Study plan

Name of study plan: Open Informatics

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: 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: 2015_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:

Note on the gr		1	1			
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 Petr Pošík Petr Pošík Petr Pošík (Gar.)	Z,ZK	0		Z,L	Р
BE5B32PKS	Computer and Communication Networks Pavel Bezpalec Pavel Bezpalec	Z,ZK	6	2P + 2C	Z	Р
BE5B35APO	Computer Architectures Pavel Píša, Richard Šusta Pavel Píša Pavel Píša (Gar.)	Z,ZK	6	2P+2L	L	Р
BE4B38PSIA	Computer Networks Ji í Novák, Jan Holub Ji í Novák Ji í Novák (Gar.)	Z,ZK	5	2P+2L	L	Р
BE4B36FUP	Functional Programming Rostislav Hor ík, Tomáš Votroubek Rostislav Hor ík Michal P chou ek (Gar.)	Z,ZK	6	2P+2C	L	Р
BE4B36ZUI	Introduction to Artificial Intelligence Branislav Bošanský, Villam Lisý Branislav Bošanský (Gar.) Branislav Bošanský	Z,ZK	6	2P+2C	L	Р
BE5B35LSP	Logic Systems and Processors Richard Susta, Martin Hlinovský Martin Hlinovský Richard Šusta (Gar.)	Z,ZK	6	3P+2L	Z	Р
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	Р
BE4B35PSR	Real-time Systems Programming Michal Sojka Michal Sojka (Gar.)	Z,ZK	6	2P+2C	Z	Р
BE4B39VGO	Creating graphic content Ladislav molík Ladislav molík (Gar.)	Z,ZK	6	2P+2C+8D	Z	Р

Characteristics of the courses of this group of Study Plan: Code=2015_BOIAPP Name=Subjects in english

Characteristics of the courses of this group of Study Flan. Code=2013_BOIAFF 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	Z,ZK	6				
The aim of the course is to familiarize students with current trends in the switched local networks and the key functions of routing protocols in IP networks. The course is aimed rather							
primarily practically then theoretically.							
BE5B35APO	Computer Architectures	Z.ZK	6				

Subject provides overview of basic building blocks of computer systems. Explanation starts from hardware side where it extends knowledge 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

7.7K

5

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

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

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 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

7 7K

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 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

7 7K

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 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.

BE4B35PSR Real-time Systems Programming

Z,ZK

6

The goal of this course is to provide students with basic knowledge about software development for real-time systems, for example in control and embedded applications. The main focus is on embedded systems equipped with a real-time operating system (RTOS). Lectures will cover real-time systems theory, which can be used to formally verify timing correctness such systems. Another set of lectures will introduce methods and techniques used for development of safety-critical systems, whose failure may have catastrophic consequences. During labs, students will first solve a few simple tasks to familiarize them with basic components of VxWorks RTOS and to benchmark the used OS and hardware (Xilinx Zynq). The obtained metrics represent the typical criteria for assessing the suitability of a given platform for the given application. After the simple tasks, students will solve complex task of time-critical motion control application which will require full utilization of RTOS features. All the tasks at the labs will be implemented in C (or C++) language.

BE4B39VGO Creating graphic content

7 71

6

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.

Code of the group: 2015_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 mejla Roman mejla (Gar.)	Z	20	12S	L,Z	Р

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

BBAP20	Bachelor thesis	Z	20
--------	-----------------	---	----

Code of the group: 2015 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:

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

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

BEZB	Safety in Electrical Engineering for a Bachelor's Degree	Z	0			
The purpose of the safe	The purpose of the safety course is to give the students basic knowledge of electrical equipment and installation as to avoid danger arising from operation of it. This introductory course					
contains fundamentals of Safety Electrical Engineering. In this way the students receive qualification of instructed person that enables them to work on electrical equipment.						
BEZZ	Basic Health and Occupational Safety Regulations	Z	0			
The guidelines were worked out based on The Training Scheme for Health and Occupational Safety designed for employees and students of the Czech Technical University in Prague,						
which was provided by the Rector's Office of the CTU. Safety is considered one of the basic duties of all employees and students. The knowledge of Health and Occupational Safety						
regulations forms an integral and permanent part of qualification requirements. This program is obligatory.						

Code of the group: 2015_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:

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

Characteristics of the courses of this group of Study Plan: Code=2015 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 solvi	ing various situations of hum	an life. Essential
parts of the subject a	re 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 mo	st important persons, schools and ideas of ancient philosophy. We are concerned especially on transdisciplinary natu	ire of philosophy and connec	ction of old
philosophical though	is with recent problems of science, technology, economics and politics.		
B0B16FI1	Philosophy 1	KZ	4
We deal with the mo	st important persons, schools and ideas of ancient philosophy. We are concerned especially on transdisciplinary natu	re of philosophy and connec	ction of old
philosophical though	is 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
	D 1 1 (ZK	0
B0B16MPL	Psychology for managers	ZN	2

Code of the group: 2015_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 Daniel Pr ša 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, Václav Kratochvíl Martin imná Martin imná (Gar.)	Z,ZK	6	2P+2C+4D	L	Р
B4B01DMA	Discrete Mathematics Petr Habala Petr Habala (Gar.)	Z,ZK	5	2P+2S	Z	Р
B0B01LAG	Linear Algebra Ji í Velebil, Jakub Rondoš, 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 and Graphs Natalie Žukovec, Mat j Dostál, Alena Gollová Alena Gollová Marie Demlová (Gar.)	Z,ZK	5	3P+2S	Z,L	Р
B0B01MA1	Mathematical Analysis 1 Josef Dvo ák, Martin K epela, Josef Tkadlec, Veronika Sobotíková Josef Tkadlec Josef Tkadlec (Gar.)	Z,ZK	7	4P+2S	Z,L	Р
B0B01MA2	Mathematical Analysis 2 Miroslav Korbelá, Petr Hájek, Martin Bohata, Jaroslav Tišer, Karel Pospíšil, Paola Vivi, Hana Tur inová Petr Hájek Jaroslav Tišer (Gar.)	Z,ZK	7	4P+2S	L,Z	Р
B4B35OSY	Operating Systems Michal Sojka, 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 Mat j Kafka, Michal Jakob 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 Kate ina Helisová 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+7D	L	Р
B4B33RPH	Solving Problems and other Games Petr Pošík, Tomáš Svoboda Petr Pošík Tomáš Svoboda (Gar.)	KZ	6	2P+3C	Z	Р
B4BPROJ6	Unassisted project Petr Pošík, Tomáš Svoboda, Ji í Šebek, Jaroslav Sloup, Ivan Jelínek, Katarína Žmolíková Petr Pošík	Z	6	0+2	Z,L	Р

Characteristics of the courses of this group of Study Plan: Code=2015_BOIP Name=Compulsory subjects of	the program	ıme			
B4B33ALG Algorithms	Z,ZK	6			
In the course, the algorithms development is constructed with minimum dependency to programming language; nevertheless the lectures and semina	rs are based on	Java. Basic data			
types a data structures, basic algorithms, recursive functions, abstract data types, stack, queues, trees, searching, sorting, special application algorithms	nms, Dynamic pr	ogramming.			
Students are able to design 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 as a basic database course mainly aimed at the student ability to design a relational data model and to use the SQL language	e for data definiti	on 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 indexing	techniques, data	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 e	quations, binary			
relations, mappings, cardinality of sets, induction, and recurrence equations. The second aim of this course is to teach students the language of math	ematics, both pa	ssively 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 ir	ndependence, ba	sis, coordinates,			
etc). The calculus of matrices (determinants, inverse matrices, matrices of a linear map, eigenvalues and eigenvectors, diagonalisation, etc) is covere	d next. The appli	cations include			
solving systems of linear equations, the geometry of a 3D space (including the scalar product and the vector product) and SVD.					
B0B01LGR Logic and 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 importa	nce of the notion	of consequence			
and of the relationship 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 course is to introduce students to basics of differential and integral calculus of functions of one variable.	·				

