course and the co	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			
BESEBSOPCIL         C Programming Language         2,XK         6           Incourse product sorticity of the Congramming inspace regarding a program structure sporelist, memory access, and multi-freed applications. In socie access constructure of a derive debugging.         1           Letture instructure access instructure access instructure debugging.         1         0         1         0 </td <td>programs will find out that control is a inspiring, ubiquitous and entertaining field worth of a future cooperation.</td> <td></td> <td></td>	programs will find out that control is a inspiring, ubiquitous and entertaining field worth of a future cooperation.					
The outse provides complete involved of the C programming language regarding a program structure operation, memory access, and mult thread splications that is under outset south and provides and the outperture of the process of the source code completions and access the data and access the set of the curve code, anarytaking and access the set of the curve code, anarytaking and access the set of the source code completions and access the set of the source code completions and access the set of the source code, anarytaking and the set of the source code completions and access the source code completions of access the code to access the access the set of the code to access the access the set of the set	BE5B99CPL C Programming Language	Z,ZK	6			
a "good" programming alye to develop claim, aesy-to-read, and re-usable code. Students are introduced into the process of the source code contraduced and procession within its special procession and the student and procession and procession and the student and procession and the special exceeding and the student and procession and the special exceeding a	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			
Latures includes basic acids subures and demonstration applications which ink tegether participation and particul aciding arring for celetarians, synchronizang, synchroniz	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	ilation and active	debugging.			
code, computational efficiency perivade also goods profileg and debugging. Subcrists are introduced in the forward process of the course of a subcrist and the subcrists with course of a subcrist and course systems. Introduction to primosite or doces criterical corporating and C++.  EEEB328PKS Computer and Communication Networks  EEEB328PKS Computer Architectures  Z.ZK 6  Bubble provides werevise of balance bubbles plocids of computer systems. Explanation tatarts from hardwers also whare it adouts involvideg presented in the provides developed assignment of the course of the systems. Explanation tatarts from hardwers also whare it adouts involvideg presented in the provide developed assignment of the course	Lectures introduce basic code structures and demonstration applications which link together partial constructs and practical coding aiming for clean	liness and structur	e of the source			
mechanism and multi-freed application models. The and of the course presents introduces to price of object orienting produces in P Aurol. EESB32PKS DECOMPUTER AND Communication Devices in the work-has local networks and the key functions of routing protocols in P Avertices. The course is aread rather primary practically the networks of the accurate is the small mater status and the key functions of routing protocols in P Avertices. The course is aread and the function of the course is a more the function of the course is a more theory of the course is a more theory of the course is a more theory of the course is a more the course is a more theory of the course is a more to the	code, computational efficiency optimized using code profiling and debugging. Students are introduced into the fundamental principles of parallel multi-thr	ead programming,	synchronization			
BEEB32PKS         Computer and Communication Networks         Z.2K         6           Betain of the occurs is to huminaze students with current time in the switched local networks and the key functions of routing protocols in P networks. The course is and after privately includes the building block of computer systems. Exploration starts from hardware side where it adentis howing presented in the prevous locations of includes studies includes the building block and computer system.         Z.2K         6           Subject provides overview of basics         Description of the system.         Exploration of the system.	mechanism and multi-thread application models. The end of the course presents introduction to principles of object oriented programming and C++.					
The aim of the course is to femiliate students with current tends in the switched local networks and the key functions of routing protocols in IP networks. The course is aimed rafter privary including the networks and the key functions of routing protocols in IP networks. The course is aimed rafter of mainty including the networks of the switch is course of a single protocols on charding on the intercenced on the hardware saper. Networks of provide the protocols on the switch of the provide of the switch of the swi	BE5B32PKS Computer and Communication Networks	Z,ZK	6			
primate preduction the indexedual procession of the second	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			
BE6B336HO   Computer Architectures   2.2K   6 Biological protections downless of computer systems. Explanation starts from hardware side where it extends knowledge presented in the prevous leature of disturbance of computer systems. Topics cover building blocks description, CPU structure, multiple processors interconnections, input/codupt tabulas of coveriance of the prevous leatures of the soles topological. Explanation is prevented with the soles topological prevented with the hardware components with the hardware components with the hardware components with the hardware spacer. The soles of the prevented with the hardware spacer. The soles of the prevented with the hardware spacer. The soles of the prevented with the hardware spacer. The soles of the prevented with the hardware spacer. The soles of the prevented with the hardware spacer. The soles of the prevented with the hardware spacer. The sole of the prevented with the hardware spacer. The sole of the prevented with the hardware spacer. The sole of the prevented with the hardware spacer with the h	primarily practically then theoretically.		-			
Subject provides overview of beaix building bicks of computer systems. Explanations starts from hardware subject where it estends knowledge presented in the previous lectures of encode and basis transmissions. Simplifying and the section of hardware components with software support, markly bases in where it descriptions. The subject is and basis explored of the transmission framework of analysis are based transmission of the sections with new hardware. EEESB3XUU ESESSINU ESES	BE5B35APO Computer Architectures	Z,ZK	6			
Shruchure in comparter systems, lopes cover building tooks description, CPU structure, multiple procession interconnections, multipuolity autosystem and association with a structure and the compare interconnection with a structure and the lead of multiple procession with a structure and the lead of multiple of and the structure interconnection with a structure and the lead of multiple of a structure interconnection with a structure and the lead of multiple of a structure interconnection with a structure and the lead of multiple of a structure interconnecting and the structure interconnection interconnecting and the structure interconnection interconnecting and the structure interconnection inter	Subject provides overview of basic building blocks of computer systems. Explanation starts from hardware side where it extends knowledge present	ed in the previous	lectures of			
