# Study plan

# Name of study plan: Open Informatics - Internet of Things 2016

Faculty/Institute/Others: Department: Branch of study guaranteed by the department: Welcome page 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 gro | μ.   |            |         |          |          |      |
|-----------------|--|------------|---------|----------|----------|------|
| Code            | Name of the course / Name of the group of courses<br>(in case of groups of courses the list of codes of their<br>members)<br>Tutors, authors and guarantors (gar.) | Completion | Credits | Scope    | Semester | Role |
| BE4B33SEA       | Subject in english - abroad<br>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<br>Pavel Píša, Richard Šusta Pavel Píša Pavel Píša (Gar.)   | Z,ZK       | 6       | 2P+2L    | L        | Р    |
| BE4B38PSIA      | Computer Networks<br>Ji í Novák, Jan Holub <b>Ji í Novák</b> Ji í Novák (Gar.)   | Z,ZK       | 5       | 2P+2L    | L        | Р    |
| BE4B36FUP       | Functional Programming<br>Rostislav Hor ík, Tomáš Votroubek Rostislav Hor ík Michal P chou ek<br>(Gar.)  | Z,ZK       | 6       | 2P+2C    | L        | Р    |
| BE4B36ZUI       | Introduction to Artificial Intelligence<br>Branislav Bošanský, Viliam Lisý Branislav Bošanský Branislav Bošanský<br>(Gar.)   | Z,ZK       | 6       | 2P+2C    | L        | Р    |
| BE5B35LSP       | Logic Systems and Processors<br>Richard Šusta, Martin Hlinovský Martin Hlinovský Richard Šusta (Gar.)  | Z,ZK       | 6       | 3P+2L    | Z        | Р    |
| BE5B33RPZ       | Pattern Recognition and Machine Learning<br>Ond ej Drbohlav, Ji í Matas, Jan Šochman Jan Šochman Ji í Matas (Gar.)   | Z,ZK       | 6       | 2P+2C    | Z        | Ρ    |
| BE4B35PSR       | Real-time Systems Programming<br>Michal Sojka Michal Sojka Michal Sojka (Gar.)   | Z,ZK       | 6       | 2P+2C    | Z        | Р    |
| BE4B39VGO       | Creating graphic content<br>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

| 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 and the key functions of routing protocols in IP networks and the key functions of routing protocols in the switched local networks and the key functions of routing protocols in IP networks and the key functions of routing protocols in the switched local networks and the key functions of routing protocols in the switched local networks and the key functions of routing protocols in IP networks and the key functions of routing protocols in the switched local networks and the key functions of routing protocols in the switched local networks and the key functions of routing protocols in the switched local networks and the key functions of routing protocols in the switched local networks and the key functions of routing protocols in IP networks and the switched local networks and the key functions of the switched local networks and the key functions of routing protocols in the switched local networks and the key functions of routing protocols in the switched local networks and the key functions of routing protocols in the switched local networks and the key functions of routing protocols in the switched local networks and the key functions of the switched local networks and the key functions of the switched local networks and the key functions of the key functions of the switched local networks and the key functions of the key fu | works. The course  | is aimed rather  |  |  |  |  |
| primarily practically ther  | n theoretically.   |                    |                  |  |  |  |  |
| BE5B35APO   | Computer Architectures   | Z,ZK               | 6                |  |  |  |  |
| Subject provides overvi   | ew of basic building blocks of computer systems. Explanation starts from hardware side where it extends knowledge present  | ed in the previous | lectures of      |  |  |  |  |
| Structures of computer  | systems. Topics cover building blocks description, CPU structure, multiple processors interconnections, input/output subsyste  | em and basic over  | rview 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 cor  | software view to the contrary. Students are lead from basic programming on CPU level to the interaction with raw hardware.   |                    |                  |  |  |  |  |
|   |  |                    |                  |  |  |  |  |