B0B01MA2 Mathematical Analysis 2 The subject covers an introduction to the differential and integral calculus in several variables and basic relations between curve and surface integrals. Other part contains function series and power series with application to Taylor and Fourier series. B4B35OSY **Operating Systems** Z,ZK Lecture introduces operation system's basic concepts and principles as processes, threads, communication and synchronization, virtual memory, drivers, file systems, basic security aspects. These topics are theoretically described and demonstrated on Linux and Windows OS with multi-core systems. Practical exercises from OS in C programming language will be solved on labs. Students will work with Linux OS and micro-kernel NOVA. B0B33OPT Z,ZK Optimization The course provides an introduction to mathematical optimization, specifically to optimization in real vector spaces of finite dimension. The theory is illustrated with a number of examples. You will refresh and extend 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 Z,ZK Probability and Statistics B0B36PRP Procedural Programming Z,ZK6 The course accompanies basic programming emphasizing the data representation in computer memory. Furthermore, the concepts of linked data structures and processing user inputs are developed. Students master the practical implementation of simple individual tasks. The course emphasizes acquiring programming habits for creating readable and reusable programs. At the same time, the effort is to build students an overview of the program operation, data model, memory access, and management. Therefore, the C programming language is used that provides a direct link between the program data structures and their representation in the computer memory. Students will get acquainted not only with program compilation and linking but also with debugging and profiling. Labs aim to acquire practical skills of implementing simple individual tasks, emphasizing functionality and accuracy of implementation. Student independence is developed by a set of homework with the possibility of optional and bonus assignments. The final task is an integration of a larger program using existing implementations. Evaluation of coding style motivated by writing legible, understandable, and maintainable codes is also a part of the selected tasks. B0B36PJV Programming in Java The course builds on the basics of algorithms and programming from the first semester and introduces students to the Java environment. The course also focus on the object concept of the Java language. The topics of the course includes exceptions, event handling, and building a graphical interface. Basic library methods, working with files and using generic types will be introduced. An important topic is models of multithreaded applications and their implementation. Practical exercises of practical skills and knowledge of Java is tested in the form of solving partial tasks and semester work, which will be submitted continuously through the source code version control system. The semester work scoring consists of points for the

correctness and efficiency 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

The main motivation is to let students to deal with real-world problems properly. When working on real problems the student shall learn how to decompose the big problem, how to define interfaces, how to test and validate individual steps and so on. Many problems will actually be beyond the first-year-student skills. And many problem will not be solved in the

optimal way. The unsolved parts should motivate the students to study difficult theoretical subjects. They should generate the important questions. Ideally, at the end of the subject, the student should be eager to study deeper about informatics. The course also explains the basis of the object oriented design, software testing, ways for writing readable and robust codes.

B4BPROJ6 Unassisted project Ζ 6

Code of the group: 2015_BZAJ

Name of the group: Exam from the english language

Requirement credits in the group:

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

Credits in the group: 0 Note on the group:

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

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

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

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

Name of the block: Compulsory courses of the specialization

Minimal number of credits of the block: 30

The role of the block: PO

Code of the group: 2015_BOIPO1

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:

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 ík, Tomáš Votroubek Rostislav Hor ík Michal P chou ek (Gar.)	Z,ZK	6	2P+2C	L	PO
B4B01JAG	Languages, Automats and Gramatics Marie Demlová, Ji í Demel Marie Demlová Marie Demlová (Gar.)	Z,ZK	6	2P+2S	Z	РО
B4B01NUM	Numerical Analysis Mirko Navara, Aleš N me ek Mirko Navara Mirko Navara (Gar.)	Z,ZK	6	2P+2C	Z	РО
B4B33RPZ	Recognition and Machine Learning Ond ej Drbohlav, Ji í Matas, Jan Šochman Jan Šochman Ji í Matas (Gar.)	Z,ZK	6	2P+2C	Z	РО
B4B36ZUI	Introduction to Artificial Intelligence Branislav Bošanský, Viliam Lisý Branislav Bošanský Michal P chou ek (Gar.)	Z,ZK	6	2P+2C	L	РО

Characteristics of the courses of this group of Study Plan: Code=2015_BOIPO1 Name=Compulsory subjects of the branch

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

Z,ZK

О

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.

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 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

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.

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

The role of the block: V

Code of the group: 2015_BJKA

Name of the group: English language courses

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

Credits in the group: 0 Note on the 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	Z	3	2C	Z,L	V

B0B04A21	English Language A2-1	Z	
The course is open	to students who are beginners in their second language. Course objective: Achieving competence in basic English.	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 know	ledge of the Eng	lish language.
B0B04B11	English Language B1-1	Z	0
•	oadening the basic knowledge of general English; mastering basic specialised language; focusing on text analysis and vocabulary	expansion; unde	erstanding spoken
English.			
B0B04B12	English Language B1-2	Z	0
Course objective: Br	oadening the basic knowledge of general English; mastering basic specialised language; focusing on text analysis and vocabulary	expansion: unde	erstanding spoken
•	oddenning the basic knowledge of general English, mastering basic specialised language, locasing on text analysis and vocabulary	y expansion, and	
English. B0B04B21	English Language B2-1	Z	3
English. B0B04B21		Z	3
English. B0B04B21 This course is desig	English Language B2-1	Z B2 - zkouška - B	3 0B04B2Z*). While
English. B0B04B21 This course is desig the course is focuse	English Language B2-1 ned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk	Z B2 - zkouška - B k), it also focuse:	3 0B04B2Z*). While s more on the
English. B0B04B21 This course is desig the course is focuse	English Language B2-1 ned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk d on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mar ical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an approximation of the provided in the provide	Z B2 - zkouška - B k), it also focuse:	3 0B04B2Z*). While s more on the
English. B0B04B21 This course is desig the course is focuse academic and techn	English Language B2-1 ned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk d on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mar ical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an approximation of the provided in the provide	Z B2 - zkouška - B k), it also focuse:	3 0B04B2Z*). While s more on the
English. B0B04B21 This course is desig the course is focuse academic and techn / International Study B0B04B22	English Language B2-1 ned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk d on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mar ical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an approx.	Z B2 - zkouška - B rk), it also focuse: opriate level of Er	3 0B04B2Z*). While is more on the niglish for Erasmus
English. B0B04B21 This course is desig the course is focuse academic and techn / International Study B0B04B22 This course is desig	English Language B2-1 ned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk d on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mar ical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an approx. English Language B2-2	Z B2 - zkouška - B ck), it also focuse: opriate level of Er Z B2 - zkouška - B0	3 0B04B2Z*). While is more on the aglish for Erasmus 3 0B04B2Z*). While
English. B0B04B21 This course is desig the course is focuse academic and techn / International Study B0B04B22 This course is desig the course is focuse	English Language B2-1 ned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk d on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mar ical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an approx. English Language B2-2 ned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk I	Z B2 - zkouška - B ck), it also focuse: opriate level of Er Z B2 - zkouška - B(ck), it also focuse:	3 0B04B2Z*). While is more on the aglish for Erasmus 3 0B04B2Z *). 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 Ji í Drnek	Z	2	0+2	L,Z	V
TV-V1	Physical education	Z	1	0+2	Z,L	V
TVV0	Physical education	Z	0	0+2	Z,L	V

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

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

Code of the group: BTVK

Name of the group: Physical education courses

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

Credits in the group: 0

Note on the group:

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

	TVKZV	Physical Education Course	Z	0	7dní	Z	V
--	-------	---------------------------	---	---	------	---	---

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

	0 1 7		
TVKLV	Physical Education Course	Z	0
TVKZV	Physical Education Course	Z	0

Code of the group: 2015_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
	he initial parts of linear algebra. Firstly, the basic notions of a linear space and linear mappings are covered (linear dependence and ind		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	VD.	
B0B01LGR	Logic and Graphs	Z,ZK	5
This course covers	pasics of mathematical logic and graph theory. Syntax and semantics of propositional and predicate logic are introduced. The important	ce of the notion of c	onsequence
	and of the relationship between a formula and its model is stressed. Further, basic notions from graph theory are introduce	d.	
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.	,	I
B0B01MA2	Mathematical Analysis 2	Z,ZK	7
The subject cover	s an introduction to the differential and integral calculus in several variables and basic relations between curve and surface integrals	1 '	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.	1
B0B04A22	English Language A2-2	7	0
	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: B	roadening the basic knowledge of general English; mastering basic specialised language; focusing on text analysis and vocabulary ex	n — pansion; understan	ding spoker
•	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 vocabulary ex	pansion; understan	ding spoker
	English.		
B0B04B1K	English language B1 - classified assessment	KZ	0
'	verifying of the student's skills of B1 level	1	'
B0B04B21	English Language B2-1	Z	3
This course is design	ned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2	- zkouška - B0B04l	32Z*). While
the course is focu	sed on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark	, it also focuses m	ore on the
academic and tech	nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropri	ate level of English	for Erasmus
	/ International Study.		
B0B04B22	English Language B2-2	Z	3
This course is design	ned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 ·	zkouška - B0B04E	32Z *). While
the course is focu	ised on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), it also focuses m	ore on the
academic and tech	nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropria	ate level of English	for Erasmus
DoDo : 5 - 5	/ International Study.		
B0B04B2Z	English language B2 - exam	Z,ZK	0
,	xam is a compulsory subject for all Faculty of Electrical Engineering students at the Czech Technical University. According to the Stu	•	
•	dents at CTU (Part III, Article 4), a compulsory subject is one whose completion is a necessary condition in order to successfully core		•