and obset spoogles. Emphasis is packed on clamatication of interconneution of nationate components with advance support, many downet whell of operating systems, device chrem software view to the contrary. Students are lead run batic programming on CPU level to the interaction with new hardware.           EEEB33KU         Cybernetics and Artificial Intelligence         ZZK         6           The course introduces the students into the field of antificial intelligence and cybes the necessary basis for designing machine control algorithm. It advances the knowledge of state pace search agorithms by inducing necetinary in state intradionation and introduce into theoremonit taming to a caving problem when the state transitions are unknown, which also composits the artificial intelligence and cyberalities fields. Bayesian decision task intraduces supervised learning. Learning from data is demonstrated on a linear classifier. Special electro machines, inclusion motors, synchronous generations and motors. Special electro machines, suchators. Static components. Electronechanical energy conversion. Fational and converters - DC machines, inclusion motors, synchronous generations and motors. Special electro machines, suchators. Static components. Electronechanical energy conversions. Analysis methods proper for static, stationary as well as cynamic fields and waves in free space discussion and complex special static stationary is a well as cynamic fields and waves in free space discussion synchronous generations. Learning from data is operation by individue generations and motors. Special electron again the course provides tatic with hysics: - tabed or on static, stationary as well as cynamic fields and waves in free space discussion and control spece systems and techniques is provided.           EEEB17EMI         Electromagnetic Field Theory         Z,ZK         6           The c	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 inflamation between the field principles are inflate elaborated outing presentation of the starting to the field of the starting of the starting in the starting of the st	and buses topologies. Emphasis is placed on clarification of interconnection of nardware components with software support, mainly lower levels of c	perating systems,	device drivers			
backets         Cybernetics         Z,ZK         6           ESEB33KU         Cybernetics         K         6           The course introduces the students into the field of antificial intelligence and gives the necessary basis for designing machine control algorithms. It advances the konviledge of stude genes aearch algorithms by including uncertainty in state matines. Students an introduces in the intervention of state students in the state transitions of the state transitions. Students practices the attitual intelligence and cybernetics fields. Bayesian decision task introduces supervised learning. Learning from data is demonstrated on a linear classitier. Studies convertes: transformers. There are presented operational principles, main constructional achiever and home. Special electric machines, students. Static convertes: transformers. There are presented operational principles, main constructional achiever and home. Special electric machines, students. Static convertes: transformers. There are presented avertices of electric machines, induction motors, synchronous genetators and mators. Special electric machines, attuators. Static convertes: transformers. There are presented avertices and transition of electromagnetic field Theory         Z,ZK         6           This course protodes the student work with the discusse bit works and course, bit of batter students with principles. Theory within a communication devices, system and technique protodes and transition of electromagnetic field Theory         Z,ZK         6           The course introduces the student and the document model within discusse students with principles. The student weel within discusse and were within a student weel withing and the document model within a studentable andoce student weel within the atransite. Weel Rest andout	and virtualization techniques. General principles are more elaborated during presentation or examples or multiple standard CPO architectures. Exert	cises are more loc	used on the			
DECDSOND         CuCA         O           The course introduces the students into the field of articlian limitigence and gives the necessary basis for designing machine control algorithms. It advances the knowled of states space search algorithms by including uncertainty in state transitions. Buildents are introduced into reinforcement learning for noticing produces when the state transitions are unknown, which also comercents. Electromechanical energy convension. Rotational converters - DC machines, induction motors, synchronous generators and motors. Special electric machines, and uncertainty in the produce states with a different energy convension. Rotational converters - DC machines, induction motors, synchronous generators and motors. Special electromechanical energy convension. Rotational converters - DC machines, induction motors, synchronous generators and motors. Special electromechanical energy convension. Rotational converters - DC machines, induction motors, synchronous generators and motors. Special electromechanical energy convension. Rotational converters - DC machines, induction motors, synchronous generators and motors. Special electromechanical energy convension. Rotational converters - DC machines, induction motors, synchronous generators and motors. Special electromechanical energy convension. Rotational converters energy convension. Rotational converters energy convension. Rotational converters energy convension. Rotational converses that devices and rotatic stationary as well as characteristic. Jung 2000 (2000)		774	0			
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Notice of the adjustice in tengence and systemeter flexible         Implicible         Implicible <td>space search algorithms by including uncertainty in state transition. Students are introduced into reinforcement learning for solving problems when the which also connects the artificial intelligence and cybernetics fields. Bayesian decision task introduces supervised learning. Learning from data is do</td> <td>monstrated on a</td> <td>inear classifier</td>	space search algorithms by including uncertainty in state transition. Students are introduced into reinforcement learning for solving problems when the which also connects the artificial intelligence and cybernetics fields. Bayesian decision task introduces supervised learning. Learning from data is do	monstrated on a	inear classifier			
Control         Electric         Carl Achinery and Apparatus 1         Z,ZK         5           Electric drive and its components. Electromechanical energy conversion. Relational converters - DC machines, induction motors, synchronous generators and motors. Switching theory.         Switching overvoltage. Low voltage protection apparatuses           BESB14SPT         Electric drive and its components. Electromechanical energy conversion. Relational converters - DC machines, induction motors, synchronous generators, applications. Switching theory.         Name           Inscrete transformer. The rear are presented operational principles, main constructional scheme and characteristic, applications. Switching theory and variant free space and on basic transmission interes are presented as well. This course prevides students with physics - based view on studied effects, which is applied then on engineering problem. At the end of the course, all effects should not only to descretand, but to future systems as well.         ESB31SSP         Logic Systems and Processors         Z,ZK         6           The course minoduces the basic hardware isotatis of computing resources, their design, and architecture. It provides an overview of the possibilities of performing data coperations at the hardware level and the design of embedded processor systems and motors. Systems and performance and performing data coperations at the hardware level and the design of embedded processor systems with perphetias on modern FPGA programmable logic circuits, which are increasingly widely used todag. Suberts are the course indicates and performing data coperations and basicorestructure scheme anorediters. Specification Proced	Students practice the algorithms in computer labs	entonstrated on a	inear classifier.			