| ·                               |   |                   |                   |
|---------------------------------|---|-------------------|-------------------|
| BE4B38PSIA 0                    | Computer Networks   | Z,ZK              | 5                 |
|                                 | ciples and technologies of Computer Networks. Physical layer media, analog and digital modulations, network topologies, N   |                   |                   |
|                                 | els, coding and cryptography basics are introduced. Widely used LAN technologies are then presented together with their fe  | eatures. Internet | protocols are     |
|                                 | rking approaches are presented.   |                   | _                 |
|                                 | Functional Programming  | Z,ZK              | 6                 |
|                                 | idents into the techniques of functional programming, the advantages and disadvantages of this programming paradigm, and  |                   |                   |
|                                 | that the programmer symbolically describes the problem to be solved, rather than specifying the exact sequence of operal  | •                 |                   |
| e e                             | of the solved problem and implementing even more complex algorithms compactly. Functional programming has notable ad  | e 1               |                   |
|                                 | algorithms, and the most useful functional programming concepts are increasingly often introduced to standard programming<br>I on symbols, rather than numbers, functional programming has been heavily used in in artificial intelligence fields, such as ac |                   |                   |
|                                 | so part of the inter-university programme prg.ai Minor. It pools the best of AI education in Prague to provide students with a  |                   |                   |
|                                 | ence. More information is available at https://prg.ai/minor.  |                   |                   |
|                                 | ntroduction to Artificial Intelligence  | Z.ZK              | 6                 |
|                                 | o cover the basics of symbolic artificial intelligence. We will focus on algorithms of informed and uninformed state space se   | ,                 | -                 |
|                                 | knowledge using formal logic, methods of automated reasoning, and an introduction to Markov decision making, and to two   |                   |                   |
|                                 | ersity programme prg.ai Minor. It pools the best of AI education in Prague to provide students with a deeper and broader ins  | . , .             |                   |
| · ·                             | tion is available at https://prg.ai/minor.  |                   |                   |
| BE5B35LSP                       | Logic Systems and Processors  | Z.ZK              | 6                 |
|                                 | basic hardware structures of computing resources, their design, and architecture. It provides an overview of the possibiliti  | ,                 | -                 |
|                                 | the design of embedded processor systems with peripherals on modern FPGA programmable logic circuits, which are increased   |                   | •                 |
|                                 | in VHDL, from logic to more complex sequential circuits to practical finite state machine (FSM) designs. They will also mas   |                   |                   |
| using circuit simulation. P     | ractical problems are solved using development boards used at hundreds of leading universities around the world. The cou  | rse ends with RIS | SC-V processor    |
| structure, cache, and pipe      | eline processing.   |                   |                   |
| BE5B33RPZ F                     | 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 obser  | vations and class | es of objects is  |
|                                 | he raining set. The course covers both well-established and advanced classifier learning methods, as Perceptron, AdaBoost   |                   |                   |
|                                 | s also part of the inter-university programme prg.ai Minor. It pools the best of AI education in Prague to provide students with  | ith a deeper and  | broader insight   |
| into the field of artificial in | telligence. More information is available at https://prg.ai/minor.  |                   |                   |
|                                 | Real-time Systems Programming   | Z,ZK              | 6                 |
| 5                               | to provide students with basic knowledge about software development for real-time systems, for example in control and em  |                   |                   |
| -                               | tems equipped with a real-time operating system (RTOS). Lectures will cover real-time systems theory, which can be used to  |                   | -                 |
|                                 | t of lectures will introduce methods and techniques used for development of safety-critical systems, whose failure may have   |                   | •                 |
| <b>e</b>                        | first solve a few simple tasks to familiarize them with basic components of VxWorks RTOS and to benchmark the used OS<br>In the typical criteria for assessing the suitability of a given platform for the given application. After the simple tasks, student | •                 |                   |
|                                 | I application which will require full utilization of RTOS features. All the tasks at the labs will be implemented in C (or C++) la  |                   | IEX LOSK OF       |
|                                 |   | Z,ZK              | 6                 |
|                                 | Creating graphic content for provide theory behind geometric modeling and modeling of materials, give students an overview of methods used in the   |                   |                   |
|                                 | those methods in praxis. At the seminars, students will learn how to design and create three-dimensional scene, create and  | -                 | -                 |
|                                 | sky) and geometrical details, and position and set-up lights in the scene.  |                   | inating materials |
| (13)                            |   |                   |                   |
|                                 |   |                   |                   |
| •                               | up: 2015_BOIBAP   |                   |                   |
| Name of the gro                 | oup: Bachelor Project   |                   |                   |
| Requirement cr                  | edits in the group: In this group you have to gain 20 credits   |                   |                   |
| Requirement co                  | ourses in the group: In this group you have to complete 1 course  |                   |                   |
| Credits in the gi               | roup: 20  |                   |                   |
| Note on the gro                 | up:   |                   |                   |
|                                 | Name of the course / Name of the group of courses   |                   |                   |

| Code   | Name of the course / Name of the group of courses<br>(in case of groups of courses the list of codes of their<br>members)<br>Tutors, authors and guarantors (gar.) | Completion | Credits | Scope | Semester | Role |
|--------|--|------------|---------|-------|----------|------|
| BBAP20 | Bachelor thesis<br>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<br>(in case of groups of courses the list of codes of their<br>members)<br>Tutors, authors and guarantors (gar.) | Completion | Credits | Scope   | Semester | Role |
|------|--|------------|---------|---------|----------|------|
| BEZB | Safety in Electrical Engineering for a Bachelor's Degree<br>Ivana Nová, Radek Havlí ek, Vladimír K la <b>Radek Havlí ek</b> Vladimír K la<br>(Gar.)                | Z          | 0       | 2BP+2BC | Z,L      | Р    |
| BEZZ | Basic Health and Occupational Safety Regulations<br>Ivana Nová, Radek Havlí ek, Vladimír K la Radek Havlí ek Vladimír K la<br>(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:

