Study plan

Name of study plan: Open Informatics - Artificial Intelligence and Computer Science 2018

Faculty/Institute/Others: Faculty of Electrical Engineering

Department:

Branch of study guaranteed by the department: Welcome page

Garantor of the study branch:

Program of study: Open Informatics Type of study: Bachelor full-time

Required credits: 152
Elective courses credits: 28
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: 2018_BOIBAP Name of the group: Bachelor Project

Requirement credits in the group: In this group you have to gain 20 credits Requirement courses in the group: In this group you have to complete 1 course

Credits in the group: 20 Note on the group:

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 meila Roman meila (Gar.)	Z	20	12S	L,Z	Р

Characteristics of the courses of this group of Study Plan: Code=2018_BOIBAP Name=Bachelor Project

BBAP20 Bachelor thesis	Z	20
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Code of the group: 2018_BOIBBE

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

Requirement credits in the group:

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

Credits in the group: 0 Note on the group:

BF7B

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
BEZB	Safety in Electrical Engineering for a bachelor's degree Ivana Nová, Radek Havlí ek, Vladimír K la Radek Havlí ek Vladimír K la (Gar.)	Z	0	2BP+2BC	Z,L	Р
BEZZ	Basic health and occupational safety regulations Ivana Nová, Radek Havlí ek, Vladimír K la Radek Havlí ek Vladimír K la (Gar.)	Z	0	2BP+2BC	Z	Р

Characteristics of the courses of this group of Study Plan: Code=2018_BOIBBE Name=Safety of the bachelor's studies

Safety in Electrical Engineering for a bachelor's degree

000	Calcity in Electrical Engineering for a bachloler o degree	, - ,	. •		
The purpose of the safety course is to give the students basic knowledge of electrical equipment and installation as to avoid danger arising from operation of it. This introductory course					
contains fundamentals of Safety Electrical Engineering. In this way the students receive qualification of instructed person that enables them to work on electrical equipment.					
BEZZ	Basic health and occupational safety regulations	Z	0		

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

Code of the group: 2018_BOIP

Name of the group: Compulsory subjects 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 17 courses

Credits in the group: 102

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
B4B33ALG	Algorithms Marko Genyk-Berezovskyj, Daniel Pr ša Marko Genyk-Berezovskyj Marko Genyk-Berezovskyj (Gar.)	Z,ZK	6	2P+2C	Z	Р
B0B35APO	Computer Architectures Pavel Píša, Richard Šusta, Petr Št pán Pavel Píša Pavel Píša (Gar.)	Z,ZK	5	2P+2L	L	Р
B0B36DBS	Database Systems Martin imná Martin imná Martin imná (Gar.)	Z,ZK	6	2P+2C+4C	L	Р
B4B01DMA	Discrete Mathematics Petr Habala Petr Habala (Gar.)	Z,ZK	5	2P+2S	Z	Р
B0B01LAG	Linear Algebra Ji í Velebil, Natalie Žukovec, Daniel Gromada, Josef Dvo ák, Mat j Dostál Ji í Velebil Ji í Velebil (Gar.)	Z,ZK	8	4P+2S	Z	Р
B0B01LGR	Logic anad Graphs Natalie Žukovec, Mat j Dostál, Alena Gollová Alena Gollová Marie Demlová (Gar.)	Z,ZK	5	3P+2S	Z,L	Р
B0B01MA1	Mathematical Analysis 1 Josef Dvo ák, Martin K epela, Josef Tkadlec, Veronika Sobotíková Josef Tkadlec Josef Tkadlec (Gar.)	Z,ZK	7	4P+2S	Z,L	Р
B0B01MA2	Mathematical Analysis 2 Karel Pospíšil, Miroslav Korbelá, Petr Hájek, Martin Bohata, Jaroslav Tišer, Paola Vivi, Hana Tur inová Petr Hájek Jaroslav Tišer (Gar.)	Z,ZK	7	4P+2S	L,Z	Р
B4B35OSY	Operating Systems Petr Št pán, Michal Sojka Michal Sojka (Gar.)	Z,ZK	4	2P+2C	Z	Р
B0B33OPT	Optimization Tomáš Werner, Petr Olšák, Mirko Navara, Tomáš Kroupa Tomáš Werner Tomáš Werner (Gar.)	Z,ZK	7	4P+2C	Z,L	Р
B4B36PDV	Parallel and Distributed Computing Jakub Mare ek, Michal Jakob, Daria Mikhaylovskaya Michal Jakob Michal Jakob (Gar.)	Z,ZK	6	2P+2C	L	Р
B4B38PSIA	Computer Networks Ji í Novák, Jan Holub Ji í Novák Ji í Novák (Gar.)	Z,ZK	5	2P+2L	L	Р
B0B01PST	Probability and Statistics Miroslav Korbelá, Veronika Sobotíková, Kate ina Helisová, Matvei Slavenko Kate ina Helisová Petr Hájek (Gar.)	Z,ZK	7	4P+2S	Z	Р
B0B36PRP	Procedural Programming Jan Faigl Jan Faigl (Gar.)	Z,ZK	6	2P+2C	Z	Р
B0B36PJV	Programming in Java Ji í Vok ínek, Martin Mudroch, Ladislav Serédi Ji í Vok ínek Ji í Vok ínek (Gar.)	Z,ZK	6	2P+3C+7C	L	Р
B4B33RPH	Solving Problems and other Games Tomáš Svoboda, Petr Pošík Petr Pošík Tomáš Svoboda (Gar.)	KZ	6	2P+3C	Z	Р
B4BPROJ6	Unassisted project Tomáš Svoboda, Petr Pošík, Ji í Šebek, Jaroslav Sloup, Ivan Jelínek, Katarína Žmolíková Petr Pošík	Z	6	0+2	Z,L	Р