BEDB 10401         EVAID MADIMENT (AUD APplatus)         DLACK         G           Beckin drive and its components. Electromechanical energy conversion. Rotational principles, main constructional schemes and characteristics, applications. Switching theory, interaction between turn-off switch and switched circuits. Basic theory and taranteristic of electricit arc. Transient recovery voltage. Switching theory, interaction between turn-off switch and switched circuits. Basic theory and ta applications. Analysis methods proper for static, stationary as well as dynamic fields and waves in free space and on basic transmission lines are presented as well.         ESE 17EV         I         E         I         <	PEEP14SD1 Electric Mechanismic Computer labs.	774	5			
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Interaction between turn-off switch and switched circuit. Bask theory and capation of proper for static, stationary as well as (characteristic of electric) arc. Transient recovery voltage. Switching overvoltage, between turn-off switch and switched circuit. Bask theory and its applications. Analysis methods proper for static, stationary as well as (characteristic) and on basic transmission lines are presented as well. This course provides students with physics - based were were student effects, shitching overvoltage. Switching overvoltage, and on basic transmission lines are presented as well. This course provides students with physics - based were were studied effects, which as applied then on on engineering problems. At the end of the course, all effects should not only be described, but quantified as swite. Basic knowledge and insight into communication devices, systems and techniques is provided. applicable not only to systems currently taught in other courses, but of future systems as well. <b>BE5B375LSP</b> Logic Systems and Processors <b>Z,ZK</b> 6  The course, all effects should not only be described, but quantified as well. Basic knowledge and insight into communication devices, systems and techniques is provided. and insight evel as the advance structures of computing resources, their design, and architecture. It provides an overview of the possibilities of performing data operations at the hardware level and the design of methoded processor systems with peripherals on modern FPGA programmable logic circuits, which are increasing Work used todes. Students with RIGV processor structure, cache, and pipeline processing. <b>BE5B315W</b> Materials for Power Electrical Engineering <b>Z,ZK</b> 5  A first a physical description of basic properties of materials for electrical engineering, with properties of mica, glass and their applications, with environmental conductive, joining, with materials and avaitable and their applications. <b>BE5B315W</b> Material Bittelliser, Newer Interfusion and Machine Learning <b>Z,ZK</b> 6  The basic	Lieute une and its components. Lieutenentralinear energy concentrational converties - Do machines, induction motors, synchronous gene machines actuators Static converters - transformers There are presented operational principles, main constructional scheme and characteristics -	annlications Switch	special electric			
Best of the end of th	Interaction between turn-off switch and switched circuit. Resisc theory and characteristic of alexit or Transient recovery voltana. Switch and	applications. Switch	protection			
BESB17EMT         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 dynamic fields and waves in free space and on basic transmission lines are presented as well. This course provides students with physics - based view on studied effects, which is applied then on engineering problems. At the end of the course, all effects should not only be described, but quantified as well. Basic knowledge and insight into communication devices, systems and techniques is provided.           BEEB33CLSP         Logic Systems and Processors         Z,ZK         6           The course introduces the basic hardware structures of compting resources, their design, and architecture. It provides an overview of the possibilities of proforming data operations at the hardware fixed and basic processor systems with peripherals on modern FPGA programmable logic circuits, which are increasingly widely used today. Students will ach relate the correct design procedure using circuit simulation. Practical problems are solved using development boards used at hundreds of leading universities around the world. The course increat design processing.           BEE5B33WE         Materials for Power Electrical Engineering         S,ZK         5           At first a physical description of basic properties and basic types of meterical engineering is splate activation. Symper conductors, synperconductors, with area used in power lectrical engineering. With properties of mice, glass and their applications, with environmental conductors, splate description of basic properties and basic types of meterical engineering.         Z,ZK         6	apparatuses	age. Low voltage				
DEDSTRIM         Execution regenerate field theory and its applications. Analysis methods proper for static, stationary as well as dynamic fields and waves in free space and on basic transmission lines are presented as well. This course provides students with physics - based view on studied effects, which is applied then on engineering problems. At the end of the course, all effects aboutd not only be described, but quantified as well. Basic knowledge and insight into communication devices, systems and techniques is provided.           BEEB35LESP         Logic Systems and Processors         Z,ZK         6           The course introduces the basic hardware structures of computing resources, their design, and architecture. It provides an overview of the possibilities of performing data operations at the hardware level and the design of enhedded processor systems with peripherals on modern FPGA programmable logic circuits, which are increasingly widely used today. Students willican their description in VHOL, from logic to more complex sequential circuits to practical linite state machine (FSM) designs. They will also master the correct design procedure using circuit simulation. Practical problems are solved using development boards used at hundreds of leading universities around the world. The course ends with RISC-V processor structure, cache, and peeline processing.         Z,ZK         5           BE5B13VE         Materials for electrical engineering         Z,ZK         5           Affirst a physical description of basic types of materials for electrical engineering, with properties of mice, glass and their applications, with environmental conductive, joning, with materials for electrical engineering, with properties of mice, glass and their applications, with environmental conductive structures, and Nuura	BE5B17EMT Electromagnetic Field Theory	7 7K	6			
