## 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	<u> </u>	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	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 <b>Ji í Novák</b> 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, Viliam Lisý Branislav Bošanský (Gar.)  Real Introduction to Artificial Intelligence Branislav Bošanský Branislav Bošanský	Z,ZK	6	2P+2C	L	Р
BE5B35LSP	Logic Systems and Processors Richard Šusta, 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 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=2015_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

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.

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 74

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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
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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 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:

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Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
B0B16ET1	Ethic 1 Vladimír Sláme ka Vladimír Sláme ka Vladimír Sláme ka (Gar.)	KZ	4	2P+2C	Z	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 (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 i	s to provide the students an orientation not only in general problems of ethics but above all to offer instruction	s for solving various situations of hun	an life. Essential
parts of the subject	are discussions in which students can react to lectures but also to actual questions coming with news and lo	ook for the communal answers.	
B0B16FIL	Philosophy	ZK	2
We deal with the m	ost important persons, schools and ideas of ancient philosophy. We are concerned especially on transdiscipli	inary nature of philosophy and conne	ction of old
philosophical thoug	hts with recent problems of science, technology, economics and politics.		
B0B16FI1	Philosophy 1	KZ	4
We deal with the m	ost important persons, schools and ideas of ancient philosophy. We are concerned especially on transdiscipli	inary nature of philosophy and conne	ction of old
philosophical thoug	hts with recent problems of science, technology, economics and politics.		
B0B16HTE	History of technology and economic	ZK	2
B0B16HT1	History of science and technology 1	KZ	4
B0B16HI1	History 1	KZ	4
B0B16MPS	Psychology	Z,ZK	4
B0B16MPL	Psychology for managers	ZK	2
A003TV	Physical Education	7	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:

B0B01MA1

B0B01MA2

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 Daniel Pr ša, Robert P ni ka Daniel Pr ša Daniel Pr ša (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
30B36DBS	Database Systems Martin imná , Václav Kratochvíl <b>Martin imná</b> Martin imná (Gar.)	Z,ZK	6	2P+2C+4D	L	Р
34B01DMA	Discrete Mathematics Petr Habala Petr Habala (Gar.)	Z,ZK	5	2P+2S	Z	Р
30B01LAG	Linear Algebra Daniel Gromada, Ji í Velebil, Jakub Rondoš, Natalie Žukovec, Mat j Dostál Ji í Velebil Ji í Velebil (Gar.)	Z,ZK	8	4P+2S	Z	Р
30B01LGR	Logic and Graphs Natalie Žukovec, Mat j Dostál, Alena Gollová Mat j Dostál Marie Demlová (Gar.)	Z,ZK	5	3P+2S	Z,L	Р
30B01MA1	Mathematical Analysis 1 Martin K epela, Josef Tkadlec, Josef Dvo ák, Veronika Sobotíková Josef Tkadlec Josef Tkadlec (Gar.)	Z,ZK	7	4P+2S	Z,L	Р
80B01MA2	Mathematical Analysis 2 Martin Bohata, Miroslav Korbelá, Petr Hájek, Jaroslav Tišer, Karel Pospíšil, Paola Vivi, Hana Tur inová Martin Bohata Jaroslav Tišer (Gar.)	Z,ZK	7	4P+2S	L,Z	Р
34B35OSY	Operating Systems Michal Sojka, Petr Št pán Michal Sojka Michal Sojka (Gar.)	Z,ZK	4	2P+2C	Z	Р
30B33OPT	Optimization Tomáš Werner, Petr Olšák, Mirko Navara, Tomáš Kroupa Tomáš Kroupa Tomáš Werner (Gar.)	Z,ZK	7	4P+2C	Z,L	Р
34B36PDV	Parallel and Distributed Computing Mat j Kafka, Michal Jakob Michal Jakob (Gar.)	Z,ZK	6	2P+2C	L	Р
34B38PSIA	Computer Networks Ji í Novák, Jan Holub <b>Ji í Novák</b> Ji í Novák (Gar.)	Z,ZK	5	2P+2L	L	Р
30B01PST	Probability and Statistics Kate ina Helisová, Jakub Stan k Kate ina Helisová Kate ina Helisová (Gar.)	Z,ZK	7	4P+2S	Z	Р
30B36PRP	Procedural Programming Jan Faigl Jan Faigl (Gar.)	Z,ZK	6	2P+2C	Z	Р
BOB36PJV	Programming in Java Ji í Vok ínek, Martin Mudroch, Ladislav Serédi <b>Ji í Vok ínek</b> Ji í Vok ínek (Gar.)	Z,ZK	6	2P+3C+7D	L	Р
34B33RPH	Solving Problems and other Games Tomáš Svoboda, Petr Pošík Petr Pošík Tomáš Svoboda (Gar.)	KZ	6	2P+3C	Z	Р
34BPROJ6	Unassisted project Tomáš Svoboda, Petr Pošík, Ji í Šebek, Jaroslav Sloup, Ivan Jelínek, Katarína Žmolíková Jaroslav Sloup	Z	6	0+2	Z,L	Р