| Code     | Name of the course / Name of the group of courses<br>(in case of groups of courses the list of codes of their<br>members)<br>Tutors, authors and guarantors (gar.) | Completion | Credits | Scope | Semester | Role |
|----------|--|------------|---------|-------|----------|------|
| B0B16ET1 | Ethic 1<br>Vladimír Sláme ka Vladimír Sláme ka Vladimír Sláme ka (Gar.)  | KZ         | 4       | 2P+2C | Z        | Р    |
| B0B16FIL | Philosophy<br>Peter Zamarovský Peter Zamarovský Peter Zamarovský (Gar.)  | ZK         | 2       | 2P+0S | Z,L      | Р    |
| B0B16FI1 | Philosophy 1<br>Peter Zamarovský Peter Zamarovský Peter Zamarovský (Gar.)  | KZ         | 4       | 2P+2S | Z        | Р    |
| B0B16HTE | History of technology and economic<br>Marcela Efmertová, Jan Mikeš Marcela Efmertová Marcela Efmertová (Gar.)  | ZK         | 2       | 2P+0S | Z,L      | Р    |
| B0B16HT1 | History of science and technology 1<br>Marcela Efmertová, Jan Mikeš Marcela Efmertová Marcela Efmertová (Gar.)   | KZ         | 4       | 2P+2S | Z        | Р    |
| B0B16HI1 | History 1<br>Milena Josefovi ová Milena Josefovi ová Milena Josefovi ová (Gar.)  | KZ         | 4       | 2P+2S | Z        | Р    |
| B0B16MPS | <b>Psychology</b><br>Jan Fiala <b>Jan Fiala</b> Jan Fiala (Gar.)   | Z,ZK       | 4       | 2P+2S | Z,L      | Р    |
| B0B16MPL | Psychology for managers<br>Jan Fiala Jan Fiala Jan Fiala (Gar.)  | ZK         | 2       | 2P+0S | Z,L      | Р    |
| A003TV   | Physical Education<br>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   | Aim of this subject is to provide the students an orientation not only in general problems of ethics but above all to offer instructions for solving various situations of human life. Essen |                 |              |  |  |  |
| parts of the subject are discussions in which students can react to lectures but also to actual questions coming with news and look for the communal answers. |  |                 |              |  |  |  |
| B0B16FIL  | Philosophy   | ZK              | 2            |  |  |  |
| We deal with the most i   | mportant persons, schools and ideas of ancient philosophy. We are concerned especially on transdisciplinary nature of philo  | sophy and conne | ction of old |  |  |  |
| philosophical thoughts  | with recent problems of science, technology, economics and politics.   |                 |              |  |  |  |
| B0B16FI1  | Philosophy 1   | KZ              | 4            |  |  |  |
| We deal with the most i   | mportant persons, schools and ideas of ancient philosophy. We are concerned especially on transdisciplinary nature of philo  | sophy and conne | ction of old |  |  |  |
| philosophical thoughts  | with recent problems of science, technology, economics and politics.   |                 |              |  |  |  |
| B0B16HTE  | History of technology and economic   | ZK              | 2            |  |  |  |
| B0B16HT1  | History of science and technology 1  | KZ              | 4            |  |  |  |
| B0B16HI1  | History 1  | KZ              | 4            |  |  |  |
| B0B16MPS  | Psychology   | Z,ZK            | 4            |  |  |  |
| B0B16MPL  | Psychology for managers  | ZK              | 2            |  |  |  |
| A003TV  | Physical Education   | Z               | 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