B4B33ALG	If the courses of this group of Study Plan: Code=2018_BOIP Name=Compulsory subjects of Algorithms	Z,ZK	6	
In the course, the algo	rithms development is constructed with minimum dependency to programming language; nevertheless the lectures and semin	ars are based on	Java. Basic data	
types a data structure	s, basic algorithms, recursive functions, abstract data types, stack, queues, trees, searching, sorting, special application algori	thms, Dynamic pr	rogramming.	
Students are able to o	esign and construct non-trivial algorithms and to evaluate their effectivity.			
B0B35APO	Computer Architectures	Z,ZK	5	
B0B36DBS	Database Systems	Z,ZK	6	
The course is designed	d as a basic database course mainly aimed at the student ability to design a relational data model and to use the SQL language	ge for data definit	ion as well as for	
data querying and to	choose the appropriate degree of transaction isolation. Students will also get acquainted with the most commonly used indexin	g techniques, dat	abase system	
architecture and their	management. They will verify their knowledge during the elaboration of a continuously submitted seminar task.			
B4B01DMA	Discrete Mathematics	Z,ZK	5	
In this course students meet some important topics from the field of discrete mathematics. Namely, they will explore divisibility and calculations modulo n, diophantine equations, binary				
relations, mappings, cardinality of sets, induction, and recurrence equations. The second aim of this course is to teach students the language of mathematics, both passively and				
actively, and introduce	them to mathematics as science.			
B0B01LAG	Linear Algebra	Z.ZK	8	

The course covers the initial parts of linear algebra. Firstly, the basic notions of a linear space and linear mappings are covered (linear dependence and independence, basis, coordinates, etc). The calculus of matrices (determinants, inverse matrices, matrices of a linear map, eigenvalues and eigenvectors, diagonalisation, etc) is covered next. The applications include

solving systems of linear equations, the geometry of a 3D space (including the scalar product and the vector product) and SVD.

B0B01LGR	Logic anad Graphs	Z,ZK	5
This course covers be	isics of mathematical logic and graph theory. Syntax and semantics of propositional and predicate logic are introduced. The impo	rtance of the notion	of consequence
and of the relationsh	p between a formula and its model is stressed. Further, basic notions from graph theory are introduced.		
B0B01MA1	Mathematical Analysis 1	Z,ZK	7
The aim of the cours	e is to introduce students to basics of differential and integral calculus of functions of one variable.		
B0B01MA2	Mathematical Analysis 2	Z,ZK	7
The subject covers a	n introduction to the differential and integral calculus in several variables and basic relations between curve and surface integ	rals. Other part conta	ains function
series and power ser	ies with application to Taylor and Fourier series.		
B4B35OSY	Operating Systems	Z,ZK	4
Lecture introduces o	peration system's basic concepts and principles as processes, threads, communication and synchronization, virtual memory,	drivers, file systems,	, basic security
	are theoretically described and demonstrated on Linux and Windows OS with multi-core systems. Practical exercises from C	S in C programmino	g language will
be solved on labs. St	udents will work with Linux OS and micro-kernel NOVA.		
B0B33OPT	Optimization	Z,ZK	7
The course provides	an introduction to mathematical optimization, specifically to optimization in real vector spaces of finite dimension. The theory is ill	ustrated with a numb	per of examples.
You will refresh and	xtend many topics that you know from linear algebra and calculus courses.		
B4B36PDV	Parallel and Distributed Computing	Z,ZK	6
B4B38PSIA	Computer Networks	Z,ZK	5
B0B01PST	Probability and Statistics	Z,ZK	7
B0B36PRP	Procedural Programming	Z,ZK	6
The course accompa	nies basic programming emphasizing the data representation in computer memory. Furthermore, the concepts of linked data st	ructures and proces	sing user inputs
are developed. Stude	nts master the practical implementation of simple individual tasks. The course emphasizes acquiring programming habits for	creating readable an	nd reusable
programs. At the sam	e time, the effort is to build students an overview of the program operation, data model, memory access, and management. The	refore, the C program	nming language
•	a direct link between the program data structures and their representation in the computer memory. Students will get acquainte		•
•	ith debugging and profiling. Labs aim to acquire practical skills of implementing simple individual tasks, emphasizing functiona		•
•	e is developed by a set of homework with the possibility of optional and bonus assignments. The final task is an integration of		sing existing
	luation of coding style motivated by writing legible, understandable, and maintainable codes is also a part of the selected task		
B0B36PJV	Programming in Java	Z,ZK	6
	the basics of algorithms and programming from the first semester and introduces students to the Java environment. The cou		
	The topics of the course includes exceptions, event handling, and building a graphical interface. Basic library methods, working	•	
	important topic is models of multithreaded applications and their implementation. Practical exercises of practical skills and known and their implementation.	•	
٠.	s and semester work, which will be submitted continuously through the source code version control system. The semester wo	ork scoring consists	of points for the
	ency of the code, as well as points that take into account the quality of the source codes, their readability and reusability.		
B4B33RPH	Solving Problems and other Games	KZ	6
	is to let students to deal with real-world problems properly. When working on real problems the student shall learn how to dec		
	v to test and validate individual steps and so on. Many problems will actually be beyond the first-year-student skills. And many	•	
	olved parts should motivate the students to study difficult theoretical subjects. They should generate the important questions.	•	• •
	e eager to study deeper about informatics. The course also explains the basis of the object oriented design, software testing, v	ways for writing read	able and robus
codes.			

Code of the group: 2015_BZAJ

Name of the group: Exam from the english language

Unassisted project

Requirement credits in the group:

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

Credits in the group: 0 Note on the group:

B4BPROJ6

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
B0B04B1K	English language B1 - classified assessment Markéta Havlí ková, Pavla Péterová, Erik Peter Stadnik, Michael Ynsua, Dana Saláková, Petra Juna Jennings Petra Juna Jennings (Gar.)	KZ	0	0C	Z,L	Р
B0B04B2Z	English language B2 - exam Michael Ynsua, Dana Saláková, Petra Juna Jennings Petra Juna Jennings Petra Juna Jennings	Z,ZK	0	0C	Z,L	Р

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

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

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

Name of the block: Povinné p edm ty zam ení

Minimal number of credits of the block: 30

The role of the block: PZ

Code of the group: 2018_BOIPS1

Name of the group: Compulsory subjects of the branch

Requirement credits in the group: In this group you have to gain 30 credits

Requirement courses in the group: In this group you have to complete 5 courses

Credits in the group: 30

Note on the group:

Specializace - základy umělé inteligence a počítačových věd

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
B4B36FUP	Functional Programming Rostislav Hor fk, Niklas Maximilian Heim Michal P chou ek Michal P chou ek (Gar.)	Z,ZK	6	2P+2C	L	PZ
B4B01JAG	Languages, Automats and Gramatics Marie Demlová, Ji í Demel Marie Demlová Marie Demlová (Gar.)	Z,ZK	6	2P+2S	Z	PZ
B4B01NUM	Numerical Analysis Mirko Navara, Aleš N me ek Mirko Navara Mirko Navara (Gar.)	Z,ZK	6	2P+2C	Z	PZ
B4B33RPZ	Recognition and machine learning Ond ej Drbohlav, Ji í Matas, Jan Šochman Ond ej Drbohlav Ji í Matas (Gar.)	Z,ZK	6	2P+2C	Z	PZ
B4B36ZUI	Introduction to Artificial Intelligence Viliam Lisý, Branislav Bošanský Branislav Bošanský Michal P chou ek (Gar.)	Z,ZK	6	2P+2C	L	PZ

Characteristics of the courses of this group of Study Plan: Code=2018 BOIPS1 Name=Compulsory subjects of the branch

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B4B36FUP	Functional Programming	Z,ZK	

This course introduces students into the techniques of functional programming, the advantages and disadvantages of this programming paradigm, and its use in practice. This approach is declarative in the sense that the programmer symbolically describes the problem to be solved, rather than specifying the exact sequence of operations required to solve it. It allows focusing on the essence of the solved problem and implementing even more complex algorithms compactly. Functional programming has notable advantages for parallelization and automated verification of algorithms, and the most useful functional programming concepts are increasingly often introduced to standard programming languages. Because of the focus of functional programming on symbols, rather than numbers, functional programming has been heavily used in in artificial intelligence fields, such as agent systems or symbolic machine learning. 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.

B4B01JAG	Languages, Automats and Gramatics
D4D01JAG	Lanuuaues. Automais anu Giamailes

Z,ZK | 6

Basic notions of the theory of finite automata and grammars: deterministic and non deterministic finite automata, languages accepted by finite automata, regular expressions. Grammars and languages generated by grammars with emphasis to context free grammars. A very brief introduction of Turing machines.

B4B01NUM Numerical Analysis

Z,ZK 6

The course introduces to basic numerical methods of interpolation and approximation of functions, numerical differentiation and integration, solution of transcendent equations and systems of linear equations. Emphasis is put on estimation of errors, practical skills with the methods and demonstration of their properties using Maple and computer graphics.

B4B33RPZ Recognition and machine learning

7 7K

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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 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.ai/minor.

B4B36ZUI Introduction to Artificial Intelligence

Z,ZK

6

The aim of the course is to cover the basics of symbolic artificial intelligence. We will focus on algorithms of informed and uninformed state space search, problem representation and solving, representation of knowledge using formal logic, methods of automated reasoning, and an introduction to Markov decision making, and to two-player games. 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 artificial intelligence. More information is available at https://prg.ai/minor.

Name of the block: Compulsory elective courses

Minimal number of credits of the block: 0

The role of the block: PV

Code of the group: 2018_BOIAPP

Name of the group: Subjects in english

Requirement credits in the group:

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

Credits in the group: 0

Note on the

group:

~Studenti programu Otevřená informatika musí v bakalářském studiu projít alespoň jedním anglicky přednášeným

povinným předmětem programu či oboru. Bližší podmínky jsou uvedeny na stránce

https://oi.fel.cvut.cz/cs/bakalarsky-program (sekce Jazyková příprava). Níže je uveden seznam doporučených

předmětů, kterými můžete tuto povinnost splnit. Pokud je česká varianta součástí vašeho povinného studijního plánu, pochopitelně vam anglická varianta nahradí tuto českou. Kromě uvedeného seznamu lze povinnost splnit zápisem anglicky přednášeného předmětu na zahraniční stáži (Erasmus, apod.). V obou výše uvedených případech bude povinnost v KOSu splněna automaticky. Poslední možností je splnit tuto povinnost na žádost jinak (předmět mimo seznam, bakalářská práce vedená zahraničním vedoucím, apod.).\\

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
BE4B33SEA	Subject in english - abroad	Z,ZK	0		Z,L	PV
BE5B32PKS	Computer and Communication Networks Leoš Bohá , Tomáš Van k, Pavel Bezpalec Zbyn k Kocur Leoš Bohá (Gar.)	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
BE4B38PSIA	Computer Networks Jií Novák, Jan Holub Jií Novák Jií Novák (Gar.)	Z,ZK	5	2P+2L	L	PV
BE4B36FUP	Functional Programming Rostislav Hor ík, Niklas Maximilian Heim Rostislav Hor ík Michal P chou ek (Gar.)	Z,ZK	6	2P+2C	L	PV
BE4B36ZUI	Introduction to Artificial Intelligence Viliam Lisý, Branislav Bošanský Branislav Bošanský (Gar.)	Z,ZK	6	2P+2C	L	PV
BE5B35LSP	Logic Systems and Processors Richard Šusta, Martin Hlinovský Martin Hlinovský Richard Šusta (Gar.)	Z,ZK	6	3P+2L	Z	PV
BE5B33RPZ	Pattern Recognition and Machine Learning Ond ej Drbohlav, Ji í Matas, Jan Šochman Ji í Matas Ji í Matas (Gar.)	Z,ZK	6	2P+2C	Z	PV
BE4B39VGO	Creating graphic content Ladislav molík Ladislav molík (Gar.)	Z,ZK	6	2P+2C+8D	Z	PV

Characteristics of the courses of this group of Study Plan: Code=2018_BOIAPP Name=Subjects in english

BE4B33SEA	Subject in english - abroad	Z,ZK	0
The subject serves for	validation of the duty to complete at least one compulsory course of the program in English.		

BE5B32PKS Computer and Communication Networks 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 networks. The course is aimed rather primarily practically then theoretically.