B4B33ALG Algorithms Z,ZK In the course, the algorithms development is constructed with minimum dependency to programming language; nevertheless the lectures and seminars 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, Dynamic programming. 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 for data definition 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, database system architecture and their management. They will verify their knowledge during the elaboration of a continuously submitted seminar task. B4B01DMA Discrete Mathematics Z,ZK In this course students meet some important topics from the field of discrete mathematics. Namely, they will explore divisibility and calculations modulo n, diophantine equations, binary relations, mappings, cardinality of sets, induction, and recurrence equations. The second aim of this course is to teach students the language of mathematics, both passively and actively, and introduce them to mathematics as science. B0B01LAG Linear Algebra Z,ZK The course covers the initial parts of linear algebra. Firstly, the basic notions of a linear space and linear mappings are covered (linear dependence and independence, basis, coordinates, etc). The calculus of matrices (determinants, inverse matrices, matrices of a linear map, eigenvalues and eigenvectors, diagonalisation, etc) is covered next. The applications include solving systems of linear equations, the geometry of a 3D space (including the scalar product and the vector product) and SVD. B0B01LGR Logic 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 importance of the notion of consequence

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

Z,ZK

 $Z, \overline{ZK}$ 

7

and of the relationship between a formula and its model is stressed. Further, basic notions from graph theory are introduced.

The aim of the course is to introduce students to basics of differential and integral calculus of functions of one variable.

Mathematical Analysis 1

Mathematical Analysis 2

series and power series with application to Taylor and Fourier series.

B4B35OSY Operating Systems Z,ZK 4

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 Optimization Z,ZK 7

The course provides an introduction to mathematical optimization, specifically to optimization in real vector spaces of finite dimension. The theory is 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	Probability and Statistics	Z,ZK	7
B0B36PRP	Procedural Programming	Z,ZK	6

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

Z,ZK

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

ΚZ

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

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

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 to 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	PO
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

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 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. B4B01JAG Languages, Automats and Gramatics

Z,ZK

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

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

B4B33RPZ Recognition and Machine Learning

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

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.

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 Petra Juna Jennings Petra Juna Jennings (Gar.)	Z	3	2C	Z,L	V