|                            | Name of the course / Name of the group of courses   |                      |               |               |                |                |
|----------------------------|---|----------------------|---------------|---------------|----------------|----------------|
| Code                       | (in case of groups of courses the list of codes of their members)   | Completion           | Credits       | Scope         | Semester       | Role           |
|                            | Tutors, <b>authors</b> and guarantors (gar.)  |                      |               |               |                |                |
| 34B33ALG                   | Algorithms<br>Marko Genyk-Berezovskyj, Daniel Pr ša Daniel Pr ša Marko<br>Genyk-Berezovskyj (Gar.)  | Z,ZK                 | 6             | 2P+2C         | z              | Ρ              |
| B0B35APO                   | Computer Architectures<br>Pavel Píša, Richard Šusta, Petr Št pán Pavel Píša Pavel Píša (Gar.)   | Z,ZK                 | 5             | 2P+2L         | L              | Р              |
| B0B36DBS                   | Database Systems<br>Martin imná, Václav Kratochvíl Martin imná Martin imná (Gar.)   | Z,ZK                 | 6             | 2P+2C+4E      | L              | Р              |
| 34B01DMA                   | Discrete Mathematics<br>Petr Habala Petr Habala Petr Habala (Gar.)  | Z,ZK                 | 5             | 2P+2S         | Z              | Р              |
| 30B01LAG                   | Linear Algebra<br>Ji í Velebil, Jakub Rondoš, Natalie Žukovec, Daniel Gromada, Josef Dvo ák,<br>Mat j Dostál <b>Ji í Velebil</b> Ji í Velebil (Gar.)  | Z,ZK                 | 8             | 4P+2S         | z              | Ρ              |
| B0B01LGR                   | Logic and Graphs<br>Natalie Žukovec, Mat j Dostál, Alena Gollová Alena Gollová Marie Demlová<br>(Gar.)  | Z,ZK                 | 5             | 3P+2S         | Z,L            | Ρ              |
| B0B01MA1                   | Mathematical Analysis 1<br>Josef Dvo ák, Martin K epela, Josef Tkadlec, Veronika Sobotíková Josef<br>Tkadlec Josef Tkadlec (Gar.)   | Z,ZK                 | 7             | 4P+2S         | Z,L            | Ρ              |
| B0B01MA2                   | <b>Mathematical Analysis 2</b><br>Miroslav Korbelá, Petr Hájek, Martin Bohata, Jaroslav Tišer, Karel Pospíšil,<br>Paola Vivi, Hana Tur inová <b>Petr Hájek</b> Jaroslav Tišer (Gar.)  | Z,ZK                 | 7             | 4P+2S         | L,Z            | Ρ              |
| B4B35OSY                   | <b>Operating Systems</b><br>Michal Sojka, Petr Št pán <b>Michal Sojka</b> Michal Sojka (Gar.)   | Z,ZK                 | 4             | 2P+2C         | Z              | Р              |
| B0B33OPT                   | <b>Optimization</b><br>Tomáš Werner, Petr Olšák, Mirko Navara, Tomáš Kroupa <b>Tomáš Werner</b><br>Tomáš Werner (Gar.)  | Z,ZK                 | 7             | 4P+2C         | Z,L            | Ρ              |
| 34B36PDV                   | Parallel and Distributed Computing<br>Mat j Kafka, Michal Jakob Michal Jakob Michal Jakob (Gar.)  | Z,ZK                 | 6             | 2P+2C         | L              | Ρ              |
| 34B38PSIA                  | Computer Networks<br>Ji í Novák, Jan Holub <b>Ji í Novák</b> Ji í Novák (Gar.)  | Z,ZK                 | 5             | 2P+2L         | L              | Ρ              |
| B0B01PST                   | Probability and Statistics<br>Kate ina Helisová Kate ina Helisová Petr Hájek (Gar.)   | Z,ZK                 | 7             | 4P+2S         | Z              | Ρ              |
| B0B36PRP                   | Procedural Programming<br>Jan Faigl Jan Faigl (Gar.)  | Z,ZK                 | 6             | 2P+2C         | Z              | Р              |
| B0B36PJV                   | Programming in Java<br>Ji í Vok ínek, Martin Mudroch, Ladislav Serédi <b>Ji í Vok ínek</b> Ji í Vok ínek<br>(Gar.)  | Z,ZK                 | 6             | 2P+3C+7E      | L              | Р              |
| B4B33RPH                   | Solving Problems and other Games<br>Petr Pošík, Tomáš Svoboda Petr Pošík Tomáš Svoboda (Gar.)   | КZ                   | 6             | 2P+3C         | Z              | Ρ              |
| B4BPROJ6                   | Unassisted project<br>Petr Pošík, Tomáš Svoboda, Ji í Šebek, Jaroslav Sloup, Ivan Jelínek, Katarína<br>Žmolíková Petr Pošík   | Z                    | 6             | 0+2           | Z,L            | Ρ              |
|                            | the courses of this group of Study Plan: Code=2015_BOIP Name  | =Compulsory          | v subject     | s of the      | programme      | •              |
| 34B33ALG                   | Algorithms  |                      |               | 2             | Z,ZK           | 6              |
| , 0                        | nms development is constructed with minimum dependency to programming language; ne  |                      |               |               |                |                |
|                            | basic algorithms, recursive functions, abstract data types, stack, queues, trees, searching   | , sorting, special a | application a | Igorithms, [  | Dynamic progra | amming.        |
|                            | gn and construct non-trivial algorithms and to evaluate their effectivity.  |                      |               |               | 7 71/          | -              |
|                            | Computer Architectures  |                      |               |               | Z,ZK           | 5              |
|                            | Database Systems  | model and to use     | the SOL In-   |               | Z,ZK           | 6              |
| -                          | is a basic database course mainly aimed at the student ability to design a relational data<br>ose the appropriate degree of transaction isolation. Students will also get acquainted with   |                      |               |               |                |                |
|                            | nagement. They will verify their knowledge during the elaboration of a continuously subm  |                      | -             | Loning LECIII | inques, ualava | So Systell     |
| I                          | Discrete Mathematics  |                      |               |               | Z,ZK           | 5              |
| 1                          | eet some important topics from the field of discrete mathematics. Namely, they will explore   | divisibility and ca  | culations m   |               |                |                |
| elations, mappings, card   | linality of sets, induction, and recurrence equations. The second aim of this course is to te<br>em to mathematics as science.  | -                    |               |               | -              |                |
| B0B01LAG                   | Linear Algebra  | o covorod (lipport   | lonondonce    |               | Z,ZK           | 8<br>coordinat |
| etc). The calculus of matr | tial parts of linear algebra. Firstly, the basic notions of a linear space and linear mappings ar<br>rices (determinants, inverse matrices, matrices of a linear map, eigenvalues and eigenvect<br>equations, the geometry of a 3D space (including the scalar product and the vector product<br>and the vector product and the vector | tors, diagonalisat   |               |               |                |                |
|                            | equations, the geometry of a 3D space (including the scalar product and the vector product<br>logic and Graphs  | ucij anu SVD.        |               |               | Z,ZK           | 5              |
|                            | Logic and Graphs<br>s of mathematical logic and graph theory. Syntax and semantics of propositional and predica   | te logic are introd  | uced The in   |               |                |                |
|                            | etween a formula and its model is stressed. Further, basic notions from graph theory are i  | -                    |               | יטיייטיייטיי  |                | onsequel       |
|                            | Mothematical Analysis 1   |                      |               |               | 7 71/          | 7              |