Z,ZK

Z,ZK

Z.ZK

Z,ZK

Z.ZK

6

BE5B35APO Computer Architectures

Subject provides overview of basic building blocks of computer systems. Explanation starts from hardware side where it extends knowledge presented in the previous lectures of Structures of computer systems. Topics cover building blocks description, CPU structure, multiple processors interconnections, input/output subsystem and basic overview of network and buses topologies. Emphasis is placed on clarification of interconnection of hardware components with software support, mainly lower levels of operating systems, device drivers and virtualization techniques. General principles are more elaborated during presentation of examples of multiple standard CPU architectures. Exercises are more focused on the software view to the contrary. Students are lead from basic programming on CPU level to the interaction with raw hardware.

BE4B38PSIA Computer Networks

Z,ZK Subject is devoted to principles and technologies of Computer Networks. Physical layer media, analog and digital modulations, network topologies, MAC methods, ARQ algorithms, data communication models, coding and cryptography basics are introduced. Widely used LAN technologies are then presented together with their features. Internet protocols are explained and internetworking approaches are presented.

BE4B36FUP **Functional Programming**

This course introduces students into the techniques of functional programming, the advantages and disadvantages of this programming paradigm, and its use in practice. This approach is declarative in the sense that the programmer symbolically describes the problem to be solved, rather than specifying the exact sequence of operations required to solve it. It allows focusing on the essence of the solved problem and implementing even more complex algorithms compactly. Functional programming has notable advantages for parallelization and automated verification of algorithms, and the most useful functional programming concepts are increasingly often introduced to standard programming languages. Because of the focus of functional programming on symbols, rather than numbers, functional programming has been heavily used in in artificial intelligence fields, such as agent systems or symbolic machine learning. 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.

Introduction to Artificial Intelligence

The aim of the course is to cover the basics of symbolic artificial intelligence. We will focus on algorithms of informed and uninformed state space search, problem representation and solving, representation of knowledge using formal logic, methods of automated reasoning, and an introduction to Markov decision making, and to two-player games. 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.

BE5B35LSP 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 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.

BE5B33RPZ Pattern Recognition and Machine Learning

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.

Creating graphic content BE4B39VGO

The aim of this course is to provide theory behind geometric modeling and modeling of materials, give students an overview of methods used in the process of creating 2D and 3D graphics and how to apply those methods in praxis. At the seminars, students will learn how to design and create three-dimensional scene, create and apply textures imitating materials (e.g., wall finishes, wood, sky) and geometrical details, and position and set-up lights in the scene.

Name of the block: Elective courses Minimal number of credits of the block: 0

The role of the block: V

Code of the group: 2018_BOIH

Name of the group: Humanities subjects

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

Credits in the group: 0 Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
B0B16ET1	Ethic 1 Vladimír Sláme ka Vladimír Sláme ka Vladimír Sláme ka (Gar.)	KZ	4	2P+2C	Z	V
B0B16FIL	Philosophy Peter Zamarovský Peter Zamarovský (Gar.)	ZK	2	2P+0S	Z,L	V
B0B16FI1	Philosophy 1 Peter Zamarovský Peter Zamarovský (Gar.)	KZ	4	2P+2S	Z	V
B0B16HTE	History of technology and economic Marcela Efmertová, Jan Mikeš Marcela Efmertová (Gar.)	ZK	2	2P+0S	Z,L	V
B0B16HT1	History of science and technology 1 Marcela Efmertová, Jan Mikeš Marcela Efmertová (Gar.)	KZ	4	2P+2S	Z	V
B0B16HI1	History 1 Milena Josefovi ová Milena Josefovi ová Milena Josefovi ová (Gar.)	KZ	4	2P+2S	Z	V
B0B16MPS	Psychology Jan Fiala Jan Fiala (Gar.)	Z,ZK	4	2P+2S	Z,L	V
B0B16MPL	Psychology for managers Jan Fiala Jan Fiala Jan Fiala (Gar.)	ZK	2	2P+0S	Z,L	V

Characteristics of the courses of this group of Study Plan: Code=2018_BOIH Name=Humanities subjects

B0B16ET1	Ethic 1	KZ	4			
Aim of this subject is to provide the students an orientation not only in general problems of ethics but above all to offer instructions for solving various situations of human life. Essentia						
parts of the subject are discussions in which students can react to lectures but also to actual questions coming with news and look for the communal answers.						
B0B16FIL	Philosophy	ZK	2			
We deal with the most	important persons, schools and ideas of ancient philosophy. We are concerned especially on transdisciplinary nature of philos	sophy and connec	ction of old			
philosophical thoughts	with recent problems of science, technology, economics and politics.					
B0B16FI1	Philosophy 1	KZ	4			
We deal with the most	important persons, schools and ideas of ancient philosophy. We are concerned especially on transdisciplinary nature of philos	sophy and connec	ction of old			
philosophical thoughts	with recent problems of science, technology, economics and politics.					
B0B16HTE	History of technology and economic	ZK	2			
B0B16HT1	History of science and technology 1	KZ	4			
B0B16HI1	History 1	KZ	4			
B0B16MPS	Psychology	Z,ZK	4			
B0B16MPL	Psychology for managers	ZK	2			

Code of the group: 2015_BJKA

Name of the group: English language courses

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

Credits in the group: 0 Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
B0B04A21	English Language A2-1 Dana Saláková	Z		2s	Z	V
B0B04A22	English Language A2-2 Dana Saláková	Z	0	2s	L	V
B0B04B11	English Language B1-1 Petra Juna Jennings Petra Juna Jennings (Gar.)	Z	0	2C	Z	V
B0B04B12	English Language B1-2 Petra Juna Jennings Petra Juna Jennings (Gar.)	Z	0	2C	L	V

B0B04B21	English Language B2-1 Petra Juna Jennings Petra Juna Jennings (Gar.)	Z	3	2C	Z	V
B0B04B22	English Language B2-2 Petra Juna Jennings Petra Juna Jennings (Gar.)	Z	3	2C	Z,L	V