and on basic transmission lines are presented as well. This course provides students with physics - based view on studied effects, which is applied then on engineering problems. At the end of the course, all effects should not only be described, but quantified as well. Basic knowledge and insight into communication devices, systems and techniques is provided, applicable not only to systems currently taught in other courses, but to future systems are well. BE583SLSP Logic Systems and Processors Logic Systems and Processors systems with peripherals on modern FPGA programmable logic circuits, which are increasingly widely used today. Students will earn their description in VHD, from logic to more complex sequential circuits to practical finite state machine (FSM) designs. They will also master the correct design procedure using circuit simulation. Practical fiss for Processor structure, cache, and pipeline processing. BE5813MVE Materials for Prover Electrical Engineering. At processor structure, cache, and pipeline processing. BE5813MVE Materials for Prover Electrical Engineering, are presented. The stress is put on relationships between properties, technology and the use. The student will meet, inhibitor the electring and their applications. BE5833MVE Materials for Prover Steerical engineering, with proveries of materials and semiconomental conductive synony and the use. The student will meet, inhibitor due to modern and Machine Learning DE5833MVE Technology and the use. The student will need by learning on the raining set the course learning and processors is acquired by learning on the raining set. The course into and with selected manomaterials and their applications. BE5833TVE Pattern Recognition and Machine Learning Desting the tailogic of the inter-inversity programme prg.al Minor. BE5833TVE Pattern Recognition and Machine papiloations. BE5833TVE Pattern Recognition and Machine course, but well-established and advanced classifier learning methods, as Perceptron, AdaBoost, Support Vector	DEDUTY INTERPRESENT END ADDRESS THE ADDRESS ADDRES	mic fields and way	o es in free space			
the end of the course, all effects should not only be described, but quantified as well. Basic knowledge and insight into communication devices, systems and techniques is provided, application of noty to systems aurently taught in other courses, but to future systems as well. BEBB35LDSP Logic Systems and Processors The course introduces the basic hardware structures of computing resources, their design, and architecture. It provides an overview of the possibilities of performing data operations at the hardware structures of computing resources, their design, and architecture. It provides an overview of the possibilities of performing data operations at the hardware structures of computing resources, their design, and architecture. It provides an overview of the possibilities of performing data operations will earn their description in VHDL, from togic to more complex sequential circuits to practical finite state machine (FSM) designs. They will also master the correct design procedure using diruct is maintain. Practical problems are solved using development boards used at hundreds of leading universities around the world. The course ends with RISC-V processor structure, cache, and pipeline processing. BESD SIMVE Materials for Power Electrical Engineering. The presented. The stress is put on relationships between properties, technology and the use. The student will meet, in higher datait, with caramics for electrical engineering, are presented. The stress is put on relationships between properties, technology and the use. The student will meet, in higher datait, with caramics foroblem are presented. The necessary knowledge about the (statistical) relationship between observations and classes of objects is acquired by learning on the taining set. The course locasary knowledge about the (statistical) relationship between observations and classes of objects is acquired by learning on the taining set. The course books on the well statistical decision proved is valiable at https://prg.ai/minor. BESD SISDNE Desore SIT	and on basic transmission lines are presented as well. This course provides students with physics - based view on studied effects, which is applied	then on engineerin	a problems. At			
applicable not only to systems currently taught in other courses, but to future systems as well.       Z,ZK       6         BESB33LSP       Logic Systems and Processors       Z,ZK       6         The course introduces the basic hardware structures of computing resources, their design, and architecture. It provides an overview of the possibilities of performing data operations at the hardware level and the design of embedded processor systems with peripherals on modern FPGA programmable logic circuits, which are increasingly widely used today. Students will learn their description in VHDD, from logic to more complex sequential circuits to practical finite state machine (FSM) designs. They will also master the correct design procedure using circuit simulation. Practical problems are solved using development boards used at hundreds of leading universities around the world. The course ends with RISC-V processor structure, eache, and pipeline processing.       Z,ZK       5         BESB13MVE       Materials for Dower Electrical Engineering       Z,ZK       6         Statistical description of basic properties and basic types of materials of states is type to materials and with selected nanomaterials and their applications.       BESB13MVE       Z,ZK       6         BESB13MVE       Description and Machine Learning       Z,ZK       6       6         Statistical regimeering at Minor. It pools the basic of mulations is allogic at https://pr.al/minor.       BESB13MVE       Allogic AlaBoost. Support Vector Machines, and Neural	the end of the course, all effects should not only be described, but quantified as well. Basic knowledge and insight into communication devices, syst	ems and techniqu	es is provided.			
BE5B35LSP         Logic Systems and Processors         Z,ZK         6           The ocurse introduces the basic hardware structures of computing resources, their design, and architecture. It provides an overview of the possibilities of performing data operations at the hardware structures of computing resources, their design, and architecture. It provides an overview of the possibilities of performing data operations will learn their description in VHDL, from logic to more complex sequential circuits to practical finite state machine (FSM) designs. They will also master the correct design procedure using circuit simulation. Practical problems are solved using development boards used at hundreds of leading universities around the world. The course ends with RISC-V processor structure, cache, and pipeline processing.         Z,ZK         5           BE5B13MVE         Materials for Power Electrical Engineering at the advanced leading universities around the world. The course ends with RISC-V processor structure, cache, and pipeline processing.         Z,ZK         5           BE5B33RPZ         Materials for 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.         Z,ZK         6           BE5B33RPZ         Pattern Recognition and Machine Learning         Z,ZK         6         6           the basic of micris is asulates an thetry/programme prg ai Minor. It poosis the best of AI education in	applicable not only to systems currently taught in other courses, but to future systems as well.					