Z,ZK

7

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.

| 30B01MA2   | Mathematical Analysis 2   | Z,ZK  | 7   |
|--|---|---|---|
| The subject covers a   | n introduction to the differential and integral calculus in several variables and basic relations between curve and surface integra   | als. Other part cont  | ains function   |
| series and power ser   | ies with application to Taylor and Fourier series.  |   |   |
| B4B35OSY   | Operating Systems   | Z,ZK  | 4   |
| ecture introduces o  | peration system's basic concepts and principles as processes, threads, communication and synchronization, virtual memory, d   | rivers, file systems  | , basic securit   |
| spects. These topics   | s are theoretically described and demonstrated on Linux and Windows OS with multi-core systems. Practical exercises from OS   | S in C programmin   | g language wi   |
| e solved on labs. St   | udents will work with Linux OS and micro-kernel NOVA.   |   |   |
| 30B33OPT   | Optimization  | Z,ZK  | 7   |
| he course provides   | an introduction to mathematical optimization, specifically to optimization in real vector spaces of finite dimension. The theory is illu  | strated with a num  | ber of example  |
| ou will refresh and e  | xtend many topics that you know from linear algebra and calculus courses.   |   |   |
| 34B36PDV   | Parallel and Distributed Computing  | Z,ZK  | 6   |
| 34B38PSIA  | Computer Networks   | Z,ZK  | 5   |
| B0B01PST   | Probability and Statistics  | Z,ZK  | 7   |
|  |   | Z,ZK  | 6   |
| 0B36PRP  | Procedural Programming  |   |   |
| he course accompa<br>re developed. Stude<br>rograms. At the sam<br>s used that provides<br>nd linking but also w   | Procedural Programming<br>nies basic programming emphasizing the data representation in computer memory. Furthermore, the concepts of linked data stru-<br>nts master the practical implementation of simple individual tasks. The course emphasizes acquiring programming habits for cr<br>e time, the effort is to build students an overview of the program operation, data model, memory access, and management. There<br>a direct link between the program data structures and their representation in the computer memory. Students will get acquainted<br>ith debugging and profiling. Labs aim to acquire practical skills of implementing simple individual tasks, emphasizing functional<br>is is developed by a set of homework with the possibility of optional and bonus assignments. The final task is an integration of a  | uctures and proces<br>reating readable a<br>efore, the C program<br>d not only with prog<br>ty and accuracy of  | nd reusable<br>mming langua<br>ram compilati<br>implementatio   |
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| The course accomparate developed. Stude<br>orograms. At the sams<br>is used that provides<br>and linking but also will<br>Student independence<br>mplementations. Eva<br>30B36PJV<br>The course builds on<br>of the Java language<br>will be introduced. An<br>of solving partial task<br>correctness and effic<br>34B33RPH<br>The main motivation<br>define interfaces, how<br>optimal way. The uns<br>he student should be | nies basic programming emphasizing the data representation in computer memory. Furthermore, the concepts of linked data structures master the practical implementation of simple individual tasks. The course emphasizes acquiring programming habits for creating the effort is to build students an overview of the program operation, data model, memory access, and management. There a direct link between the program data structures and their representation in the computer memory. Students will get acquainted ith debugging and profiling. Labs aim to acquire practical skills of implementing simple individual tasks, emphasizing functionalities is developed by a set of homework with the possibility of optional and bonus assignments. The final task is an integration of coding style motivated by writing legible, understandable, and maintainable codes is also a part of the selected tasks is a for coding style motivated by writing legible, understandable, and maintainable codes is also a part of the selected tasks is an integration of coding style motivated by writing legible, understandable, and maintainable codes is also a part of the selected tasks is an integration, so for the course includes exceptions, event handling, and building a graphical interface. Basic library methods, working important topic is models of multithreaded applications and their implementation. Practical exercises of practical skills and know is and semester work, which will be submitted continuously through the source code version control system. The semester wor ency of the code, as well as points that take into account the quality of the source codes, their readability and reusability. <b>Solving Problems and other Games</b> is to let students to deal with real-world problems properly. When working on real problems the student shall learn how to decord to test and validate individual steps and so on. Many problems will actually be beyond the first-year-student skills. And many poleved parts should motivate the students to study difficult theoretical sub | uctures and proces<br>reating readable and<br>efore, the C program<br>d not only with prog<br>ty and accuracy of<br>a larger program us<br><b>Z,ZK</b><br>are also focus on the<br>g with files and using<br>wiedge of Java is to<br>k scoring consists<br><b>KZ</b><br>mpose the big pro<br>problem will not be<br>deally, at the end of | nd reusable<br>mming langua<br>ram compilati<br>implementation<br>sing existing<br>6<br>e object concerning<br>generic typ<br>ested in the for<br>of points for t<br>6<br>blem, how to<br>solved in the<br>f the subject,       |
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# 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<br>(in case of groups of courses the list of codes of their<br>members)<br>Tutors, authors and guarantors (gar.)                        | Completion | Credits | Scope | Semester | Role |
|----------|---|------------|---------|-------|----------|------|
| B0B04B1K | English language B1 - classified assessment<br>Markéta Havli ková, Pavla Péterová, Erik Peter Stadnik, Michael Ynsua, Dana<br>Saláková, Petra Juna Jennings Petra Juna Jennings<br>(Gar.) | κz         | 0       | 0C    | Z,L      | Ρ    |
| B0B04B2Z | English language B2 - exam<br>Markéta Havlí ková, Michael Ynsua, Dana Saláková, Petra Juna Jennings<br>Petra Juna Jennings Petra Juna Jennings (Gar.)                                     | Z,ZK       | 0       | 0C    | Z,L      | Ρ    |