B0B04A21	English Language A2-1	Z	
	to students who are beginners in their second language. Course objective: Achieving competence in basic English.	_	1
B0B04A22	English Language A2-2	Z	0
The course is open	to students who are beginners in their second foreign language. The course objective is to develop and sustain their basic kno	wledge of the Eng	ish language.
B0B04B11	English Language B1-1	Z	0
Course objective: B	roadening the basic knowledge of general English; mastering basic specialised language; focusing on text analysis and vocabula	ry expansion; unde	rstanding spoke
English.			
B0B04B12	English Language B1-2	Z	0
Course objective: B	roadening the basic knowledge of general English; mastering basic specialised language; focusing on text analysis and vocabula	ry expansion; unde	rstanding spoke
English.			
English. B0B04B21	English Language B2-1	Z	3
B0B04B21		Z	3
B0B04B21 This course is design	English Language B2-1	Z k B2 - zkouška - B	3 0B04B2Z*). Whil
B0B04B21 This course is design the course is focused	English Language B2-1 [pned as a full-year, two semester preparation course for the university's compulsory B2-level English Examination (Anglický jazy	Z k B2 - zkouška - B ark), it also focuses	3 0B04B2Z*). Whiles more on the
B0B04B21 This course is design the course is focused	English Language B2-1 Ined as a full-year, two semester preparation course for the university's compulsory B2-level English Examination (Anglický jazy et on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher maical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an app	Z k B2 - zkouška - B ark), it also focuses	3 0B04B2Z*). Whiles more on the
B0B04B21 This course is designate the course is focused academic and technical models.	English Language B2-1 Ined as a full-year, two semester preparation course for the university's compulsory B2-level English Examination (Anglický jazy et on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher maical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an app	Z k B2 - zkouška - B ark), it also focuses	3 0B04B2Z*). Whiles more on the
B0B04B21 This course is design the course is focused academic and techn / International Study B0B04B22	English Language B2-1 Ined as a full-year, two semester preparation course for the university's compulsory B2-level English Examination (Anglický jazy and on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher manical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an app	Z k B2 - zkouška - Bark), it also focuses ropriate level of En	3 DB04B2Z*). Whill is more on the glish for Erasmu
B0B04B21 This course is design the course is focused academic and technology / International Study B0B04B22 This course is design.	English Language B2-1 Ined as a full-year, two semester preparation course for the university's compulsory B2-level English Examination (Anglický jazy and on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher manical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an apply. English Language B2-2	Z k B2 - zkouška - Bark), it also focuses ropriate level of En	3 DB04B2Z*). While some on the glish for Erasmu 3 BB04B2Z*). While
B0B04B21 This course is design the course is focuse academic and technology / International Study B0B04B22 This course is design the course is focused in the course in the course is focused in the course in the course in the course is focused in the course in the cour	English Language B2-1 Ined as a full-year, two semester preparation course for the university's compulsory B2-level English Examination (Anglický jazy and on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher manical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an apply. English Language B2-2 Ined as a full-year, two semester preparation course for the university's compulsory B2-level English Examination (Anglický jazy)	Z k B2 - zkouška - Bark), it also focuses ropriate level of En Z k B2 - zkouška - B0ark), it also focuses	3 DB04B2Z*). While is more on the glish for Erasmu 3 DB04B2Z*). While is more on the

Code of the group: BTV

Name of the group: Physical education

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

Credits in the group: 0 Note on the group:

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

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

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

Code of the group: BTVK

Name of the group: Physical education courses

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

Credits in the group: 0 Note on the group:

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

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

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

Code of the group: 2018_BOIVOL Name of the group: Elective subjects Requirement credits in the group: Requirement courses in the group:

Credits in the group: 0

Note on the group:

~Nabídku volitelných předmětů uspořádaných podle kateder najdete na webových stránkách http://www.fel.cvut.cz/cz/education/volitelne-predmety.html\\

List of courses of this pass:

Code	Name of the course	Completion	Credits
A003TV	Physical Education	Z	2
B0B01LAG	Linear Algebra	Z,ZK	8
The course covers	the initial parts of linear algebra. Firstly, the basic notions of a linear space and linear mappings are covered (linear dependence and ind	ependence, basis,	coordinates,
etc). The calculus	of matrices (determinants, inverse matrices, matrices of a linear map, eigenvalues and eigenvectors, diagonalisation, etc) is covered	next. The applicati	ons include
	solving systems of linear equations, the geometry of a 3D space (including the scalar product and the vector product) and S	1	
B0B01LGR	Logic anad Graphs	Z,ZK	5
This course covers	basics of mathematical logic and graph theory. Syntax and semantics of propositional and predicate logic are introduced. The important and of the relationship between a formula and its model is stressed. Further, basic notions from graph theory are introduced.		onsequence
B0B01MA1	Mathematical Analysis 1	Z,ZK	7
	The aim of the course is to introduce students to basics of differential and integral calculus of functions of one variable.		
B0B01MA2	Mathematical Analysis 2	Z,ZK	7
The subject cove	rs an introduction to the differential and integral calculus in several variables and basic relations between curve and surface integrals	. Other part contain	ns function
	series and power series with application to Taylor and Fourier series.		
B0B01PST	Probability and Statistics	Z,ZK	7
B0B04A21	English Language A2-1	Z	
	The course is open to students who are beginners in their second language. Course objective: Achieving competence in basic E	nglish.	
B0B04A22	English Language A2-2	Z	0
The course is op	en to students who are beginners in their second foreign language. The course objective is to develop and sustain their basic knowle	dge of the English	language.
B0B04B11	English Language B1-1	Z	0
Course objective: E	Broadening the basic knowledge of general English; mastering basic specialised language; focusing on text analysis and vocabulary exp English.	pansion; understan	ding spoken
B0B04B12	English Language B1-2	Z	0
Course objective: E	Broadening the basic knowledge of general English; mastering basic specialised language; focusing on text analysis and vocabulary exp English.	pansion; understan	ding spoken
B0B04B1K	English language B1 - classified assessment verifying of the student's skills of B1 level	KZ	0
B0B04B21	English Language B2-1	Z	3
This course is desi	gned as a full-year, two semester preparation course for the university's compulsory B2-level English Examination (Anglický jazyk B2	- zkouška - B0B04l	B2Z*). While
	used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark) nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriate to the contract of the contract		
	/ International Study.		
B0B04B22	English Language B2-2	Z	3
	gned as a full-year, two semester preparation course for the university's compulsory B2-level English Examination (Anglický jazyk B2- used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark;		
	nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriation of the university level. *NOTE: This exam is also used for determining an appropriate properties of the university level. *NOTE: This exam is also used for determining an appropriate properties of the university level. *NOTE: This exam is also used for determining an appropriate properties of the university level. *NOTE: This exam is also used for determining an appropriate properties of the university level. *NOTE: This exam is also used for determining an appropriate properties of the university level. *NOTE: This exam is also used for determining an appropriate properties of the university level. *NOTE: This exam is also used for determining an appropriate properties of the university level. *NOTE: This exam is also used for determining an appropriate properties of the university level. *NOTE: This exam is also used for determining an appropriate properties of the university level. *NOTE: This exam is also used for determining an appropriate properties of the university level. *NOTE: This exam is also used for determining an appropriate properties of the university level. *NOTE: This exam is also used for determining an appropriate properties of the university level. *NOTE: This exam is also used for determining an appropriate properties of the university level. *NOTE: This exam is also used for determining an appropriate properties of the university level. *NOTE: This exam is also used for determining an appropriate properties of the university level. *NOTE: This exam is also used for determining an appropriate properties of the university level. *NOTE: This exam is also used for determining an appropriate properties of the university level. *NOTE: This exam is also used for determining an appropriate properties of the university level. *NOTE: This exam is also used for determining an appropriate properties of the university level. *NOTE: This exam is also used for determ		
B0B04B2Z	English language B2 - exam	Z,ZK	0
	English ranguage B2 - exam Exam is a compulsory subject for all Faculty of Electrical Engineering students at the Czech Technical University. According to the Stu	1 '	_
	Idents at CTU (Part III, Article 4), a compulsory subject is one "whose completion is a necessary condition in order to successfully co	-	
In addition, this r	equires the "passing of an examination evaluated on the scale A, B, C, D, or E" (SERR Part III, Article 6). II) According to the Comi	mon European Frai	mework of
Reference for Lang	juages (CEFR), an international standard for describing language ability, the definition of an English language learner who has achieve	ed the B2 (Upper-Ir	ntermediate)
	can understand the main ideas of complex text on both concrete and abstract topics, including technical discussions in his/her field luency and spontaneity that makes regular interaction with native speakers quite possible without strain for either party. Can produce	-	
• ,	and explain a viewpoint on a topical issue giving the advantages and disadvantages of various options." III) Students who have succ	* '	
international exam	within the past five years may present their certificate to the Department of Languages, Faculty of Electrical Engineering. Upon appr from both the Written Test and the Oral Part. For a list of approved international exams go the department website: http://jazyky.fe		nen exempt
DOD16ET1	Ethic 1		1
•	is to provide the students an orientation not only in general problems of ethics but above all to offer instructions for solving various sit		
	f the subject are discussions in which students can react to lectures but also to actual questions coming with news and look for the c		1
B0B16FI1	Philosophy 1	KZ	4
We deal with th	e most important persons, schools and ideas of ancient philosophy. We are concerned especially on transdisciplinary nature of philosophical thoughts with recent problems of acceptance to chapters, acceptance and political	sophy and connect	ion of old
	philosophical thoughts with recent problems of science, technology, economics and politics.		