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/

B0B16ET1	Ethic 1	KZ	4
	s to provide the students an orientation not only in general problems of ethics but above all to offer instructions for solving various situ	ı ıations of human li	ife. Essential
parts of	the subject are discussions in which students can react to lectures but also to actual questions coming with news and look for the co	ommunal answers	
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 philosophy.	ophy and connect	ion of old
	philosophical thoughts with recent problems of science, technology, economics and politics.		
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 philosophy.	ophy and connect	tion of old
B0B16HI1	philosophical thoughts with recent problems of science, technology, economics and politics.	1/7	1
	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
The course provides	s an introduction to mathematical optimization, specifically to optimization in real vector spaces of finite dimension. The theory is illustrat You will refresh and extend many topics that you know from linear algebra and calculus courses.	ed with a number	of examples.
DOD25 A DO		7 71/	
B0B35APO	Computer Architectures	Z,ZK Z,ZK	5
B0B36DBS	Database Systems ned as a basic database course mainly aimed at the student ability to design a relational data model and to use the SQL language for		6 s well as for
_	to choose the appropriate degree of transaction isolation. Students will also get acquainted with the most commonly used indexing t		
	architecture and their management. They will verify their knowledge during the elaboration of a continuously submitted seminar		,
B0B36PJV	Programming in Java	Z,ZK	6
	n the basics of algorithms and programming from the first semester and introduces students to the Java environment. The course also		ject concept
of the Java languag	e. The topics of the course includes exceptions, event handling, and building a graphical interface. Basic library methods, working with	h files and using g	eneric types
	an important topic is models of multithreaded applications and their implementation. Practical exercises of practical skills and knowledge	-	
of solving partial tas	sks and semester work, which will be submitted continuously through the source code version control system. The semester work so		oints for the
50500555	correctness and efficiency of the code, as well as points that take into account the quality of the source codes, their readability and i	-	
B0B36PRP	Procedural Programming	Z,ZK	6
· ·	anies basic programming emphasizing the data representation in computer memory. Furthermore, the concepts of linked data structur Eudents master the practical implementation of simple individual tasks. The course emphasizes acquiring programming habits for cre		
-	me time, the effort is to build students an overview of the program operation, data model, memory access, and management. Therefore	-	
	s a direct link between the program data structures and their representation in the computer memory. Students will get acquainted not		
	with debugging and profiling. Labs aim to acquire practical skills of implementing simple individual tasks, emphasizing functionality an		-
Student independ	ence is developed by a set of homework with the possibility of optional and bonus assignments. The final task is an integration of a la	arger program usi	ng existing
imr	plamentations. Evaluation of goding atula mativated by writing legible, understandable, and maintainable godes is also a part of the sy		
i	plementations. Evaluation of coding style motivated by writing legible, understandable, and maintainable codes is also a part of the so	elected tasks.	Г
B4B01DMA	Discrete Mathematics	Z,ZK	5
B4B01DMA In this course stude	Discrete Mathematics nts meet some important topics from the field of discrete mathematics. Namely, they will explore divisibility and calculations modulo n,	Z,ZK diophantine equa	tions, binary
B4B01DMA In this course stude	Discrete Mathematics nts meet some important topics from the field of discrete mathematics. Namely, they will explore divisibility and calculations modulo n, gs, cardinality of sets, induction, and recurrence equations. The second aim of this course is to teach students the language of math	Z,ZK diophantine equa	tions, binary
B4B01DMA In this course stude relations, mappin	Discrete Mathematics nts meet some important topics from the field of discrete mathematics. Namely, they will explore divisibility and calculations modulo n, gs, cardinality of sets, induction, and recurrence equations. The second aim of this course is to teach students the language of math actively, and introduce them to mathematics as science.	Z,ZK diophantine equa ematics, both pas	tions, binary sively and
B4B01DMA In this course stude relations, mappin	Discrete Mathematics nts meet some important topics from the field of discrete mathematics. Namely, they will explore divisibility and calculations modulo n, gs, cardinality of sets, induction, and recurrence equations. The second aim of this course is to teach students the language of math actively, and introduce them to mathematics as science. Languages, Automats and Gramatics	Z,ZK diophantine equa ematics, both pas Z,ZK	sively and
B4B01DMA In this course stude relations, mappin	Discrete Mathematics nts meet some important topics from the field of discrete mathematics. Namely, they will explore divisibility and calculations modulo n, gs, cardinality of sets, induction, and recurrence equations. The second aim of this course is to teach students the language of math actively, and introduce them to mathematics as science.	Z,ZK diophantine equa ematics, both pas Z,ZK egular expressions	sively and
B4B01DMA In this course stude relations, mappin B4B01JAG Basic notions of the	Discrete Mathematics nts meet some important topics from the field of discrete mathematics. Namely, they will explore divisibility and calculations modulo n, gs, cardinality of sets, induction, and recurrence equations. The second aim of this course is to teach students the language of math actively, and introduce them to mathematics as science. Languages, Automats and Gramatics theory of finite automata and grammars: deterministic and non deterministic finite automata, languages accepted by finite automata, re and languages generated by grammars with emphasis to context free grammars. A very brief introduction of Turing machine	Z,ZK diophantine equa ematics, both pas Z,ZK egular expressions s.	tions, binary sively and 6 s. Grammars
B4B01DMA In this course stude relations, mappin B4B01JAG Basic notions of the	Discrete Mathematics nts meet some important topics from the field of discrete mathematics. Namely, they will explore divisibility and calculations modulo n, gs, cardinality of sets, induction, and recurrence equations. The second aim of this course is to teach students the language of math actively, and introduce them to mathematics as science. Languages, Automats and Gramatics theory of finite automata and grammars: deterministic and non deterministic finite automata, languages accepted by finite automata, re	Z,ZK diophantine equa ematics, both pas Z,ZK egular expressions s. Z,ZK	tions, binary sively and 6 s. Grammars
B4B01DMA In this course stude relations, mappin B4B01JAG Basic notions of the B4B01NUM The course introdu	Discrete Mathematics Ints meet some important topics from the field of discrete mathematics. Namely, they will explore divisibility and calculations modulo n, gs, cardinality of sets, induction, and recurrence equations. The second aim of this course is to teach students the language of math actively, and introduce them to mathematics as science. Languages, Automats and Gramatics theory of finite automata and grammars: deterministic and non deterministic finite automata, languages accepted by finite automata, re and languages generated by grammars with emphasis to context free grammars. A very brief introduction of Turing machine Numerical Analysis	Z,ZK diophantine equa ematics, both pas Z,ZK egular expressions ss. Z,ZK transcendent equ	titions, binary sively and 6 s. Grammars 6 uations and
B4B01DMA In this course stude relations, mappin B4B01JAG Basic notions of the B4B01NUM The course introdu	Discrete Mathematics Ints meet some important topics from the field of discrete mathematics. Namely, they will explore divisibility and calculations modulo n, gs, cardinality of sets, induction, and recurrence equations. The second aim of this course is to teach students the language of math actively, and introduce them to mathematics as science. Languages, Automats and Gramatics theory of finite automata and grammars: deterministic and non deterministic finite automata, languages accepted by finite automata, re and languages generated by grammars with emphasis to context free grammars. A very brief introduction of Turing machine Numerical Analysis uces to basic numerical methods of interpolation and approximation of functions, numerical differentiation and integration, solution of	Z,ZK diophantine equa ematics, both pas Z,ZK egular expressions ss. Z,ZK transcendent equ	titions, binary sively and 6 s. Grammars 6 uations and
B4B01DMA In this course stude relations, mappin B4B01JAG Basic notions of the B4B01NUM The course introdusystems of linear B4B33ALG	Discrete Mathematics Into meet some important topics from the field of discrete mathematics. Namely, they will explore divisibility and calculations modulo n, gs, cardinality of sets, induction, and recurrence equations. The second aim of this course is to teach students the language of math actively, and introduce them to mathematics as science. Languages, Automats and Gramatics theory of finite automata and grammars: deterministic and non deterministic finite automata, languages accepted by finite automata, and languages generated by grammars with emphasis to context free grammars. A very brief introduction of Turing machine Numerical Analysis Loces to basic numerical methods of interpolation and approximation of functions, numerical differentiation and integration, solution of requations. Emphasis is put on estimation of errors, practical skills with the methods and demonstration of their properties using Ma	Z,ZK diophantine equa ematics, both pas Z,ZK egular expressions ss. Z,ZK transcendent equ ple and computer Z,ZK	tions, binary sively and 6 s. Grammars 6 lations and graphics. 6
B4B01DMA In this course stude relations, mappin B4B01JAG Basic notions of the B4B01NUM The course introdusystems of linear B4B33ALG In the course, the all	Discrete Mathematics Into meet some important topics from the field of discrete mathematics. Namely, they will explore divisibility and calculations modulo n, gs, cardinality of sets, induction, and recurrence equations. The second aim of this course is to teach students the language of math actively, and introduce them to mathematics as science. Languages, Automats and Gramatics theory of finite automata and grammars: deterministic and non deterministic finite automata, languages accepted by finite automata, and languages generated by grammars with emphasis to context free grammars. A very brief introduction of Turing machine Numerical Analysis uces to basic numerical methods of interpolation and approximation of functions, numerical differentiation and integration, solution of requations. Emphasis is put on estimation of errors, practical skills with the methods and demonstration of their properties using Ma Algorithms Igorithms development is constructed with minimum dependency to programming language; nevertheless the lectures and seminars of the special application algorithms, application algorithms, special application algorithms.	Z,ZK diophantine equa ematics, both pas Z,ZK egular expressions es. Z,ZK transcendent equ ple and computer Z,ZK are based on Java	tions, binary sively and 6 s. Grammars 6 lations and graphics. 6 a. Basic data