	of the courses of this group of Study Plan: Code=2015_BJKA Name=English language cour	000	
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.	•	•
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 Engli	sh language.
B0B04B11	English Language B1-1	Z	0
Course objective: Broa	adening the basic knowledge of general English; mastering basic specialised language; focusing on text analysis and vocabulary	expansion; under	standing spoker
English.			
B0B04B12	English Language B1-2	Z	0
Course objective: Broa	adening the basic knowledge of general English; mastering basic specialised language; focusing on text analysis and vocabulary	expansion; under	standing spoker
			3 -1
English.			3 17 1
English. B0B04B21	English Language B2-1	Z	3
B0B04B21		Z	3
B0B04B21 This course is designed the course is focused	English Language B2-1 ed as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mar	Z B2 - zkouška - B0 k), it also focuses	3 B04B2Z*). While more on the
B0B04B21 This course is designed the course is focused academic and technic	English Language B2-1  d as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk	Z B2 - zkouška - B0 k), it also focuses	3 B04B2Z*). While more on the
B0B04B21 This course is designed the course is focused	English Language B2-1 ed as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mar	Z B2 - zkouška - B0 k), it also focuses	3 B04B2Z*). While more on the
B0B04B21 This course is designed the course is focused academic and technic	English Language B2-1 ed as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mar	Z B2 - zkouška - B0 k), it also focuses	3 B04B2Z*). While more on the
B0B04B21 This course is designed the course is focused academic and technic / International Study. B0B04B22	English Language B2-1 ed as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mar al vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appro-	Z B2 - zkouška - B0 k), it also focuses ppriate level of Eng	3 B04B2Z*). While more on the glish for Erasmus
B0B04B21 This course is designed the course is focused academic and technic / International Study. B0B04B22 This course is designed	English Language B2-1 ed as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mar al vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appro  English Language B2-2	Z B2 - zkouška - B0 k), it also focuses priate level of Eng  Z B2 - zkouška - B0	3 B04B2Z*). While more on the glish for Erasmus 3 304B2Z *). While
B0B04B21 This course is designed the course is focused academic and technic / International Study. B0B04B22 This course is designed the course is focused	English Language B2-1 ed as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mar al vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appro  English Language B2-2 ed as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk I	Z B2 - zkouška - B0 k), it also focuses priate level of Eng Z B2 - zkouška - B0l k), it also focuses	3 B04B2Z*). While more on the glish for Erasmus  3 304B2Z *). While 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
TV-V1	Physical education	Z	1	0+2	Z,L	V
TVV0	Physical education	Z	0	0+2	Z,L	V

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

TVV	Physical education	Z	0
TV-V1	Physical education	Z	1
TVV0	Physical education	Z	0

Code of the group: BTVK

Name of the group: Physical education courses

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

Credits in the group: 0

Note on the group:

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

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

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

Code of the group: 2015\_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 course covers	the initial parts of linear algebra. Firstly, the basic notions of a linear space and linear mappings are covered (linear dependence and indep	endence, basis,	coordinates
etc). The calculus	of matrices (determinants, inverse matrices, matrices of a linear map, eigenvalues and eigenvectors, diagonalisation, etc) is covered no solving systems of linear equations, the geometry of a 3D space (including the scalar product and the vector product) and SVI		ons include
B0B01LGR	Logic and Graphs	Z,ZK	5
	basics of mathematical logic and graph theory. Syntax and semantics of propositional and predicate logic are introduced. The importance	•	
11113 000130 004013	and of the relationship between a formula and its model is stressed. Further, basic notions from graph theory are introduced.		onsequence
B0B01MA1	Mathematical Analysis 1  The aim of the course is to introduce students to basics of differential and integral calculus of functions of one variable.	Z,ZK	7
B0B01MA2	Mathematical Analysis 2	Z,ZK	7
The subject cove	rs an introduction to the differential and integral calculus in several variables and basic relations between curve and surface integrals. C series and power series with application to Taylor and Fourier series.		ns function
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 English	glish.	
B0B04A22	English Language A2-2	Z	0
The course is op	en to students who are beginners in their second foreign language. The course objective is to develop and sustain their basic knowledge	ge of the English	language.
B0B04B11	English Language B1-1	Z	0
Course objective: E	oroadening the basic knowledge of general English; mastering basic specialised language; focusing on text analysis and vocabulary expa English.	nsion; understan	ding spoker
B0B04B12	English Language B1-2	Z	0
Course objective: E	Broadening the basic knowledge of general English; mastering basic specialised language; focusing on text analysis and vocabulary expa	nsion; understan	ding spoker
	English.		
B0B04B1K	English language B1 - classified assessment	127	0
DODO-D IIX		KZ	Ū
B0B04B21 This course is desi the course is foc	verifying of the student's skills of B1 level  English Language B2-1 gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - z used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), i	Z zkouška - B0B04l it also focuses mo	3 32Z*). While ore on the
B0B04B21 This course is desi the course is foc	verifying of the student's skills of B1 level  English Language B2-1 gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - z	Z zkouška - B0B04l it also focuses mo	3 32Z*). While ore on the
B0B04B21 This course is desi the course is foc	verifying of the student's skills of B1 level  English Language B2-1  gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - z used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), i inical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriate / International Study.	Z zkouška - B0B04l it also focuses mo	3 32Z*). While ore on the
B0B04B21 This course is desi the course is foc academic and tech	verifying of the student's skills of B1 level  English Language B2-1  gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - z used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), i inical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriate	Z zkouška - B0B04ł it also focuses m e level of English Z	3 32Z*). While ore on the for Erasmu
B0B04B21 This course is desi the course is foc academic and tech B0B04B22 This course is desi the course is foc	verifying of the student's skills of B1 level  English Language B2-1  gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - z used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), i inical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriate / International Study.  English Language B2-2  gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - z used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), i	Z zkouška - B0B04f it also focuses m e level of English Z kouška - B0B04E it also focuses m	3 32Z*). Whill ore on the for Erasmu  3 32Z *). Whill ore on the
B0B04B21 This course is desi the course is foc academic and tech B0B04B22 This course is desi the course is foc	verifying of the student's skills of B1 level  English Language B2-1 gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - z used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), i inical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriate / International Study.  English Language B2-2 gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - z used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), i inical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriate	Z zkouška - B0B04f it also focuses m e level of English Z kouška - B0B04E it also focuses m	3 32Z*). While on the for Erasmu  3 32Z *). While on the