## 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 Examir     | nation Rules and  |  |  |  |  |
| Regulations for Student                       | s at CTU (Part III, Article 4), a compulsory subject is one whose completion is a necessary condition in order to successfully  | complete the stud    | ly programme. In  |  |  |  |  |
| addition, this requires th                    | e passing of an examination evaluated on the scale A, B, C, D, or E (SERR Part III, Article 6). II) According to the Common E   | uropean Framew       | ork 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-Interm     | nediate) level is |  |  |  |  |
| one who can understand                        | d the main ideas of complex text on both concrete and abstract topics, including technical discussions in his/her field of specia   | lisation. Can intera | act with a degree |  |  |  |  |
| of fluency and spontane                       | 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            |                      |                   |  |  |  |  |
|   | s 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     | Name of the course / Name of the group of courses<br>(in case of groups of courses the list of codes of their<br>members)<br>Tutors, authors and guarantors (gar.) | Completion | Credits | Scope   | Semester | Role |
|----------|--|------------|---------|---------|----------|------|
| B4B17EAM | Electromagnetism<br>Zbyn k Škvor, Pavel Hazdra Jan Kra ek Zbyn k Škvor (Gar.)  | Z,ZK       | 6       | 2P+2C   | z        | PO   |
| B0B35LSP | Logic systems and processors<br>Richard Šusta, Martin Hlinovský Martin Hlinovský Zden k Hurák (Gar.)   | Z,ZK       | 6       | 2P+2L   | L        | PO   |
| B4B38NVS | Embedded Systems Design<br>Jan Fischer, Vojt ch Petrucha Jan Fischer Jan Fischer (Gar.)  | Z,ZK       | 6       | 2P+2L   | Z        | PO   |
| B4B32PKS | Computer and Communication Networks<br>Leoš Bohá , Tomáš Van k Ivan Pravda Leoš Bohá (Gar.)  | Z,ZK       | 6       | 2P + 2C | L        | PO   |
| B4B35PSR | Real-time Systems Programming<br>Michal Sojka Michal Sojka Michal Sojka (Gar.)   | Z,ZK       | 6       | 2P+2C   | Z        | PO   |

### Characteristics of the courses of this group of Study Plan: Code=2015\_BOIPO2 Name=Compulsory subjects of the branch

B4B17EAM Electromagnetism 7.7K 6 The subject introduces the basics of electrical engineering, electromagnetic fields, and simple active/passive electronic circuits. We will also explore optics, acoustics, and antennas. Emphasis is placed on understanding the physical principles behind these phenomena. During the lessons, we not only write on the board but also demonstrate computer simulations and conduct small experiments. Z,ZK 6

#### B0B35LSP Logic systems and processors

The course introduces computing resources' basic hardware structures, design, and architecture. It provides an overview of the possibilities of performing data operations at the hardware level and designing 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 that hundreds of leading universities worldwide also use. The course ends with RISC-V processor structure, cache, and pipeline processing. [last updated January 2024] B4B38NVS Embedded Systems Design Z,ZK 6 The course deals with design of embedded systems using ARM based microcontrollers. B4B32PKS 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 second part of the course introduces students to concepts of ensuring the information security in the communication networks. An integral part of the course is also an explanation of the principles for ensuring the adequate quality of services in data networks and features of some file sharing application protocols. The course is aimed rather primarily practically then theoretically

#### B4B35PSR Real-time Systems Programming 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 Zyna). 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.