B4B01DMA In this course stude relations, mappin B4B01JAG Basic notions of the B4B01NUM The course introdusystems of linear B4B33ALG In the course, the atypes a data structure.	Discrete Mathematics Into meet some important topics from the field of discrete mathematics. Namely, they will explore divisibility and calculations modulo n, gs, cardinality of sets, induction, and recurrence equations. The second aim of this course is to teach students the language of math actively, and introduce them to mathematics as science. Languages, Automats and Gramatics theory of finite automata and grammars: deterministic and non deterministic finite automata, languages accepted by finite automata, and languages generated by grammars with emphasis to context free grammars. A very brief introduction of Turing machine Numerical Analysis uces to basic numerical methods of interpolation and approximation of functions, numerical differentiation and integration, solution of requations. Emphasis is put on estimation of errors, practical skills with the methods and demonstration of their properties using Ma Algorithms Igorithms development is constructed with minimum dependency to programming language; nevertheless the lectures and seminars stures, basic algorithms, recursive functions, abstract data types, stack, queues, trees, searching, sorting, special application algorith Students are able to design and construct non-trivial algorithms and to evaluate their effectivity.	Z,ZK diophantine equa ematics, both pas Z,ZK egular expressions es. Z,ZK transcendent equ ple and computer Z,ZK are based on Java ums, Dynamic prog	tions, binary sively and 6 s. Grammars 6 lations and graphics. 6 a. Basic data gramming.
B4B01DMA In this course stude relations, mappin B4B01JAG Basic notions of the B4B01NUM The course introdusystems of linear B4B33ALG In the course, the altypes a data struct B4B33RPH	Discrete Mathematics Into meet some important topics from the field of discrete mathematics. Namely, they will explore divisibility and calculations modulo n, gs, cardinality of sets, induction, and recurrence equations. The second aim of this course is to teach students the language of math actively, and introduce them to mathematics as science. Languages, Automats and Gramatics theory of finite automata and grammars: deterministic and non deterministic finite automata, languages accepted by finite automata, re and languages generated by grammars with emphasis to context free grammars. A very brief introduction of Turing machine Numerical Analysis Lices to basic numerical methods of interpolation and approximation of functions, numerical differentiation and integration, solution of requations. Emphasis is put on estimation of errors, practical skills with the methods and demonstration of their properties using Mathgorithms Igorithms Igorithms development is constructed with minimum dependency to programming language; nevertheless the lectures and seminars setures, basic algorithms, recursive functions, abstract data types, stack, queues, trees, searching, sorting, special application algorithms are able to design and construct non-trivial algorithms and to evaluate their effectivity. Solving Problems and other Games	Z,ZK diophantine equa ematics, both pas Z,ZK egular expressions is. Z,ZK transcendent equ ple and computer Z,ZK are based on Java ims, Dynamic prog	titions, binary sively and 6 s. Grammars 6 sations and graphics. 6 s. Basic data gramming. 6
B4B01DMA In this course stude relations, mappin B4B01JAG Basic notions of the B4B01NUM The course introdusystems of linear B4B33ALG In the course, the artypes a data struct B4B33RPH The main motivati	Discrete Mathematics Into meet some important topics from the field of discrete mathematics. Namely, they will explore divisibility and calculations modulo n, gs, cardinality of sets, induction, and recurrence equations. The second aim of this course is to teach students the language of math actively, and introduce them to mathematics as science. Languages, Automats and Gramatics theory of finite automata and grammars: deterministic and non deterministic finite automata, languages accepted by finite automata, reand languages generated by grammars with emphasis to context free grammars. A very brief introduction of Turing machine Numerical Analysis Loces to basic numerical methods of interpolation and approximation of functions, numerical differentiation and integration, solution of requations. Emphasis is put on estimation of errors, practical skills with the methods and demonstration of their properties using Mathgorithms Identity of the properties and seminars and seminars development is constructed with minimum dependency to programming language; nevertheless the lectures and seminars and seminars are able to design and construct non-trivial algorithms and to evaluate their effectivity. Solving Problems and other Games on is to let students to deal with real-world problems properly. When working on real problems the student shall learn how to decomp	Z,ZK diophantine equa ematics, both pas Z,ZK egular expressions is. Z,ZK transcendent equ ple and computer Z,ZK are based on Java ims, Dynamic prog KZ pose the big proble	titions, binary sively and 6 s. Grammars 6 lations and graphics. 6 a. Basic data gramming. 6 em, how to
B4B01DMA In this course stude relations, mappin B4B01JAG Basic notions of the B4B01NUM The course introdusystems of linear B4B33ALG In the course, the artypes a data struct B4B33RPH The main motivatidefine interfaces, i	Discrete Mathematics Into meet some important topics from the field of discrete mathematics. Namely, they will explore divisibility and calculations modulo n, gs, cardinality of sets, induction, and recurrence equations. The second aim of this course is to teach students the language of math actively, and introduce them to mathematics as science. Languages, Automats and Gramatics theory of finite automata and grammars: deterministic and non deterministic finite automata, languages accepted by finite automata, reand languages generated by grammars with emphasis to context free grammars. A very brief introduction of Turing machine Numerical Analysis Loces to basic numerical methods of interpolation and approximation of functions, numerical differentiation and integration, solution of requations. Emphasis is put on estimation of errors, practical skills with the methods and demonstration of their properties using Mathematics. Algorithms Igorithms development is constructed with minimum dependency to programming language; nevertheless the lectures and seminars actures, basic algorithms, recursive functions, abstract data types, stack, queues, trees, searching, sorting, special application algorithms to deal with real-world problems and construct non-trivial algorithms and to evaluate their effectivity. Solving Problems and other Games on is to let students to deal with real-world problems properly. When working on real problems the student skills. And many pro-	Z,ZK diophantine equa ematics, both pas Z,ZK egular expressions is. Z,ZK transcendent equ ple and computer Z,ZK are based on Java ims, Dynamic prog KZ pose the big proble blem will not be so	titions, binary sively and 6 s. Grammars 6 lations and graphics. 6 a. Basic data gramming. 6 em, how to obved in the
B4B01DMA In this course stude relations, mappin B4B01JAG Basic notions of the B4B01NUM The course introde systems of linear B4B33ALG In the course, the a types a data struct B4B33RPH The main motivati define interfaces, I optimal way. The	Discrete Mathematics Ints meet some important topics from the field of discrete mathematics. Namely, they will explore divisibility and calculations modulo now, gs, cardinality of sets, induction, and recurrence equations. The second aim of this course is to teach students the language of mathematical particles and introduce them to mathematics as science. Languages, Automats and Gramatics Theory of finite automata and grammars: deterministic and non deterministic finite automata, languages accepted by finite automata, reand languages generated by grammars with emphasis to context free grammars. A very brief introduction of Turing machine Numerical Analysis Loces to basic numerical methods of interpolation and approximation of functions, numerical differentiation and integration, solution of requations. Emphasis is put on estimation of errors, practical skills with the methods and demonstration of their properties using Ma Algorithms Igorithms Igorithms Igorithms development is constructed with minimum dependency to programming language; nevertheless the lectures and seminars stures, basic algorithms, recursive functions, abstract data types, stack, queues, trees, searching, sorting, special application algorithms are able to design and construct non-trivial algorithms and to evaluate their effectivity. Solving Problems and other Games on is to let students to deal with real-world problems properly. When working on real problems the student shall learn how to decomposite the students and students to study difficult theoretical subjects. They should generate the important questions. Idea and services are should motivate the students to study difficult theoretical subjects. They should generate the important questions. Idea and services are should motivate the students to study difficult theoretical subjects. They should generate the important questions. Idea and services are students to study difficult theoretical subjects. They should generate the important questions.	Z,ZK diophantine equa ematics, both pas Z,ZK egular expressions is. Z,ZK transcendent equ ple and computer Z,ZK are based on Java ims, Dynamic prog KZ pose the big proble blem will not be so ally, at the end of the	titions, binary sively and 6 s. Grammars 6 lations and graphics. 6 a. Basic data gramming. 6 em, how to olved in the he subject,
B4B01DMA In this course stude relations, mappin B4B01JAG Basic notions of the B4B01NUM The course introde systems of linear B4B33ALG In the course, the a types a data struct B4B33RPH The main motivati define interfaces, I optimal way. The	Discrete Mathematics Into meet some important topics from the field of discrete mathematics. Namely, they will explore divisibility and calculations modulo n, gs, cardinality of sets, induction, and recurrence equations. The second aim of this course is to teach students the language of math actively, and introduce them to mathematics as science. Languages, Automats and Gramatics theory of finite automata and grammars: deterministic and non deterministic finite automata, languages accepted by finite automata, reand languages generated by grammars with emphasis to context free grammars. A very brief introduction of Turing machine Numerical Analysis Loces to basic numerical methods of interpolation and approximation of functions, numerical differentiation and integration, solution of requations. Emphasis is put on estimation of errors, practical skills with the methods and demonstration of their properties using Mathematics. Algorithms Igorithms development is constructed with minimum dependency to programming language; nevertheless the lectures and seminars actures, basic algorithms, recursive functions, abstract data types, stack, queues, trees, searching, sorting, special application algorithms to deal with real-world problems and construct non-trivial algorithms and to evaluate their effectivity. Solving Problems and other Games on is to let students to deal with real-world problems properly. When working on real problems the student skills. And many pro-	Z,ZK diophantine equa ematics, both pas Z,ZK egular expressions is. Z,ZK transcendent equ ple and computer Z,ZK are based on Java ims, Dynamic prog KZ pose the big proble blem will not be so ally, at the end of the	titions, binary sively and 6 s. Grammars 6 lations and graphics. 6 a. Basic data gramming. 6 em, how to olved in the he subject,