	Philosophy	ZK	2
B0B16FIL We deal with th	ן היינוסטטרוץ e most important persons, schools and ideas of ancient philosophy. We are concerned especially on transdisciplinary nature of philoso		1
Wo dod war ar	philosophical thoughts with recent problems of science, technology, economics and politics.	priy una comico	1011 01 010
B0B16HI1	History 1	KZ	4
B0B16HT1	History of science and technology 1	KZ	4
B0B16HTE	History of technology and economic	ZK	2
B0B16MPL	Psychology for managers	ZK	2
B0B16MPS	Psychology	Z,ZK	4
B0B33OPT	Optimization	Z,ZK	7
he course provide	s an introduction to mathematical optimization, specifically to optimization in real vector spaces of finite dimension. The theory is illustrate	d with a number	of exampl
DODOE A DO	You will refresh and extend many topics that you know from linear algebra and calculus courses.	7 71/	
B0B35APO	Computer Architectures	Z,ZK	5
B0B36DBS	Database Systems	Z,ZK	6
	gned as a basic database course mainly aimed at the student ability to design a relational data model and to use the SQL language for		
data querying and	to choose the appropriate degree of transaction isolation. Students will also get acquainted with the most commonly used indexing te	-	ase syste
DODGED IV	architecture and their management. They will verify their knowledge during the elaboration of a continuously submitted seminar to		6
B0B36PJV	Programming in Java	Z,ZK	6
	on the basics of algorithms and programming from the first semester and introduces students to the Java environment. The course also		
	ge. The topics of the course includes exceptions, event handling, and building a graphical interface. Basic library methods, working with An important topic is models of multithreaded applications and their implementation. Practical exercises of practical skills and knowledg		
	isks and semester work, which will be submitted continuously through the source code version control system. The semester work sco		
- sg partial to	correctness and efficiency of the code, as well as points that take into account the quality of the source codes, their readability and re		50 101
B0B36PRP	Procedural Programming	Z,ZK	6
	panies basic programming emphasizing the data representation in computer memory. Furthermore, the concepts of linked data structure		1
	Students master the practical implementation of simple individual tasks. The course emphasizes acquiring programming habits for crea		
	time, the effort is to build students an overview of the program operation, data model, memory access, and management. Therefore,		
	es a direct link between the program data structures and their representation in the computer memory. Students will get acquainted not c		
-	with debugging and profiling. Labs aim to acquire practical skills of implementing simple individual tasks, emphasizing functionality and		
_	dence is developed by a set of homework with the possibility of optional and bonus assignments. The final task is an integration of a lai		
im	plementations. Evaluation of coding style motivated by writing legible, understandable, and maintainable codes is also a part of the se	lected tasks.	_
B4B01DMA	Discrete Mathematics	Z,ZK	5
	nots meet some important topics from the field of discrete mathematics. Namely, they will explore divisibility and calculations modulo n,	,	tions, bin
	ngs, cardinality of sets, induction, and recurrence equations. The second aim of this course is to teach students the language of mathe		
, ,,	actively, and introduce them to mathematics as science.	,	,
B4B01JAG	Languages, Automats and Gramatics	Z,ZK	6
	e theory of finite automata and grammars: deterministic and non deterministic finite automata, languages accepted by finite automata, re	•	_
		g	
	and languages generated by grammars with emphasis to context free grammars. A very brief introduction of Turing machines		
B4B01NUM	and languages generated by grammars with emphasis to context free grammars. A very brief introduction of Turing machines Numerical Analysis		6
	Numerical Analysis	Z,ZK	6 lations ar
The course introd		Z,ZK ranscendent equ	iations ar
The course introc systems of linea	Numerical Analysis luces to basic numerical methods of interpolation and approximation of functions, numerical differentiation and integration, solution of tar equations. Emphasis is put on estimation of errors, practical skills with the methods and demonstration of their properties using Map	Z,ZK ranscendent equ le and computer	iations an
The course introc systems of linea B4B33ALG	Numerical Analysis luces to basic numerical methods of interpolation and approximation of functions, numerical differentiation and integration, solution of tar equations. Emphasis is put on estimation of errors, practical skills with the methods and demonstration of their properties using Map Algorithms	Z,ZK ranscendent equ le and computer Z,ZK	graphics.
The course introc systems of lines B4B33ALG the course, the a	Numerical Analysis luces to basic numerical methods of interpolation and approximation of functions, numerical differentiation and integration, solution of the requations. Emphasis is put on estimation of errors, practical skills with the methods and demonstration of their properties using Map Algorithms algorithms development is constructed with minimum dependency to programming language; nevertheless the lectures and seminars a	Z,ZK rranscendent equ le and computer Z,ZK re based on Java	graphics. 6 a. Basic d
The course introc systems of lines B4B33ALG on the course, the a	Numerical Analysis luces to basic numerical methods of interpolation and approximation of functions, numerical differentiation and integration, solution of tar equations. Emphasis is put on estimation of errors, practical skills with the methods and demonstration of their properties using Map Algorithms	Z,ZK rranscendent equ le and computer Z,ZK re based on Java	graphics. 6 a. Basic d
The course introc systems of linea B4B33ALG the course, the a types a data stru	Numerical Analysis luces to basic numerical methods of interpolation and approximation of functions, numerical differentiation and integration, solution of the requations. Emphasis is put on estimation of errors, practical skills with the methods and demonstration of their properties using Map Algorithms algorithms development is constructed with minimum dependency to programming language; nevertheless the lectures and seminars a ctures, basic algorithms, recursive functions, abstract data types, stack, queues, trees, searching, sorting, special application algorithm. Students are able to design and construct non-trivial algorithms and to evaluate their effectivity.	Z,ZK rranscendent equ le and computer Z,ZK re based on Java ns, Dynamic prog	graphics. 6 a. Basic d
The course introc systems of linea B4B33ALG the course, the a types a data stru B4B33RPH	Numerical Analysis luces to basic numerical methods of interpolation and approximation of functions, numerical differentiation and integration, solution of the requations. Emphasis is put on estimation of errors, practical skills with the methods and demonstration of their properties using Map Algorithms algorithms development is constructed with minimum dependency to programming language; nevertheless the lectures and seminars a ctures, basic algorithms, recursive functions, abstract data types, stack, queues, trees, searching, sorting, special application algorithm Students are able to design and construct non-trivial algorithms and to evaluate their effectivity. Solving Problems and other Games	Z,ZK rranscendent equ le and computer Z,ZK re based on Javans, Dynamic prog	graphics. 6 a. Basic d gramming
The course introc systems of lines B4B33ALG the course, the a types a data stru B4B33RPH The main motiva	Numerical Analysis luces to basic numerical methods of interpolation and approximation of functions, numerical differentiation and integration, solution of the requations. Emphasis is put on estimation of errors, practical skills with the methods and demonstration of their properties using Map Algorithms algorithms development is constructed with minimum dependency to programming language; nevertheless the lectures and seminars a ctures, basic algorithms, recursive functions, abstract data types, stack, queues, trees, searching, sorting, special application algorithm. Students are able to design and construct non-trivial algorithms and to evaluate their effectivity.	Z,ZK rranscendent equ le and computer Z,ZK re based on Javans, Dynamic prog	graphics. 6 a. Basic d gramming 6 em, how
The course introc systems of linea B4B33ALG a the course, the a types a data stru B4B33RPH The main motiva define interfaces,	Numerical Analysis luces to basic numerical methods of interpolation and approximation of functions, numerical differentiation and integration, solution of the requations. Emphasis is put on estimation of errors, practical skills with the methods and demonstration of their properties using Map Algorithms algorithms development is constructed with minimum dependency to programming language; nevertheless the lectures and seminars a ctures, basic algorithms, recursive functions, abstract data types, stack, queues, trees, searching, sorting, special application algorithm Students are able to design and construct non-trivial algorithms and to evaluate their effectivity. Solving Problems and other Games ion is to let students to deal with real-world problems properly. When working on real problems the student shall learn how to decompose.	Z,ZK rranscendent equ le and computer Z,ZK re based on Javans, Dynamic prog KZ ose the big proble lem will not be so	graphics. 6 a. Basic d gramming 6 em, how t