B0B04B21 This course is desi the course is foc academic and tech B0B04B22 This course is desi the course is foc academic and tech	verifying of the student's skills of B1 level  English Language B2-1 gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - z used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), i inical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriate / International Study.  English Language B2-2 gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - z used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), i inical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriate / International Study.	Z zkouška - B0B04l it also focuses me e level of English Z kouška - B0B04E it also focuses me e level of English	3 32Z*). While ore on the for Erasmus 3 32Z *). While ore on the for Erasmus
B0B04B21 This course is desi the course is foc academic and tech B0B04B22 This course is desi the course is foc academic and tech B0B04B2Z	verifying of the student's skills of B1 level  English Language B2-1 gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - z used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), i inical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriate / International Study.  English Language B2-2 gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - z used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), i inical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriate / International Study.  English language B2 - exam	Z  zkouška - B0B04l  it also focuses me e level of English  Z  kouška - B0B04l  it also focuses me e level of English	3 32Z*). While ore on the for Erasmus 3 32Z *). While ore on the for Erasmus
B0B04B21 This course is desi the course is foc academic and tech  B0B04B22 This course is desi the course is foc academic and tech  B0B04B2Z I) The B2 English E	verifying of the student's skills of B1 level  English Language B2-1 gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - z used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), i inical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriate / International Study.  English Language B2-2 gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - z used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), i inical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriate / International Study.  English language B2 - exam Exam is a compulsory subject for all Faculty of Electrical Engineering students at the Czech Technical University. According to the Study	Z  zkouška - B0B04l  it also focuses me e level of English  Z  kouška - B0B04l  it also focuses me e level of English  Z,ZK  v and Examinatio	3 32Z*). While ore on the for Erasmus 3 32Z *). While ore on the for Erasmus 0 n Rules and
B0B04B21 This course is desi the course is foc academic and tech  B0B04B22 This course is desi the course is foc academic and tech  B0B04B2Z I) The B2 English E Regulations for Stu	verifying of the student's skills of B1 level  English Language B2-1 gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - z used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), i inical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriate / International Study.  English Language B2-2 gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - z used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), i inical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriate / International Study.  English language B2 - exam	Z  zkouška - B0B04l  it also focuses me e level of English  Z  kouška - B0B04l  it also focuses me e level of English  Z,ZK  v and Examinatio elete the study pro	3 32Z*). While ore on the for Erasmus 3 32Z *). While ore on the for Erasmus 0 n Rules and ogramme. Ir
B0B04B21 This course is desi the course is foc academic and tech B0B04B22 This course is desi the course is foc academic and tech B0B04B2Z I) The B2 English E Regulations for Stu addition, this require	verifying of the student's skills of B1 level  English Language B2-1 gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - z used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), i inical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriate / International Study.  English Language B2-2 gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - z used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), i inical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriate / International Study.  English language B2 - exam Exam is a compulsory subject for all Faculty of Electrical Engineering students at the Czech Technical University. According to the Study udents at CTU (Part III, Article 4), a compulsory subject is one whose completion is a necessary condition in order to successfully comp	Z  kouška - B0B04E  it also focuses me e level of English  Z  kouška - B0B04E  it also focuses me e level of English  Z,ZK  v and Examinatio elete the study pro ean Framework of	3 32Z*). While ore on the for Erasmus 3 32Z *). While ore on the for Erasmus 0 n Rules and ogramme. In f Reference
B0B04B21 This course is desi the course is foc academic and tech B0B04B22 This course is desi the course is foc academic and tech B0B04B2Z D1) The B2 English ERegulations for Straddition, this require for Languages (CI	verifying of the student's skills of B1 level  English Language B2-1 gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - z used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), i inical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriate / International Study.  English Language B2-2 gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - z used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), i inical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriate / International Study.  English language B2 - exam  Exam is a compulsory subject for all Faculty of Electrical Engineering students at the Czech Technical University. According to the Study udents at CTU (Part III, Article 4), a compulsory subject is one whose completion is a necessary condition in order to successfully compares 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 Europe	Z  zkouška - B0B044  it also focuses me e level of English  Z  kouška - B0B048  it also focuses me e level of English  Z,ZK  v and Examinatio elete the study pro ean Framework of  Upper-Intermedi	3 32Z*). While pre on the for Erasmus 3 2Z *). While pre on the for Erasmus  0 n Rules and pgramme. It f Reference ate) level is