B4B01DMA In this course stude relations, mappin B4B01JAG Basic notions of the B4B01NUM The course introde systems of linear B4B33ALG In the course, the al types a data struct B4B33RPH The main motivati define interfaces, i optimal way. The u the student should i	Discrete Mathematics Ints meet some important topics from the field of discrete mathematics. Namely, they will explore divisibility and calculations modulo in, gs, cardinality of sets, induction, and recurrence equations. The second aim of this course is to teach students the language of math actively, and introduce them to mathematics as science. Languages, Automats and Gramatics theory of finite automata and grammars: deterministic and non deterministic finite automata, languages accepted by finite automata, reand languages generated by grammars with emphasis to context free grammars. A very brief introduction of Turing machine Numerical Analysis Loces to basic numerical methods of interpolation and approximation of functions, numerical differentiation and integration, solution of requations. Emphasis is put on estimation of errors, practical skills with the methods and demonstration of their properties using Ma Algorithms Igorithms development is constructed with minimum dependency to programming language; nevertheless the lectures and seminars stures, basic algorithms, recursive functions, abstract data types, stack, queues, trees, searching, sorting, special application algorith Students are able to design and construct non-trivial algorithms and to evaluate their effectivity. Solving Problems and other Games on is to let students to deal with real-world problems properly. When working on real problems the student shall learn how to decomp one to test and validate individual steps and so on. Many problems will actually be beyond the first-year-student skills. And many proposed parts should motivate the students to study difficult theoretical subjects. They should generate the important questions. Idea are eager to study deeper about informatics. The course also explains the basis of the object oriented design, software testing, ways to codes.	Z,ZK diophantine equal ematics, both pass Z,ZK egular expressions is. Z,ZK transcendent equiple and computer Z,ZK are based on Java ims, Dynamic programs, Dynamic programs, Dynamic programs, are the big problem will not be so ally, at the end of the for writing readable.	titions, binary sively and 6 s. Grammars 6 sations and graphics. 6 a. Basic data gramming. 6 em, how to obved in the he subject, e and robust
B4B01DMA In this course stude relations, mappin B4B01JAG Basic notions of the B4B01NUM The course introdu systems of linear B4B33ALG In the course, the al types a data struct B4B33RPH The main motivati define interfaces, i optimal way. The u the student should I B4B33RPZ	Discrete Mathematics Ints meet some important topics from the field of discrete mathematics. Namely, they will explore divisibility and calculations modulo not get a calculation, and recurrence equations. The second aim of this course is to teach students the language of mathematics as science. Languages, Automats and Gramatics Theory of finite automata and grammars: deterministic and non deterministic finite automata, languages accepted by finite automata, reand languages generated by grammars with emphasis to context free grammars. A very brief introduction of Turing machine Numerical Analysis Loces to basic numerical methods of interpolation and approximation of functions, numerical differentiation and integration, solution of requations. Emphasis is put on estimation of errors, practical skills with the methods and demonstration of their properties using Machinematics. Algorithms Igorithms Igorithms development is constructed with minimum dependency to programming language; nevertheless the lectures and seminars stures, basic algorithms, recursive functions, abstract data types, stack, queues, trees, searching, sorting, special application algorithms are able to design and construct non-trivial algorithms and to evaluate their effectivity. Solving Problems and other Games on is to let students to deal with real-world problems properly. When working on real problems the student shall learn how to decomp one to test and validate individual steps and so on. Many problems will actually be beyond the first-year-student skills. And many proposed parts should motivate the students to study difficult theoretical subjects. They should generate the important questions. Idea are eager to study deeper about informatics. The course also explains the basis of the object oriented design, software testing, ways for the students of the object oriented design, software testing, ways for the object oriented design, software testing, ways for the object oriented design.	Z,ZK diophantine equal ematics, both pass Z,ZK egular expressions is. Z,ZK transcendent equiple and computer Z,ZK are based on Java ims, Dynamic programs, Dynamic programs, Dynamic programs, at the end of the tor writing readable Z,ZK	titions, binary sively and 6 s. Grammars 6 uations and graphics. 6 a. Basic data gramming. 6 em, how to obved in the he subject, e and robust
B4B01DMA In this course stude relations, mappin B4B01JAG Basic notions of the B4B01NUM The course introdusystems of linear B4B33ALG In the course, the aitypes a data struct B4B33RPH The main motivatidefine interfaces, toptimal way. The uthe student should the student should the student should the basic formulation.	Discrete Mathematics Ints meet some important topics from the field of discrete mathematics. Namely, they will explore divisibility and calculations modulo now, gs, cardinality of sets, induction, and recurrence equations. The second aim of this course is to teach students the language of mathematics as science. Languages, Automats and Gramatics theory of finite automata and grammars: deterministic and non deterministic finite automata, languages accepted by finite automata, reand languages generated by grammars with emphasis to context free grammars. A very brief introduction of Turing machine Numerical Analysis Loces to basic numerical methods of interpolation and approximation of functions, numerical differentiation and integration, solution of requations. Emphasis is put on estimation of errors, practical skills with the methods and demonstration of their properties using Ma Algorithms Igorithms development is constructed with minimum dependency to programming language; nevertheless the lectures and seminars stures, basic algorithms, recursive functions, abstract data types, stack, queues, trees, searching, sorting, special application algorithms and to evaluate their effectivity. Solving Problems and other Games on is to let students to deal with real-world problems properly. When working on real problems the student shall learn how to decompose test and validate individual steps and so on. Many problems will actually be beyond the first-year-student skills. And many prosense age ager to study deeper about informatics. The course also explains the basis of the object oriented design, software testing, ways to codes. Recognition and Machine Learning	Z,ZK diophantine equal ematics, both pass Z,ZK egular expressions is. Z,ZK transcendent equiple and computer Z,ZK are based on Java ims, Dynamic programs, Dynamic programs, Dynamic programs, at the end of the for writing readable in z,ZK inns and classes of	titions, binary sively and 6 s. Grammars 6 lations and graphics. 6 a. Basic data gramming. 6 em, how to obved in the he subject, e and robust 6 of objects is
B4B01DMA In this course stude relations, mappin B4B01JAG Basic notions of the B4B01NUM The course introde systems of linear B4B33ALG In the course, the al types a data struct B4B33RPH The main motivati define interfaces, i optimal way. The u the student should I B4B33RPZ The basic formulati acquired by learnin	Discrete Mathematics Ints meet some important topics from the field of discrete mathematics. Namely, they will explore divisibility and calculations modulo n, gs, cardinality of sets, induction, and recurrence equations. The second aim of this course is to teach students the language of math actively, and introduce them to mathematics as science. Languages, Automats and Gramatics theory of finite automata and grammars: deterministic and non deterministic finite automata, languages accepted by finite automata, re and languages generated by grammars with emphasis to context free grammars. A very brief introduction of Turing machine Numerical Analysis uces to basic numerical methods of interpolation and approximation of functions, numerical differentiation and integration, solution of requations. Emphasis is put on estimation of errors, practical skills with the methods and demonstration of their properties using Ma Algorithms gorithms development is constructed with minimum dependency to programming language; nevertheless the lectures and seminars actures, 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 on is to let students to deal with real-world problems properly. When working on real problems the student shall learn how to decomp now to test and validate individual steps and so on. Many problems will actually be beyond the first-year-student skills. And many prounsolved parts should motivate the students to study difficult theoretical subjects. They should generate the important questions. Idea are ager to study deeper about informatics. The course also explains the basis of the object oriented design, software testing, ways for codes. Recognition and Machine Learning ons of the statistical decision problem are presented. The necessary knowledge about the (statistical) relationship betwe	Z,ZK diophantine equal ematics, both passed and computer Z,ZK are based on Java arms, Dynamic programs, Dynamic programs, at the end of the for writing readable constants and classes of Support Vector Ma	titions, binary sively and 6 s. Grammars 6 sations and graphics. 6 a. Basic data gramming. 6 em, how to obved in the he subject, e and robust 6 of objects is chines, and
B4B01DMA In this course stude relations, mappin B4B01JAG Basic notions of the B4B01NUM The course introde systems of linear B4B33ALG In the course, the al types a data struct B4B33RPH The main motivati define interfaces, is optimal way. The u the student should in B4B33RPZ The basic formulati acquired by learnin Neural Nets. This of	Discrete Mathematics Into meet some important topics from the field of discrete mathematics. Namely, they will explore divisibility and calculations modulo n, gs, cardinality of sets, induction, and recurrence equations. The second aim of this course is to teach students the language of math actively, and introduce them to mathematics as science. Languages, Automats and Gramatics theory of finite automata and grammars: deterministic and non deterministic finite automata, languages accepted by finite automata, re and languages generated by grammars with emphasis to context free grammars. A very brief introduction of Turing machine Numerical Analysis Loces to basic numerical methods of interpolation and approximation of functions, numerical differentiation and integration, solution of requations. Emphasis is put on estimation of errors, practical skills with the methods and demonstration of their properties using Ma Algorithms Igorithms Igorithms development is constructed with minimum dependency to programming language; nevertheless the lectures and seminars stures, basic algorithms, recursive functions, abstract data types, stack, queues, trees, searching, sorting, special application algorith Students are able to design and construct non-trivial algorithms and to evaluate their effectivity. Solving Problems and other Games on is to let students to deal with real-world problems properly. When working on real problems the student shall learn how to decomp now to test and validate individual steps and so on. Many problems will actually be beyond the first-year-student skills. And many prounds to the study deeper about informatics. The course also explains the basis of the object oriented design, software testing, ways to codes. Recognition and Machine Learning ons of the statistical decision problem are presented. The necessary knowledge about the (statistical) relationship between observating on the raining set. The course covers both well-established and advanced classifier learning methods, as Perce	Z,ZK diophantine equal ematics, both pass Z,ZK egular expressions is. Z,ZK et transcendent equiple and computer Z,ZK are based on Java ams, Dynamic programs, Dynamic programs, Dynamic programs, at the end of the for writing readable in the end of the computer of the end o	titions, binary sively and 6 s. Grammars 6 lations and graphics. 6 a. Basic data gramming. 6 em, how to olved in the he subject, e and robust 6 of objects is chines, and ader insight