The course introc systems of lines B4B33ALG the course, the a types a data struber B4B33RPH. The main motiva define interfaces, optimal way. The	Numerical Analysis luces to basic numerical methods of interpolation and approximation of functions, numerical differentiation and integration, solution of the requations. Emphasis is put on estimation of errors, practical skills with the methods and demonstration of their properties using Map Algorithms algorithms development is constructed with minimum dependency to programming language; nevertheless the lectures and seminars a ctures, basic algorithms, recursive functions, abstract data types, stack, queues, trees, searching, sorting, special application algorithm Students are able to design and construct non-trivial algorithms and to evaluate their effectivity. Solving Problems and other Games ion is to let students to deal with real-world problems properly. When working on real problems the student shall learn how to decomposition to test and validate individual steps and so on. Many problems will actually be beyond the first-year-student skills. And many problems	Z,ZK rranscendent equ le and computer Z,ZK re based on Javans, Dynamic prog KZ ose the big probletem will not be so ly, at the end of the	graphics. 6 a. Basic d gramming 6 em, how to the subject
The course introc systems of lines B4B33ALG the course, the a types a data struber B4B33RPH. The main motiva define interfaces, optimal way. The	Numerical Analysis luces to basic numerical methods of interpolation and approximation of functions, numerical differentiation and integration, solution of the requations. Emphasis is put on estimation of errors, practical skills with the methods and demonstration of their properties using Map Algorithms algorithms development is constructed with minimum dependency to programming language; nevertheless the lectures and seminars a ctures, basic algorithms, recursive functions, abstract data types, stack, queues, trees, searching, sorting, special application algorithm Students are able to design and construct non-trivial algorithms and to evaluate their effectivity. Solving Problems and other Games ion is to let students to deal with real-world problems properly. When working on real problems the student shall learn how to decompt how to test and validate individual steps and so on. Many problems will actually be beyond the first-year-student skills. And many probunsolved parts should motivate the students to study difficult theoretical subjects. They should generate the important questions. Ideal	Z,ZK rranscendent equ le and computer Z,ZK re based on Javans, Dynamic prog KZ ose the big probletem will not be so ly, at the end of the	graphics. 6 a. Basic d gramming 6 em, how to the subject
The course introc systems of lines B4B33ALG the course, the a types a data struber B4B33RPH. The main motiva define interfaces, optimal way. The	Numerical Analysis luces to basic numerical methods of interpolation and approximation of functions, numerical differentiation and integration, solution of the requations. Emphasis is put on estimation of errors, practical skills with the methods and demonstration of their properties using Map Algorithms Algorithms Algorithms development is constructed with minimum dependency to programming language; nevertheless the lectures and seminars a ctures, basic algorithms, recursive functions, abstract data types, stack, queues, trees, searching, sorting, special application algorithm Students are able to design and construct non-trivial algorithms and to evaluate their effectivity. Solving Problems and other Games ion is to let students to deal with real-world problems properly. When working on real problems the student shall learn how to decompt how to test and validate individual steps and so on. Many problems will actually be beyond the first-year-student skills. And many problems unsolved parts should motivate the students to study difficult theoretical subjects. They should generate the important questions. Ideal be eager to study deeper about informatics. The course also explains the basis of the object oriented design, software testing, ways for	Z,ZK rranscendent equ le and computer Z,ZK re based on Javans, Dynamic prog KZ ose the big probletem will not be so ly, at the end of the	graphics. 6 a. Basic d gramming 6 em, how to olived in the subject
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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 artificial intelligence. More information is available at https://prg.ai/minor. B4B38PSIA Computer Networks Z.ZK 5 B4BPROJ6 Unassisted project 6 BBAP20 Bachelor thesis Ζ 20 BE4B33SEA Subject in english - abroad Z,ZK 0 The subject serves for validation of the duty to complete at least one compulsory course of the program in English. BE4B36FUP Functional Programming Z,ZK 6 This course introduces students into the techniques of functional programming, the advantages and disadvantages of this programming paradigm, and its use in practice. This approach is declarative in the sense that the programmer symbolically describes the problem to be solved, rather than specifying the exact sequence of operations required to solve it. It allows focusing on the essence of the solved problem and implementing even more complex algorithms compactly. Functional programming has notable advantages for parallelization and automated verification of algorithms, and the most useful functional programming concepts are increasingly often introduced to standard programming languages. Because of the focus of functional programming on symbols, rather than numbers, functional programming has been heavily used in in artificial intelligence fields, such as agent systems or symbolic machine learning. 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. BE4B36ZUI Introduction to Artificial Intelligence The aim of the course is to cover the basics of symbolic artificial intelligence. We will focus on algorithms of informed and uninformed state space search, problem representation and solving, representation of knowledge using formal logic, methods of automated reasoning, and an introduction to Markov decision making, and to two-player games. 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. BE4B38PSIA Computer Networks Subject is devoted to principles and technologies of Computer Networks. Physical layer media, analog and digital modulations, network topologies, MAC methods, ARQ algorithms, data communication models, coding and cryptography basics are introduced. Widely used LAN technologies are then presented together with their features. Internet protocols are explained and internetworking approaches are presented. BF4B39VGO Creating graphic content The aim of this course is to provide theory behind geometric modeling and modeling of materials, give students an overview of methods used in the process of creating 2D and 3D graphics and how to apply those methods in praxis. At the seminars, students will learn how to design and create three-dimensional scene, create and apply textures imitating materials (e.g., wall finishes, wood, sky) and geometrical details, and position and set-up lights in the scene. BE5B32PKS Computer and Communication Networks 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 networks. The course is aimed rather primarily practically then theoretically. BE5B33RPZ Pattern Recognition and Machine Learning Z.ZK 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. BE5B35APO Computer Architectures Z.ZK Subject provides overview of basic building blocks of computer systems. Explanation starts from hardware side where it extends knowledge presented in the previous lectures of Structures of computer systems. Topics cover building blocks description, CPU structure, multiple processors interconnections, input/output subsystem and basic overview of network and buses topologies. Emphasis is placed on clarification of interconnection of hardware components with software support, mainly lower levels of operating systems, device drivers and virtualization techniques. General principles are more elaborated during presentation of examples of multiple standard CPU architectures. Exercises are more focused on the software view to the contrary. Students are lead from basic programming on CPU level to the interaction with raw hardware. BE5B35LSP Logic Systems and Processors 7.7K 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 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. BF7B Safety in Electrical Engineering for a bachelor's degree 0 The purpose of the safety course is to give the students basic knowledge of electrical equipment and installation as to avoid danger arising from operation of it. This introductory course contains fundamentals of Safety Electrical Engineering. In this way the students receive qualification of instructed person that enables them to work on electrical equipment. Basic health and occupational safety regulations The guidelines were worked out based on The Training Scheme for Health and Occupational Safety designed for employees and students of the Czech Technical University in Prague, which was provided by the Rector's Office of the CTU. Safety is considered one of the basic duties of all employees and students. The knowledge of Health and Occupational Safety regulations forms an integral and permanent part of qualification requirements. This program is obligatory. TV-V1 Physical education 1

For updated information see http://bilakniha.cvut.cz/en/f3.html Generated: day 2024-07-27, time 09:07.

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