B0B04B21 This course is desi the course is foc academic and tech B0B04B22 This course is desi the course is foc academic and tech B0B04B2Z I) The B2 English E Regulations for Stu addition, this requir for Languages (Cl one who can under of fluency and spor	Partifying of the student's skills of B1 level  English Language B2-1 gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - z used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), inical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriate / International Study.  English Language B2-2 gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - z used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), inical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriate / International Study.  English language B2 - exam  Exam is a compulsory subject for all Faculty of Electrical Engineering students at the Czech Technical University. According to the Study udents at CTU (Part III, Article 4), a compulsory subject is one whose completion is a necessary condition in order to successfully compares 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 Europe EFR), an international standard for describing language ability, the definition of an English language learner who has achieved the B2 (extend the main ideas of complex text on both concrete and abstract topics, including technical discussions in his/her field of specialisation traneity that makes regular interaction with native speakers quite possible without strain for either party. Can produce clear, detailed tex	Z kouška - B0B04t it also focuses me e level of English  Z kouška - B0B04E it also focuses me e level of English  Z,ZK v and Examinatio elete the study pro ean Framework of Upper-Intermedia on. Can interact w t on a wide range	3 32Z*). While ore on the for Erasmu  3 2Z *). While ore on the for Erasmu  0 n Rules and ogramme. In f Reference ate) level is ith a degree e of subject
B0B04B21 This course is desi the course is foc academic and tech B0B04B22 This course is desi the course is foc academic and tech B0B04B2Z I) The B2 English E Regulations for Stu addition, this requir for Languages (Cl one who can under of fluency and sport and explain a view	verifying of the student's skills of B1 level  English Language B2-1  gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - z used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), i inical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriate / International Study.  English Language B2-2  gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - z used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), i inical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriate / International Study.  English language B2 - exam  Exam is a compulsory subject for all Faculty of Electrical Engineering students at the Czech Technical University. According to the Study udents at CTU (Part III, Article 4), a compulsory subject is one whose completion is a necessary condition in order to successfully compres 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 Europe EFR), an international standard for describing language ability, the definition of an English language learner who has achieved the B2 (estand the main ideas of complex text on both concrete and abstract topics, including technical discussions in his/her field of specialisation traneity that makes regular interaction with native speakers quite possible without strain for either party. Can produce clear, detailed text woont on a topical issue giving the advantages and disadvantages of various options. III) Students who have successfully passed an a	Z kouška - B0B04t it also focuses me e level of English  Z kouška - B0B04E it also focuses me e level of English  Z,ZK  / and Examinatio elete the study pro ean Framework of Upper-Intermedian. Can interact we t on a wide range	3 322*). While ore on the for Erasmus 3 22 *). While ore on the for Erasmus 0 n Rules and ogramme. In f Reference ate) level is ith a degree of subjects onal exam
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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
	is an introduction to mathematical optimization, specifically to optimization in real vector spaces of finite dimension. The theory is illustrate		of example
	You will refresh and extend many topics that you know from linear algebra and calculus courses.		
B0B35APO	Computer Architectures	Z,ZK	5
B0B36DBS	Database Systems	Z,ZK	6
	gned as a basic database course mainly aimed at the student ability to design a relational data model and to use the SQL language fo		
data querying and	I to choose the appropriate degree of transaction isolation. Students will also get acquainted with the most commonly used indexing te architecture and their management. They will verify their knowledge during the elaboration of a continuously submitted seminar to	=	ase system
B0B36PJV	Programming in Java	Z,ZK	6