B4B01DMA In this course stude relations, mappin B4B01JAG Basic notions of the B4B01NUM The course introdusystems of linear B4B33ALG In the course, the aitypes a data struct B4B33RPH The main motivatif define interfaces, toptimal way. The uthe student should be supported by learning Neural Nets. This course basic formulating acquired by learning Neural Nets. This course basic formulating supports the student should be supported by learning Neural Nets. This course basic formulating supports the student should be supported by learning Neural Nets. This course students acquired by learning Neural Nets. This course students are supported by learning Neural Nets. This course supp	Discrete Mathematics Ints meet some important topics from the field of discrete mathematics. Namely, they will explore divisibility and calculations modulo n, gs, cardinality of sets, induction, and recurrence equations. The second aim of this course is to teach students the language of math actively, and introduce them to mathematics as science. Languages, Automats and Gramatics theory of finite automata and grammars: deterministic and non deterministic finite automata, languages accepted by finite automata, and languages generated by grammars with emphasis to context free grammars. A very brief introduction of Turing machine Numerical Analysis Loces to basic numerical methods of interpolation and approximation of functions, numerical differentiation and integration, solution of requations. Emphasis is put on estimation of errors, practical skills with the methods and demonstration of their properties using Ma Algorithms Igorithms development is constructed with minimum dependency to programming language; nevertheless the lectures and seminars stures, basic algorithms, recursive functions, abstract data types, stack, queues, trees, searching, sorting, special application algorith Students are able to design and construct non-trivial algorithms and to evaluate their effectivity. Solving Problems and other Games on is to let students to deal with real-world problems properly. When working on real problems the student shall learn how to decomp now to test and validate individual steps and so on. Many problems will actually be beyond the first-year-student skills. And many problems problem are prosented. The course also explains the basis of the object oriented design, software testing, ways foodes. Recognition and Machine Learning ons of the statistical decision problem are presented. The necessary knowledge about the (statistical) relationship between observate gon the raining set. The course covers both well-established and advanced classifier learning methods, as Perceptron, AdaBoost, Stourse is also	Z,ZK diophantine equal ematics, both passed and computer Z,ZK are based on Java arms, Dynamic programs, Dynamic programs, at the end of the for writing readable Z,ZK are bases of the big problem will not be so ally, at the end of the for writing readable Z,ZK are based on Java and Classes of the big problem will not be so ally, at the end of the forwriting readable Z,ZK are based on Z,ZK	titions, binary sively and 6 s. Grammars 6 lations and graphics. 6 a. Basic data gramming. 6 em, how to olved in the he subject, e and robust 6 of objects is chines, and ader insight
B4B01DMA In this course stude relations, mappin B4B01JAG Basic notions of the B4B01NUM The course introdusystems of linear B4B33ALG In the course, the aitypes a data struct B4B33RPH The main motivatif define interfaces, toptimal way. The uthe student should be stu	Discrete Mathematics Ints meet some important topics from the field of discrete mathematics. Namely, they will explore divisibility and calculations modulo n, gs, cardinality of sets, induction, and recurrence equations. The second aim of this course is to teach students the language of math actively, and introduce them to mathematics as science. Languages, Automats and Gramatics theory of finite automata and grammars: deterministic and non deterministic finite automata, languages accepted by finite automata, rand languages generated by grammars with emphasis to context free grammars. A very brief introduction of Turing machine Numerical Analysis Laces to basic numerical methods of interpolation and approximation of functions, numerical differentiation and integration, solution of requations. Emphasis is put on estimation of errors, practical skills with the methods and demonstration of their properties using Ma Algorithms Igorithms Igorithms development is constructed with minimum dependency to programming language; nevertheless the lectures and seminars stures, 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 on is to let students to deal with real-world problems properly. When working on real problems the student shall learn how to decomp now to test and validate individual steps and so on. Many problems will actually be beyond the first-year-student skills. And many promosolved parts should motivate the students to study difficult theoretical subjects. They should generate the important questions, Idea to eager to study deeper about informatics. The course also explains the basis of the object oriented design, software testing, ways to codes. Recognition and Machine Learning ons of the statistical decision problem are presented. The necessary knowledge about the (statistical) relation	Z,ZK diophantine equal ematics, both passes and classes of the standard representations are standard representations.	titions, binary sively and 6 s. Grammars 6 uations and graphics. 6 a. Basic data gramming. 6 em, how to olved in the he subject, e and robust 6 of objects is chines, and ader insight 4 asic security
B4B01DMA In this course stude relations, mappin B4B01JAG Basic notions of the B4B01NUM The course introdusystems of linear B4B33ALG In the course, the aitypes a data struct B4B33RPH The main motivatif define interfaces, toptimal way. The uthe student should be stu	Discrete Mathematics Ints meet some important topics from the field of discrete mathematics. Namely, they will explore divisibility and calculations modulo n, gs, cardinality of sets, induction, and recurrence equations. The second aim of this course is to teach students the language of math actively, and introduce them to mathematics as science. Languages, Automats and Gramatics theory of finite automata and grammars: deterministic and non deterministic finite automata, reand languages generated by grammars with emphasis to context free grammars. A very brief introduction of Turing machine Numerical Analysis Loces to basic numerical methods of interpolation and approximation of functions, numerical differentiation and integration, solution of requations. Emphasis is put on estimation of errors, practical skills with the methods and demonstration of their properties using Ma Algorithms Igorithms Igorithms development is constructed with minimum dependency to programming language; nevertheless the lectures and seminars stures, basic algorithms, recursive functions, abstract data types, stack, queues, trees, searching, sorting, special application algorith Students are able to design and construct non-trivial algorithms and to evaluate their effectivity. Solving Problems and other Games on is to let students to deal with real-world problems properly. When working on real problems the student shall learn how to decompose to test and validate individual steps and so on. Many problems will actually be beyond the first-year-student skills. And many propensional problems are students to study difficult theoretical subjects. They should generate the important questions. Idea to eager to study deeper about informatics. The course also explains the basis of the object oriented design, software testing, ways for the statistical decision problem are presented. The necessary knowledge about the (statistical) relationship between observating on the raining set. The course covers both well-established and advanced cl	Z,ZK diophantine equal ematics, both passes and classes of the standard representations are standard representations.	titions, binary sively and 6 s. Grammars 6 uations and graphics. 6 a. Basic data gramming. 6 em, how to olved in the he subject, e and robust 6 of objects is chines, and ader insight 4 asic security
B4B01DMA In this course stude relations, mappin B4B01JAG Basic notions of the B4B01NUM The course introdusystems of linear B4B33ALG In the course, the aitypes a data struct B4B33RPH The main motivatif define interfaces, toptimal way. The uthe student should be student should be student should be sayed. The basic formulatif acquired by learnin Neural Nets. This course aspects. These top	Discrete Mathematics Ints meet some important topics from the field of discrete mathematics. Namely, they will explore divisibility and calculations modulo n, gs, cardinality of sets, induction, and recurrence equations. The second aim of this course is to teach students the language of math actively, and introduce them to mathematics as science. Languages, Automats and Gramatics theory of finite automata and grammars: deterministic and non deterministic finite automata, languages accepted by finite automata, ra and languages generated by grammars with emphasis to context free grammars. A very brief introduction of Turing machine Numerical Analysis uces to basic numerical methods of interpolation and approximation of functions, numerical differentiation and integration, solution of requations. Emphasis is put on estimation of errors, practical skills with the methods and demonstration of their properties using Ma Algorithms gorithms development is constructed with minimum dependency to programming language; nevertheless the lectures and seminars extures, basic algorithms, recursive functions, abstract data types, stack, queues, trees, searching, sorting, special application algorith Students are able to design and construct non-trivial algorithms and to evaluate their effectivity. Solving Problems and other Games on is to let students to deal with real-world problems properly. When working on real problems the student shall learn how to decompose to test and validate individual steps and so on. Many problems will actually be beyond the first-year-student skills. And many promove to test and validate individual steps and so on. Many problems will actually be beyond the first-year-student skills. And many promove to test and validate individual steps and so on. Many problems will actually be beyond the first-year-student skills. And many promove to test and validate individual steps and so on. Many problems will actually be beyond the first-year-student skills. And many promove to test and validate indivi	Z,ZK diophantine equal ematics, both passed and computer Z,ZK are based on Javans, Dynamic programs, Dynamic programs, and classes of the big problem will not be so ally, at the end of the for writing readable Z,ZK are based on Javans, Dynamic programs, Dynamic programs, Dynamic programs, and classes of the big problem will not be so ally, at the end of the for writing readable Z,ZK are so and classes of the big problem of the computer of the	titions, binary sively and 6 s. Grammars 6 lations and graphics. 6 a. Basic data gramming. 6 em, how to olved in the he subject, e and robust 6 of objects is chines, and ader insight 4 asic security inguage will
B4B01DMA In this course stude relations, mappin B4B01JAG Basic notions of the B4B01NUM The course introdusystems of linear B4B33ALG In the course, the aitypes a data struct B4B33RPH The main motivatif define interfaces, toptimal way. The testudent should be student should be studen	Discrete Mathematics Into meet some important topics from the field of discrete mathematics. Namely, they will explore divisibility and calculations modulo n, gs, cardinality of sets, induction, and recurrence equations. The second aim of this course is to teach students the language of math actively, and introduce them to mathematics as science. Languages, Automats and Gramatics theory of finite automata and grammars: deterministic and non deterministic finite automata, languages accepted by finite automata, ra and languages generated by grammars with emphasis to context free grammars. A very brief introduction of Turing machine Numerical Analysis Loces to basic numerical methods of interpolation and approximation of functions, numerical differentiation and integration, solution of requations. Emphasis is put on estimation of errors, practical skills with the methods and demonstration of their properties using Ma Algorithms Igorithms Igorithms development is constructed with minimum dependency to programming language; nevertheless the lectures and seminars stures, basic algorithms, recursive functions, abstract data types, stack, queues, trees, searching, sorting, special application algorithms. Solving Problems and other Games on is to let students to deal with real-world problems properly. When working on real problems the student shall learn how to decompose to test and validate individual steps and so on. Many problems will actually be beyond the first-year-student skills. And many propensive parts should motivate the students to study difficult theoretical subjects. They should generate the important questions. Idea are ager to study deeper about informatics. The course also explains the basis of the object oriented design, software testing, ways foodes. Recognition and Machine Learning ons of the statistical decision problem are presented. The necessary knowledge about the (statistical) relationship between observating on the raining set. The course covers both well-established and advanced cl	Z,ZK diophantine equal ematics, both passed ematics, but the ematics of the emati	titions, binary sively and 6 s. Grammars 6 lations and graphics. 6 a. Basic data gramming. 6 em, how to olved in the he subject, e and robust 6 of objects is chines, and ader insight 4 lasic security inguage will 6