The course introduces the basic hardware structures of computing resources, their design, and architecture. It provides an overview of the possibilities of performing data operations at the hardware level and the design of embedded processor systems with peripherals on modern PFQA programmable logic circuits, which are increasingly widely used today. Students will learn their description in VHDL, from logic to more complex sequential circuits by parcial affinite state machine (FSM) designs. They will also master the correct design procedure using circuit simulation. Practical problems are solved using development boards used at hundreds of leading universities around the world. The course ends with RISC-V processor structure, cache, and pipeline processing.  ESB313NVE Materials for Power Electrical Engineering  At first a physical description of basic properties and basic types of materials for electrical engineering, are presented. The stress is put on relationships between properties, technology and the use. The student will meet, in higher detail, with caramist for electrical engineering, with properties of mica, glass and their applications, with environmental conductive joining, with materials for the basic formulations of the statistical decision problem are presented. The necessary knowledge about the (statistical) relationship between observations and classes of objects is acquired by learning on the raining set. The course covers both well-established and advanced classifier learning methods, as Perceptron, AdBoost, Support Vector Machines, and Neural Nets. This course is also part of the inter-university programme prag all Minor. It pools the best of Al education in Prague to provide students with a deeper and broader insight into the field of artificial intelligence. More information is available at https://pr.g.ai/minor. BESB1SPLN Power Engineering 2 Z,ZK 6 The course informs students about basic principles and topologies of electrical transmission and distribution systems. There are explained key s	BE5B35LSP Logic Systems and Processors	7 7K	6			
at the hardware level and the design of embedded processor systems with peripherals on modern FPGA programmable logic circuits, which are increasingly widely used today. Students will learn their description in VHDL, from logic to more complex sequential circuits to practical finite state machine (FSM) designs. They will also master the correct design procedure using circuit simulation. Practical problems are solved using development boards used at hundreds of leading universities around the world. The course ends with RISC-V processor structure, cache, and pipeline processing.  BEBB13MVE Materials for 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 carenic for electrical engineering, with properties of mica, glass and their applications, with environmental conductive joining, with materials for the strass is put on relationships between properties, technology and the use. The student will meet, in higher detail, with carenic for electrical engineering, with properties of mica, glass and their applications, with environmental conductive joining, with materials for the tastistical decision problem are presented. The necessary knowledge about the (statistical) relationship between observations and dasses of objects is acquired by learning on the raining set. The course covers both well-established and advanced classifier learning methods, as Perceptron, AdaBoost, Support Vector Machines, and Neural Nets. This course is also but also principes and topologies of electrical transmission and distribution systems. There are explained key system elements and their parameters, steady, transient and failure phenomena, main rules for dimensioning and protecting. BESB15EN1 Power Engineering 2 New Engineering 4 New Compension, and nucles to dimensioning and protecting. BESB15EN2 Power Engineering 4 New Compension, and protecting and protecting as the individual components of self consumption and distribut	The course introduces the basic hardware structures of computing resources, their design, and architecture. It provides an overview of the possibilit	ies of performing of	lata operations			
will learn their description in VHD_ from logic to more complex sequential circuits to practical finite state machine (FSM) designs. They will also master the correct design procedure using dircuit simulation. Practical problems are solved using development boards used at hundreds of leading universities around the world. The course ends with RISC-V processor structure, each appelleme processing.  BESB13MVE Materials for Power Electrical Engineering Z, and proved 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, 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, 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, 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 their details of the statistical decision problem are presented. The necessary knowledge about the (statistical) relationship between observations and classes of objects is acquired by leaning on the raining set. The course covers both well-estabilished and advanced classifier learning methods, as Perceptron, AdaBoots, Support Vector Machines, and Neural Nets. This course is also part of the inter-university programme prg ai Minor. It pools the best of Al education in Prague to provide students with a deeper and broader insight into the field of thermodynamic pro	at the hardware level and the design of embedded processor systems with peripherals on modern FPGA programmable logic circuits, which are increased at the hardware level and the design of embedded processor systems with peripherals on modern FPGA programmable logic circuits, which are increased at the hardware level and the design of embedded processor systems with peripherals on modern FPGA programmable logic circuits, which are increased at the hardware level and the design of embedded processor systems with peripherals on modern FPGA programmable logic circuits, which are increased at the hardware level and the design of embedded processor systems with peripherals on modern FPGA programmable logic circuits, which are increased at the design of embedded processor systems with peripherals on modern FPGA programmable logic circuits, which are increased at the design of embedded processor systems with peripherals on modern FPGA programmable logic circuits, which are increased at the design of embedded processor systems with peripherals on modern FPGA programmable logic circuits, which are increased at the design of embedded processor systems with peripherals on modern FPGA programmable logic circuits, which are increased at the design of embedded processor systems with peripherals on modern FPGA programmable logic circuits, which are increased at the design of embedded processor systems with peripherals on modern FPGA programmable logic circuits, which are increased at the design of embedded processor systems with peripherals on modern FPGA programmable logic circuits, which are increased at the design of embedded processor systems with peripherals on modern FPGA programmable logic circuits, which are increased at the design of embedded peripherals on the design of embedded at the	singly widely used	today. Students			
using circuit simulation. Practical problems are solved using development boards used at hundreds of leading universities around the world. The course ends with RISC-V processor structure, cache, and pipeline processing.         BESDB13MVE       Materials for Power Electrical Engineering       Z,ZK       5         At first a physical description of basic properties and basic types of materials for electrical engineering, are presented. The stress is put on relationships between properties, technology and the use. The student will meet in higher detail, with caranics for electrical engineering, with properties of mica, glass and their applications, with environmental conductive joining, with materials for their and with selected nanomaterials and their applications.       Z,ZK       6         The basic formulations of the statistical decision problem are presented. The necessary knowledge about the (statistical) relationship between bervartations and classes of objects is acquired by learning on the raining set. The course covers both well-established and advanced classifier learning methods, as Perceptron, AdaBoost, Support Vector Machines, and 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 with a deeper and broader insight into the field of afficial intelliguene. More information is available at https://prg.ai/minor.         BE5B13EN1       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 elements and their parameters, steady, transine and failure phenomena, main rules for dimensioning and protecting.	will learn their description in VHDL, from logic to more complex sequential circuits to practical finite state machine (FSM) designs. They will also may	ster the correct de	sign procedure			