	on the basics of algorithms and programming from the first semester and introduces students to the Java environment. The course also		
f the Java languag	ge. The topics of the course includes exceptions, event handling, and building a graphical interface. Basic library methods, working with	files and using	generic type
	An important topic is models of multithreaded applications and their implementation. Practical exercises of practical skills and knowledg		
solving partial ta	isks and semester work, which will be submitted continuously through the source code version control system. The semester work sco correctness and efficiency of the code, as well as points that take into account the quality of the source codes, their readability and re	-	points for th
B0B36PRP	Procedural Programming	Z,ZK	6
	panies basic programming emphasizing the data representation in computer memory. Furthermore, the concepts of linked data structure	•	_
	Students master the practical implementation of simple individual tasks. The course emphasizes acquiring programming habits for crea	-	
ograms. At the sa	me time, the effort is to build students an overview of the program operation, data model, memory access, and management. Therefore,	the C programm	ing languaç
· · · · · · · · · · · · · · · · · · ·	es a direct link between the program data structures and their representation in the computer memory. Students will get acquainted not constitute the constitution of		-
_	with debugging and profiling. Labs aim to acquire practical skills of implementing simple individual tasks, emphasizing functionality and	-	
•	dence is developed by a set of homework with the possibility of optional and bonus assignments. The final task is an integration of a la plementations. Evaluation of coding style motivated by writing legible, understandable, and maintainable codes is also a part of the se		ırıy existing
B4B01DMA	Discrete Mathematics	Z,ZK	5
	ents meet some important topics from the field of discrete mathematics. Namely, they will explore divisibility and calculations modulo n, or		_
	ngs, cardinality of sets, induction, and recurrence equations. The second aim of this course is to teach students the language of mathe		
	actively, and introduce them to mathematics as science.		1
B4B01JAG	Languages, Automats and Gramatics	Z,ZK	6
asic notions of the	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 machines		is. Gramma
B4B01NUM		z,zk	6
	Numerical Analysis    luces to basic numerical methods of interpolation and approximation of functions, numerical differentiation and integration, solution of t	•	-
	ar equations. Emphasis is put on estimation of errors, practical skills with the methods and demonstration of their properties using Map	-	
B4B33ALG	Algorithms	Z,ZK	6
	1		
n the course, the a	algorithms development is constructed with minimum dependency to programming language; nevertheless the lectures and seminars a	,	
	ctures, basic algorithms, recursive functions, abstract data types, stack, queues, trees, searching, sorting, special application algorithm	re based on Jav	a. Basic da
types a data stru	ctures, basic algorithms, recursive functions, abstract data types, stack, queues, trees, searching, sorting, special application algorithm Students are able to design and construct non-trivial algorithms and to evaluate their effectivity.	re based on Jav	ra. Basic dat ogramming.
types a data stru B4B33RPH	ctures, basic algorithms, recursive functions, abstract data types, stack, queues, trees, searching, sorting, special application algorithm Students are able to design and construct non-trivial algorithms and to evaluate their effectivity.  Solving Problems and other Games	re based on Jav ns, Dynamic pro KZ	ra. Basic date ogramming.
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BBAP20	Bachelor thesis	Z	20
BE4B33SEA	Subject in english - abroad  The subject serves for validation of the duty to complete at least one compulsory course of the program in English.	Z,ZK	0
BE4B35PSR	Real-time Systems Programming	Z,ZK	6
_	ourse is to provide students with basic knowledge about software development for real-time systems, for example in control and embeds		
	ed systems equipped with a real-time operating system (RTOS). Lectures will cover real-time systems theory, which can be used to for		
·=	other set of lectures will introduce methods and techniques used for development of safety-critical systems, whose failure may have		-
•	nts will first solve a few simple tasks to familiarize them with basic components of VxWorks RTOS and to benchmark the used OS an	•	
	s represent the typical criteria for assessing the suitability of a given platform for the given application. After the simple tasks, student	•	x task of
	itical motion control application which will require full utilization of RTOS features. All the tasks at the labs will be implemented in C (or		
BE4B36FUP	Functional Programming	Z,ZK	6
	ces students into the techniques of functional programming, the advantages and disadvantages of this programming paradigm, and its	•	
	sense that the programmer symbolically describes the problem to be solved, rather than specifying the exact sequence of operation	-	
	sence of the solved problem and implementing even more complex algorithms compactly. Functional programming has notable adva		
	on of algorithms, and the most useful functional programming concepts are increasingly often introduced to standard programming la		