B4B01DMA In this course stude relations, mappin B4B01JAG Basic notions of the B4B01NUM The course introdusystems of linear B4B33ALG In the course, the aitypes a data struct B4B33RPH The main motivatif define interfaces, toptimal way. The uthe student should be stu	Discrete Mathematics Ints meet some important topics from the field of discrete mathematics. Namely, they will explore divisibility and calculations modulo n, gs, cardinality of sets, induction, and recurrence equations. The second aim of this course is to teach students the language of math actively, and introduce them to mathematics as science. Languages, Automats and Gramatics theory of finite automata and grammars: deterministic and non deterministic finite automata, languages accepted by finite automata, ra and languages generated by grammars with emphasis to context free grammars. A very brief introduction of Turing machine Numerical Analysis uces to basic numerical methods of interpolation and approximation of functions, numerical differentiation and integration, solution of requations. Emphasis is put on estimation of errors, practical skills with the methods and demonstration of their properties using Ma Algorithms gorithms development is constructed with minimum dependency to programming language; nevertheless the lectures and seminars extures, basic algorithms, recursive functions, abstract data types, stack, queues, trees, searching, sorting, special application algorith Students are able to design and construct non-trivial algorithms and to evaluate their effectivity. Solving Problems and other Games on is to let students to deal with real-world problems properly. When working on real problems the student shall learn how to decompose to test and validate individual steps and so on. Many problems will actually be beyond the first-year-student skills. And many promove to test and validate individual steps and so on. Many problems will actually be beyond the first-year-student skills. And many promove to test and validate individual steps and so on. Many problems will actually be beyond the first-year-student skills. And many promove to test and validate individual steps and so on. Many problems will actually be beyond the first-year-student skills. And many promove to test and validate indivi	Z,ZK diophantine equal ematics, both pass ematics, both pass Z,ZK egular expressions is. Z,ZK egular expressions is. Z,ZK transcendent equiple and computer Z,ZK are based on Java ims, Dynamic products is and computer in the second computer in the second computer is a second computer in the second computer in the second computer is a second computer in the second computer in the second computer is a second computer in the second computer in the second computer is a second computer in the second c	titions, binary sively and 6 s. Grammars 6 lations and graphics. 6 a. Basic data gramming. 6 em, how to olved in the he subject, e and robust 6 of objects is chines, and ader insight 4 asic security inguage will 6 his approach
B4B01DMA In this course stude relations, mappin B4B01JAG Basic notions of the B4B01NUM The course introdusystems of linear B4B33ALG In the course, the aitypes a data struct B4B33RPH The main motivatif define interfaces, toptimal way. The uthe student should be stu	Discrete Mathematics Into meet some important topics from the field of discrete mathematics. Namely, they will explore divisibility and calculations modulo n, gs, cardinality of sets, induction, and recurrence equations. The second aim of this course is to teach students the language of math actively, and introduce them to mathematics as science. Languages, Automats and Gramatics theory of finite automata and grammars: deterministic and non deterministic finite automata, languages accepted by finite automata, reand languages generated by grammars with emphasis to context free grammars. A very brief introduction of Turing machine Numerical Analysis Loses to basic numerical methods of interpolation and approximation of functions, numerical differentiation and integration, solution of requations. Emphasis is put on estimation of errors, practical skills with the methods and demonstration of their properties using Ma Algorithms Igorithms development is constructed with minimum dependency to programming language; nevertheless the lectures and seminars stures, basic algorithms, recursive functions, abstract data types, stack, queues, trees, searching, sorting, special application algorith Students are able to design and construct non-trivial algorithms and to evaluate their effectivity. Solving Problems and other Games on is to let students to deal with real-world problems properly. When working on real problems the student shall learn how to decomp one to test and validate individual steps and so on. Many problems will actually be beyond the first-year-student skills. And many promounds will actually be beyond the first-year-student skills. And many promounds will actually be beyond the first-year-student skills. And many promounds will actually be beyond the first-year-student skills. And many promounds will actually be beyond the first-year-student skills. And many promounds will actually be beyond the first-year-student skills. And many promounds will actually be beyond the first-year-student skills. And	Z,ZK diophantine equal ematics, both pase ematics, both pase Z,ZK egular expressions is. Z,ZK egular expressions is. Z,ZK transcendent equiple and computer Z,ZK are based on Java ims, Dynamic products is. KZ cose the big probleblem will not be so ally, at the end of the for writing readable if or writing readable is a deeper and brown a deeper and brown in a deeper and brown is given by the component in a deeper and brown in a deeper	titions, binary sively and 6 s. Grammars 6 lations and graphics. 6 a. Basic data gramming. 6 em, how to olved in the he subject, e and robust 6 of objects is chines, and ader insight 4 asic security anguage will 6 his approach e it. It allows
B4B01DMA In this course stude relations, mappin B4B01JAG Basic notions of the B4B01NUM The course introdusystems of linear B4B33ALG In the course, the aitypes a data struct B4B33RPH The main motivatif define interfaces, toptimal way. The uthe student should be supported by learning Neural Nets. This course introduces aspects. These top B4B36FUP This course introduce is declarative in the focusing on the es	Discrete Mathematics Its meet some important topics from the field of discrete mathematics. Namely, they will explore divisibility and calculations modulo n, gs, cardinality of sets, induction, and recurrence equations. The second aim of this course is to teach students the language of math actively, and introduce them to mathematics as science. Languages, Automats and Gramatics theory of finite automata and grammars: deterministic and non deterministic finite automata, languages accepted by finite automata, re and languages generated by grammars with emphasis to context free grammars. A very brief introduction of Turing machine Numerical Analysis Loces to basic numerical methods of interpolation and approximation of functions, numerical differentiation and integration, solution of requations. Emphasis is put on estimation of errors, practical skills with the methods and demonstration of their properties using Ma Algorithms (gorithms development is constructed with minimum dependency to programming language; nevertheless the lectures and seminars citures, basic algorithms, recursive functions, abstract data types, stack, queues, trees, searching, sorting, special application algorith Students are able to design and construct non-trivial algorithms and to evaluate their effectivity. Solving Problems and other Games on is to let students to deal with real-world problems properly. When working on real problems the student shall learn how to decomp now to test and validate individual steps and so on. Many problems will actually be beyond the first-year-student skills. And many promosolved parts should motivate the students to study difficult theoretical subjects. They should generate the important questions, idea are age to study deeper about informatics. The course also explains the basis of the object oriented design, software testing, ways to codes. Recognition and Machine Learning ons of the statistical decision problem are presented. The necessary knowledge about the (statistical) relationship betwee	Z,ZK diophantine equal ematics, both passes and classes of programming late and computer and com	titions, binary sively and 6 s. Grammars 6 lations and graphics. 6 a. Basic data gramming. 6 em, how to olved in the he subject, e and robust 6 of objects is chines, and ader insight 4 asic security anguage will 6 his approach e it. It allows lization and
B4B01DMA In this course stude relations, mappin B4B01JAG Basic notions of the B4B01NUM The course introdusystems of linear B4B33ALG In the course, the aitypes a data struct B4B33RPH The main motivatif define interfaces, toptimal way. The uthe student should interface the student should interface by learning Neural Nets. This course introduces aspects. These top B4B36FUP This course introduce is declarative in the focusing on the esautomated verification.	Discrete Mathematics Discrete Mathematics. Namely, they will explore divisibility and calculations modulo n, gs, cardinality of sets, induction, and recurrence equations. The second aim of this course is to teach students the language of math actively, and introduce them to mathematics as science. Languages, Automats and Gramatics theory of finite automata and grammars: deterministic and non deterministic finite automata, languages accepted by finite automata, ra and languages generated by grammars with emphasis to context free grammars. A very brief introduction of Turing machine Numerical Analysis Loss to basic numerical methods of interpolation and approximation of functions, numerical differentiation and integration, solution of requations. Emphasis is put on estimation of errors, practical skills with the methods and demonstration of their properties using Ma Algorithms Igorithms Igorithms development is constructed with minimum dependency to programming language; nevertheless the lectures and seminars stures, basic algorithms, recursive functions, abstract data types, stack, queues, trees, searching, sorting, special application algorithms. Students are able to design and construct non-trivial algorithms and to evaluate their effectivity. Solving Problems and other Games on is to let students to deal with real-world problems properly. When working on real problems the student skills and many prosence of the standard validate individual steps and so on. Many problems will actually be beyond the first-year-student skills. And many prosecuted the students to study difficult theoretical subjects. They should generate the important questions, loke the eager to study deeper about informatics. The course also explains the basis of the object oriented design, software testing, ways to codes. Recognition and Machine Learning ons of the statistical decision problem are presented. The necessary knowledge about the (statistical) relationship between observating on the raining set. The course covers both we	Z,ZK diophantine equal ematics, both passes. Z,ZK egular expressions is. Z,ZK etranscendent equal ple and computer Z,ZK are based on Java ims, Dynamic products. KZ cose the big probleblem will not be so ally, at the end of the for writing readable in a deeper and broducts. Z,ZK cs, file systems, base C programming lates in practice. The required to solventages for parallelinguages. Because	titions, binary sively and 6 s. Grammars 6 lations and graphics. 6 a. Basic data gramming. 6 em, how to olved in the he subject, e and robust 6 of objects is chines, and ader insight 4 asic security anguage will 6 his approach e it. It allows lization and e of the focus