structure, cache, and pipeline processing.       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, 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.       Z,ZK       6         BESB33RPZ       Pattern Recognition and Machine Learning       Z,ZK       6         The basic formulations of the statistical decision problem are presented. The necessary knowledge about the (statistical) relationship between observations and classes of objects is acquired by learning on the raining set. The course covers both well-established and advanced classifier learning methods, as Perceptron, AdaBoost, Support Vector Machines, and Neural Nets. This course is also part of the inter-university programme prg.al Minor. It pools the best of Al education in Prague to provide students with a deeper and broader insight into the field of artificial intelligence. More information is available at https://prg.al/minor.         BESB1SEN1       Power Engineering 2       Z,ZK       5         The course informs students about basic principles and topologies of electrical transmission and distribution systems. There are explained key system elements and their parameters, steady, transient and failure phenomena, main rules for dimensioning and protecting.	using circuit simulation. Practical problems are solved using development boards used at hundreds of leading universities around the world. The cou	irse ends with RIS	C-V processor			
BE5B13MVE         Materials for Power Electrical Engineering         Z,ZK         5           At first a physical description of basic properties and basic types of materials to 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.         Z,ZK         6           BE5B31SPZ         Pattern Recognition and Machine Learning         Z,ZK         6           The basic formulations of the statistical decision problem are presented. The necessary knowledge about the (statistical) relationship between observations and classes of objects is acquired by learning on the raining set. The course covers both well-established and advanced classifier learning methods, as Perceptron, AdaBoost, Support Vector Machines, and Neural Nets. Thois course is a sis op ard of the inter-university programme prag. al Minor. It pools the best of AI education in Prague to provide students with a deeper and broader insight into the field of artificial intelligence. More information is available at https://prg.ai/minor.         5           BE5B31SEN1         Power Engineering 2         Z,ZK         6           This course is a baot basic principles and topologies of electrical transmission and distribution systems. There are explained key system elements and their parameters, steady, transient and Tailue phenomena, main rules tor dimensioning and protecting.         Z,ZK         6           This course is an intr	structure, cache, and pipeline processing.					
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 ceracial 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.  BESB33RPZ Pattern Recognition and Machine Learning C.Z,K 6 The basic formulations of the statistical decision problem are presented. The necessary knowledge about the (statistical) relationship between observations and classes of objects is acquired by learning on the raining set. The course covers both well-established and advanced classifier learning methods, as Perceptron, AdaBoost, Support Vector Machines, and 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 with a deeper and broader insight into the field of artificial intelligence. More information is available at https://prg.ai/minor. BESB15EN1 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 elements and their parameters, steady, transient and fullive phenomena, main rules for dimensioning and protecting. BESB15EN2 Power Engineering 2 Z,K 6 This course is an introduction to the field of thermodynamic processes in thermal power plants, energy balances and structure of various renewable and conventional energy production technologies. Students will became also familiar with individual components of self consumption of power plants. The power generation and distribution are linked to high voltage systems an instrudents for electr	BE5B13MVE Materials for Power Electrical Engineering	Z,ZK	5			
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.           BE5B33RPZ         Pattern Recognition and Machine Learning         Z,ZK         6           The basic formulations of the statistical decision problem are presented. The necessary knowledge about the (statistical) relationship between observations and classes of objects is acquired by learning on the raining set. The course covers both well-bestabilished and advanced classifier learning methods, as Perceptrin, AdaBooxt, Support Vector Machines, and 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 with a deeper and broader insight into the field of artificial intelligence. More information is available at https://prg.ai/minor.           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 elements and their parameters, steady, transient and failure phenomena, main rules for dimensioning and protecting.         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 and conventional energy production technologies. Students will became also familiar with individual components of self consumption of power	At first a physical description of basic properties and basic types of materials for electrical engineering is carried out. Types of conductors, supercon	ductors, insulators	, magnetic			
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.          BE5B33RPZ       Pattern Recognition and Machine Learning       Z,ZK       6         The basic formulations of the statistical decision problem are presented. The necessary knowledge about the (statistical) relationship between observations and classes of objects is acquired by learning on the raining set. The course covers both well-established and advanced classifier learning methods, as Perceptron, AdaBoost, Support Vector Machines, and 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 with a deeper and broader insight into the field of artificial intelligence. More information is available at https://prg.ai/minor.         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 elements and their parameters, steady, transient and failure phenomena, main rules for dimensioning and protecting.       Z,ZK       6         This course is all introduction to the field of thermodynamic processes in thermal power plants, energy balances and structure of various renewable and conventional energy production technologies. Students will be camerals. The fundamental theory of often used insulation materials. The fundamental theory of often used insulatorin materials. The fundamental theory of often used insulatorin materials. The fundamental theory of often used insulatorin materials. The fundamental th	materials and semiconductors, which are used in power electrical engineering, are presented. The stress is put on relationships between properties	, technology and t	ne use. The			
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Becreasing uncertainties.         BE5B31TES       Signal Theory       Z,ZK       5         Course explains basic terms and methods for representation and analysis of continuous-time and discrete-time signals and systems. Representations of signals and systems in continuous and discrete-time is developed for time and frequency domains through the Fourier transform. Bode and Nyquist plots as well as the Laplace transform and the Z-transform are used for stability analysis of feedback systems. Linearization by small-signal analysis is introduced. Filtering and filter design, sampling and interpolation are discussed. Analog and pulse modulation fundamentals and their characteristics are introduced. Characteristics of band-pass signals are discussed, including Hilbert transform and complex envelope. Fundamentals of random signals and their parameters are reviewed.	Basic circuits and instruments for measurement of electrical quantities, AD and DA converters, sensors focused to use in robotics and automation, i	ntelligent sensors,	methods of			
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Name of the block: Elective courses Minimal number of credits of the block: 0 The role of the block: V Code of the group: BEECSVOL Name of the group: Elective special subjects Requirement credits in the group: Requirement courses in the group: Credits in the group: 0 Note on the group: Note on the group: 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.\\

## List of courses of this pass:

Code	Name of the course	Completion	Credits		
BBAP20	Bachelor thesis	Z	20		
BE5B01DEN	Differential Equations&Numerical Methods	Z,ZK	7		
This course introdu	ces students to the classical theory of ordinary differential equations (separable and linear ODEs) and also to bsics of numerical meth	ods (errors in calc	ulations and		
stability, numerica	I solutions of algebraic and differential equations and their systems). The course takes advantage of the synnergy between theoretic	al and practical po	int of view.		