· -	mming on symbols, rather than numbers, functional programming has been heavily used in in artificial intelligence fields, such as agen se 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 d		
earning. This cour	the field of artificial intelligence. More information is available at https://prg.ai/minor.	seper and broader	irisigiit iritt
REARSEZI II		Z,ZK	6
BE4B36ZUI	Introduction to Artificial Intelligence se is to cover the basics of symbolic artificial intelligence. We will focus on algorithms of informed and uninformed state space searc		1
	ation of knowledge using formal logic, methods of automated reasoning, and an introduction to Markov decision making, and to two-		
	nter-university programme prg.ai Minor. It pools the best of AI education in Prague to provide students with a deeper and broader ins		
aloo part of tho	intelligence. More information is available at https://prg.ai/minor.	igni into tro nota c	- artinolar
BE4B38PSIA	Computer Networks	Z,ZK	5
	to principles and technologies of Computer Networks. Physical layer media, analog and digital modulations, network topologies, MA	1	1
-	on models, coding and cryptography basics are introduced. Widely used LAN technologies are then presented together with their fea		-
aata communicat	explained and internetworking approaches are presented.	2.0.00oo. p. 0	100010 010
BE4B39VGO	Creating graphic content	Z,ZK	6
	urse is to provide theory behind geometric modeling and modeling of materials, give students an overview of methods used in the pr		_
	p apply those methods in praxis. At the seminars, students will learn how to design and create three-dimensional scene, create and ap	_	
9 P	(e.g., wall finishes, wood, sky) and geometrical details, and position and set-up lights in the scene.	p.,	· · · · · · · · · · · · · · · · · · ·
BE5B32PKS	Computer and Communication Networks	Z,ZK	6
	rse is to familiarize students with current trends in the switched local networks and the key functions of routing protocols in IP networ		_
	primarily practically then theoretically.		
BE5B33RPZ	Pattern Recognition and Machine Learning	Z,ZK	6
	ions of the statistical decision problem are presented. The necessary knowledge about the (statistical) relationship between observations of the statistical decision problem are presented.		_
	ng on the raining set. The course covers both well-established and advanced classifier learning methods, as Perceptron, AdaBoost, S		•
	course is also part of the inter-university programme prg.ai Minor. It pools the best of AI education in Prague to provide students with		
	into the field of artificial intelligence. More information is available at https://prg.ai/minor.	•	Ü
BE5B35APO	Computer Architectures	Z,ZK	6
	overview of basic building blocks of computer systems. Explanation starts from hardware side where it extends knowledge presente	1 '	_
	uter systems. Topics cover building blocks description, CPU structure, multiple processors interconnections, input/output subsystem	•	
and buses topolog	ies. Emphasis is placed on clarification of interconnection of hardware components with software support, mainly lower levels of ope	rating systems, de	vice drivers
and virtualization	techniques. General principles are more elaborated during presentation of examples of multiple standard CPU architectures. Exercis	ses are more focus	sed on the
	software view to the contrary. Students are lead from basic programming on CPU level to the interaction with raw hardware	∍.	
BE5B35LSP	Logic Systems and Processors	Z,ZK	6
	ces the basic hardware structures of computing resources, their design, and architecture. It provides an overview of the possibilities		operations
at the hardware leve	el and the design of embedded processor systems with peripherals on modern FPGA programmable logic circuits, which are increasing	gly widely used tod	ay. Students
will learn their desc	pription in VHDL, from logic to more complex sequential circuits to practical finite state machine (FSM) designs. They will also master	the correct design	n procedure
using circuit simula	ation. Practical problems are solved using development boards used at hundreds of leading universities around the world. The course	ends with RISC-\	/ processor
	structure, cache, and pipeline processing.		
BEZB	Safety in Electrical Engineering for a Bachelor's Degree	Z	0
The purpose of the	safety course is to give the students basic knowledge of electrical equipment and installation as to avoid danger arising from operatio	n of it. This introdu	ctory course
contains funda	mentals of Safety Electrical Engineering. In this way the students receive qualification of instructed person that enables them to world	k on electrical equ	pment.
BEZZ	Basic Health and Occupational Safety Regulations	Z	0
-	e worked out based on The Training Scheme for Health and Occupational Safety designed for employees and students of the Czech		-
which was provide	d by the Rector's Office of the CTU. Safety is considered one of the basic duties of all employees and students. The knowledge of He	ealth and Occupati	onal Safety
	regulations forms an integral and permanent part of qualification requirements. This program is obligatory.	1	
TV-V1	Physical education	Z	1
TVKLV	Physical Education Course	Z	0
TVKZV	Physical Education Course	Z	0
TVV	Physical education	Z	0
	i nyolodi oddodilon		<del>_</del>

For updated information see <a href="http://bilakniha.cvut.cz/en/FF.html">http://bilakniha.cvut.cz/en/FF.html</a> Generated: day 2025-11-05, time 20:28.

TVV0

Physical education