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. B4B36PDV Parallel and Distributed Computing Z.ZK 6 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 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. B4B38PSIA Computer Networks Z.ZK 5 B4BPROJ6 6 Unassisted project Ζ BBAP20 Ζ 20 Bachelor thesis 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. BE4B35PSR Real-time Systems Programming Z.ZK 6 The goal of this course is to provide students with basic knowledge about software development for real-time systems, for example in control and embedded applications. The main focus is on embedded systems equipped with a real-time operating system (RTOS). Lectures will cover real-time systems theory, which can be used to formally verify timing correctness such systems. Another set of lectures will introduce methods and techniques used for development of safety-critical systems, whose failure may have catastrophic consequences. During labs, students will first solve a few simple tasks to familiarize them with basic components of VxWorks RTOS and to benchmark the used OS and hardware (Xilinx Zynq). The obtained metrics represent the typical criteria for assessing the suitability of a given platform for the given application. After the simple tasks, students will solve complex task of time-critical motion control application which will require full utilization of RTOS features. All the tasks at the labs will be implemented in C (or C++) language. BE4B36FUP 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. 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 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. BE4B38PSIA Computer Networks 7.7K 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. BE4B39VGO 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 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 6 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 Z.ZK 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. **BEZB** 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 Ζ 1 **TVKLV** Physical Education Course Ζ 0 TVKZV Physical Education Course

TVV	Physical education	Z	0
TVV0	Physical education	Z	0

For updated information see http://bilakniha.cvut.cz/en/FF.html Generated: day 2025-07-04, time 03:12.