BE5B01DMG	Discrete Mathematics and Graphs	Z,ZK	5		
The aim of the	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 order	ngs; integers, relat	ion modulo;		
	algebraic structures including Boolean algebras. Further, the course covers basics of the Theory of Graphs.				
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, linear standard bilinear and supervision of supervision and super	r transformations)	including		
	eigenvalues and eigenvectors, mainx similarity, orthogonal bases, and blinear and quadratic forms are also covered.	7 71/	7		
BE5B01MA1		Z,ZK	/		
functions Thon it	ry 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	rapning of		
			II to Taylor		
BE5B01MA2		7 7K	7		
The subject covers	an introduction to the differential and integral calculus in several variables and basic relations between curve and surface integrals. For	rier series are also	introduced		
BE5B01DDS	Drobability and Statistics	7 7K	7		
DESDOTING	Introduction to the theory of probability mathematical statistics and computing methods together with their applications of pra	xis	,		
BE5B02PH1	Physics 1	7 7K	8		
The basic course o	f physics at the Faculty of Electrical Engineering - Physics 1 is devoted to the introduction into two important areas of physics. The first	z, z i classica	l mechanics		
and the second one	is the electric and magnetic field. Within the framework of the classical mechanics, the students study the particle kinematics; dynamic	cs of the mass part	icle, system		
of mass particles a	and 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 stud	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 framew	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		
hypes of waves, such	In as acoustic of optical waves are the subjects of the following section. Quantum mechanics and huclear physics will complete the s	d will allow them to			
physics. The knowle	the principles of novel technologies and functioning of new electronic devices		unuerstanu		
BE5B13MVE	Materials for Power Electrical Engineering	7 7K	5		
At first a physica	I description of basic properties and basic types of materials for electrical engineering is carried out. Types of conductors, supercond	uctors, insulators.	magnetic		
materials and se	miconductors, which are used in power electrical engineering, are presented. The stress is put on relationships between properties, t	echnology 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 con	ductive joining, wit	h materials		
	for thin and thick films and with selected nanomaterials and their applications.				
BE5B14SP1	Electric Machinery and Apparatus 1	Z,ZK	5		
Electric drive and it	s components. Electromechanical energy conversion. Rotational converters - DC machines, induction motors, synchronous generato	rs and motors. Spe	ecial electric		
machines, actuat	ors. Static converters - transformers. There are presented operational principles, main constructional scheme and characteristics, ap	plications. Switchin	ng theory.		
Interaction betw	een turn-off switch and switched circuit. Basic theory and characteristic of electric arc. Transient recovery voltage. Switching overvolt	age. Low voltage p	rotection		
	apparatuses		-		
BE5B15EN1	Power Engineering 1	Z,ZK	5		
i ne course informs	students about basic principles and topologies of electrical transmission and distribution systems. There are explained key system e	iements and their	parameters,		
	steady, transient and failure prenomena, main rules for dimensioning and protecting.	7 71/	6		
	FUWEL ETIGINEETING Z	∠,∠N			
technologies St	incurrent to the new of thermoughamic processes in thermal power plants, energy balances and structure of various renewable and distribution of nower plants. The nower generation and distribution of nower plants. The nower generation and distribution of nower plants.	onventional energy	h voltage		
systems and insulation materials. The fundamental theory of often used insulation materials and their properties will be evolving 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
The aim of the cou	irse is to obtain knowledge about mathematic programs used in electrical engineering. Student will acquire basic knowledge about M	ATLAB, MATHEMA	TICA and
	mathematical model assessment.		
BE5B16EPD	Business Economics	KZ	4
Targets and fund	ction of business, corporation life cycle. Cost classification, cost calculation, cost curves. Profit, production, price and cost relation. Tax	xes. Financial calcu	lus and
	investment decision-making. Business plan. Management functions, corporation organizational schemes. Processes and firm mana	agement.	
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 view on studied effects, which is applied then	on engineering pr	oblems. 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, systems	s and techniques is	provided,
DECDOTEO	applicable not only to systems currently taught in other courses, but to future systems as well.	7 71/	
BE5B31TES	Signal Theory	Z,ZK	5
Course explains	basic terms and methods for representation and analysis of continuous-time and discrete-time signals and systems. Representations	s of signals and sys	stems in 7. transform
are used for stabil	the solution is developed for time and requercy domains through the Fourier transform. Bode and hydrist plots as well as the Laplace	lation are discusse	d Applog
and pulse modula	tion fundamentals and their characteristics are introduced. Characteristics of band-pass signals are discussed, including Hilbert trans	form and complex	envelope
	Fundamentals of random signals and their parameters are reviewed.		onrolopoi
BE5B317EO	Eundamentals of Electrical Circuits	7 7K	5
The subject describ	bes fundamental methods of electrical circuit analysis. After a brief introductory part where the difference between an electrical device	and its models is	introduced.
the basic ideal pas	sive and active circuit elements are then defined. Next, basic circuit quantities are defined; lectures are then focused on important lav	vs and methods of	analysis of
electrical circuits. C	ircuit theorems, an analysis of DC circuits, AC circuits, first-order and second-order circuits are described. Finally, a brief description of	of more sophisticate	ed methods
of analysis (Laplac	e transform, pulse excitation) is done. The seminars are focused on getting a theoretical experience in analysis of electrical circuits, s	upplemented with s	simulations
	and simple measurement.		
BE5B32PKS	Computer and Communication Networks	Z,ZK	6
The aim of the cou	rse is to familiarize students with current trends in the switched local networks and the key functions of routing protocols in IP network	ks. The course is ai	med rather
	primarily practically then theoretically.		
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 Pyth	non. Basic
data types a data s	tructures, basic algorithms, recursive functions, abstract data types, stack, queues, trees, searching, sorting, special application algor	ithms, Dynamic pro	gramming.
	Students are able to design and construct non-trivial algorithms and to evaluate their affectivity.		
BE5B33KUI	Cybernetics and Artificial Intelligence	Z,ZK	6
The course introdu	aces the students into the field of artificial intelligence and gives the necessary basis for designing machine control algorithms. It adva	ances the knowledg	ge of state
space search algo	ithms by including uncertainty in state transition. Students are introduced into reinforcement learning for solving problems when the s	tate transitions are	unknown,
which also connec	is the artificial intelligence and cybernetics fields. Bayesian decision task introduces supervised learning. Learning from data is demo	nstrated on a linea	r classifier.
DEEDOODO	Students practice the algorithms in computer habs.	7 71/	6
DE3D33FKG	$\Gamma$ FIOURITITIITY ESSETTIALS	∠,∠∩ mming patterns Th	0 emphasis
	is on creating readable and reusable programs	inning patterns. The	e empriasis
BE5B33BP7	Pattern Recognition and Machine Learning	7 7K	6
The basic formulat	ions of the statistical decision problem are presented. The necessary knowledge about the (statistical) relationship between observat	ions and classes of	f objects is
acquired by learning	n on the raining set. The course covers both well-established and advanced classifier learning methods. as Perceptron. AdaBoost. S	Support Vector Mac	hines. and
Neural Nets. This	sourse is also part of the inter-university programme prg ai Minor. It pools the best of AI education in Prague to provide students with	a deeper and broa	der insight
	into the field of artificial intelligence. More information is available at https://prg.ai/minor.	·	0
BE5B34ELP	Electron Devices	Z,ZK	5
This course introdu	ces the basic theory, principles of operation and properties of electron devices. Physical principles of operation, device structures and	d characteristics are	e explained
together with adequ	Jate models for small- and large-signal. Basic applications in analogue and digital electronics are examined. In seminars and labs, stu	dents are introduc	ed to basic
principles of device	simulation, measurement of device characteristics and extraction of device parameters. Operation of electron devices in electronic d	evices is then anal	yzed using
	the Spice simulator.		
BE5B34MIK	Microcontrollers	Z,ZK	6
The goal of this co	surse is to make students acquainted with recent interesting applications, smart sensors circuits and peripherals handled by microcor	trollers. In a lab stu	udents will
program their	own application and measure its properties. Because of usage of a programming language C it will be possible to focus on the practic	al part of the realiz	zation.
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 presented	1 in the previous le	ctures of
Structures of comp	uter systems. Topics cover building blocks description, CPU structure, multiple processors interconnections, input/output subsystem a	and basic overview	of network
and buses topolog	les. Emphasis is placed on clarification of interconnection of naroware components with software support, mainly lower levels of oper	ating systems, dev	ice drivers
and virtualization	software view to the contrary. Students are load from bacic programming on CPI Llevel to the interaction with raw backware	es are more locuse	ed on the
		77K	7
Eoundation cours	AUTION AUTION AUTION A PART AND A PART A PART A PART A P	∠,∠r∖   sics_robotics and ir	<i>I</i> formatics
nature Basic prin	ciples of feedback and its use as a tool for altering the behavior of systems and managing uncertainty Classical and modern method	Is for analysis and	design of
automatic control	systems. Students specialized in systems and control will build on these ideas and knowledge in the advanced courses to follow. Stu	dents of other bran	ches and
	programs will find out that control is a inspiring, ubiquitous and entertaining field worth of a future cooperation.		
BE5B35LSP	Logic Systems and Processors	Z,ZK	6
The course introdu	ces the basic hardware structures of computing resources, their design, and architecture. It provides an overview of the possibilities	of performing data	operations
at the hardware leve	el and the design of embedded processor systems with peripherals on modern FPGA programmable logic circuits, which are increasing	ly widely used toda	y. Students
will learn their des	cription in VHDL, from logic to more complex sequential circuits to practical finite state machine (FSM) designs. They will also master	the correct design	procedure
using circuit simula	ation. Practical problems are solved using development boards used at hundreds of leading universities around the world. The course	ends with RISC-V	processor
	structure, cache, and pipeline processing.		
BE5B38SME	Sensors and Measurement	Z,ZK	6
Basic circuits and	I instruments for measurement of electrical quantities, AD and DA converters, sensors focused to use in robotics and automation, inter-	elligent sensors, me	ethods of
	decreasing uncertainties.		

BE5B99CPL	C Programming Language	Z,ZK	6			
The course provide	The course provides 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	ebugging.			
Lectures introduce	basic code structures and demonstration applications which link together partial constructs and practical coding aiming for cleanline:	ss and structure of	the source			
code, computationa	al efficiency optimized using code profiling and debugging. Students are introduced into the fundamental principles of parallel multi-thread	programming, syn	chronization			
m	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			
An individual stud	ent project. The student works on a topic of his or her interest under supervision of a faculty staff member. The topic selection is supp	osed to be consult	ed with the			
tutor. Aside the in	dividual work and consultancies the project course is accompanied by lectures and practical seminars about economic aspects of pro	ojects, presentation	n skills and			
	technical writing.					
BEEZB	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	n of it. This introduc	ctory course			
contains fund	amentals of Safety Electrical Engineering. In this way the students receive qualification of instructed person that enables them to work	c on electrical equi	pment.			
BEEZZ	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.						

For updated information see <u>http://bilakniha.cvut.cz/en/FF.html</u> Generated: day 2025-08-01, time 07:23.