Z,ZK

6

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

| B0B04B12 | English Language B1-2<br>Petra Juna Jennings Petra Juna Jennings (Gar.) | Z | 0 | 2C | L   | V |
|----------|---|---|---|----|-----|---|
| B0B04B21 | English Language B2-1<br>Petra Juna Jennings Petra Juna Jennings (Gar.) | Z | 3 | 2C | Z   | V |
| B0B04B22 | English Language B2-2<br>Petra Juna Jennings Petra Juna Jennings (Gar.) | Z | 3 | 2C | Z,L | V |
|          |   |   |   |    |     |   |

### Characteristics of the courses of this group of Study Plan: Code=2015\_BJKA Name=English language courses

| B0B04A21  | English Language A2-1   | Z  |  |
|---|---|--|--|
| The course is open to s   | tudents 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 s   | tudents who are beginners in their second foreign language. The course objective is to develop and sustain their basic knowledge  | edge of the Englis   | sh language.   |
| B0B04B11  | English Language B1-1   | Z  | 0  |
| Course objective: Broad   | ening the basic knowledge of general English; mastering basic specialised language; focusing on text analysis and vocabulary  | expansion; under   | standing spoken  |
| English.  |   |  |  |
| B0B04B12  | English Language B1-2   | Z  | 0  |
| Course objective: Broad   | ening the basic knowledge of general English; mastering basic specialised language; focusing on text analysis and vocabulary  | expansion; under   | standing spoken  |
| English.  |   |  |  |
| B0B04B21  | English Language B2-1   | Z  | 3  |
|   |   |  |  |
| This course is designed   | as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk E   | 32 - zkouška - B0  | B04B2Z*). While  |
| °,  | as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglicky jazyk E<br>n helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark   |  | ,  |
| the course is focused of  |   | x), it also focuses  | more on the  |
| the course is focused of  | helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark  | x), it also focuses  | more on the  |
| the course is focused of academic and technical   | helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark  | x), it also focuses  | more on the  |
| the course is focused o<br>academic and technical<br>/ International Study.<br>B0B04B22   | n helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark<br>vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an approp  | x), it also focuses<br>priate level of Eng<br>Z  | more on the<br>lish for Erasmus                                    |
| the course is focused o<br>academic and technical<br>/ International Study.<br>B0B04B22<br>This course is designed                            | helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark<br>vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an approp<br>English Language B2-2   | k), it also focuses<br>priate level of Eng<br>Z<br>32 - zkouška - B0B                        | more on the<br>lish for Erasmus<br>304B2Z *). While                |
| the course is focused o<br>academic and technical<br>/ International Study.<br>B0B04B22<br>This course is designed<br>the course is focused o | helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark<br>vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriate<br>English Language B2-2<br>as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B | (), it also focuses<br>priate level of Eng<br>Z<br>32 - zkouška - BOB<br>(), it also focuses | more on the<br>lish for Erasmus<br>304B2Z *). While<br>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<br>(in case of groups of courses the list of codes of their<br>members)<br>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<br>(in case of groups of courses the list of codes of their<br>members)<br>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 | Ζ. | 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: ~Nabío

~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:

| A003TV  | Name of the course   | Completion  | Credits   |
|---|--|---|---|
|   | Physical Education   | Z   | 2   |
| B0B01LAG  | Linear Algebra   | Z,ZK  | 8   |
| The course covers f   | the initial parts of linear algebra. Firstly, the basic notions of a linear space and linear mappings are covered (linear dependence and inde  | ependence, basis, o   | coordinates   |
| etc). The calculus  | of matrices (determinants, inverse matrices, matrices of a linear map, eigenvalues and eigenvectors, diagonalisation, etc) is covered  | next. The application   | 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  | basics of mathematical logic and graph theory. Syntax and semantics of propositional and predicate logic are introduced. The importanc<br>and of the relationship between a formula and its model is stressed. Further, basic notions from graph theory are introduced   |   | onsequence  |
| B0B01MA1  | Mathematical Analysis 1  | Z,ZK  | 7   |
|   | The aim of the course is to introduce students to basics of differential and integral calculus of functions of one variable.   |   |   |
| B0B01MA2  | Mathematical Analysis 2  | Z,ZK  | 7   |
| The subject cover   | rs an introduction to the differential and integral calculus in several variables and basic relations between curve and surface integrals.   | Other part contair  | ns function   |
|   | series and power series with application to Taylor and Fourier series.   |   |   |
| B0B01PST  | Probability and Statistics   | Z,ZK  | 7   |
| B0B04A21  | English Language A2-1  | Z   |   |
|   | The course is open to students who are beginners in their second language. Course objective: Achieving competence in basic E   | nglish.   |   |
| B0B04A22  | English Language A2-2  | Z   | 0   |
| The course is ope   | en to students who are beginners in their second foreign language. The course objective is to develop and sustain their basic knowled  | 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 exp<br>English.   | bansion; understan  | ding spoker   |
| 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 exp<br>English.   | bansion; understan  | ding spoker   |
| B0B04B1K  | English language B1 - classified assessment<br>verifying of the student's skills of B1 level   | KZ  | 0   |
| B0B04B21  | English Language B2-1  | 7   | 3   |
|   | gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 -  |   |   |
|   | used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark)<br>nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropria<br>/ International Study.   | , it also focuses mo  | ore on the  |
|   | used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark)<br>nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropria   | , it also focuses mo  | ore on the  |
| academic and tech<br>B0B04B22   | used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark)<br>nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropria<br>/ International Study.   | , it also focuses mo<br>te level of English<br>Z  | for Erasmus   |
| academic and tech<br>B0B04B22<br>This course is desig<br>the course is focu   | used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark)<br>nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropria<br>/ International Study.<br>English Language B2-2<br>gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 -<br>used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark)<br>nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropria   | , it also focuses mo<br>tte level of English<br>Z<br>zkouška - B0B04B<br>, it also focuses mo   | for Erasmus<br>3<br>22Z *). While<br>ore on the   |
| academic and tech<br>B0B04B22<br>This course is desig<br>the course is focu<br>academic and tech  | used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark)<br>nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropria<br>/ International Study.<br>English Language B2-2<br>gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 -<br>used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark)<br>nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropria<br>/ International Study.   | , it also focuses mo<br>tte level of English<br>Z<br>zkouška - B0B04B<br>, it also focuses mo<br>tte level of English   | for Erasmus<br>3<br>22 *). While<br>ore on the<br>for Erasmus   |
| academic and tech<br>B0B04B22<br>This course is desig<br>the course is focu<br>academic and tech<br>B0B04B2Z  | used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark)<br>nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropria<br>/ International Study.<br>English Language B2-2<br>gned as a full-year, two semester preparation course for the university compulsory B2-level English Examination (Anglický jazyk B2 -<br>used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark)<br>nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropria<br>/ International Study.<br>English language B2 - exam  | , it also focuses mo<br>tte level of English<br>Z<br>zkouška - B0B04B<br>, it also focuses mo<br>tte level of English<br>Z,ZK   | ore on the<br>for Erasmus<br>2Z *). While<br>pre on the<br>for Erasmus<br>0   |
| academic and tech<br>B0B04B22<br>This course is desig<br>the course is focu<br>academic and tech<br>B0B04B2Z<br>I) The B2 English E<br>Regulations for Stu<br>addition, this requir   | used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark)<br>nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropria<br>/ International Study.<br>English Language B2-2<br>gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 -<br>used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark)<br>nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropria<br>/ International Study.<br>International Study.<br>English language B2 - exam<br>Exam is a compulsory subject for all Faculty of Electrical Engineering students at the Czech Technical University. According to the Stud<br>dents at CTU (Part III, Article 4), a compulsory subject is one whose completion is a necessary condition in order to successfully com<br>es 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 Euro  | , it also focuses mo<br>tte level of English<br>Zkouška - B0B04B<br>, it also focuses mo<br>tte level of English<br>Z,ZK<br>dy and Examination<br>pplete the study pro<br>pean Framework o  | ore on the<br>for Erasmus<br>3<br>227*). While<br>ore on the<br>for Erasmus<br>0<br>n Rules and<br>ogramme. In<br>f Reference   |
| BOB04B22<br>This course is design<br>the course is focu<br>academic and tech<br>BOB04B2Z<br>I) The B2 English E<br>Regulations for Stu<br>addition, this requir<br>for Languages (CE  | used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark)<br>nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropria<br>/ International Study.<br>English Language B2-2<br>gned as a full-year, two semester preparation course for the university scompulsory B2-level English Examination (Anglický jazyk B2 -<br>used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark)<br>nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropria<br>/ International Study.<br>English language B2 - exam<br>Exam is a compulsory subject for all Faculty of Electrical Engineering students at the Czech Technical University. According to the Stud<br>dents at CTU (Part III, Article 4), a compulsory subject is one whose completion is a necessary condition in order to successfully com<br>es 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 Euro<br>EFR), an international standard for describing language ability, the definition of an English language learner who has achieved the B2  | , it also focuses mo<br>ate level of English<br>Z<br>zkouška - B0B04B<br>, it also focuses mo<br>the level of English<br>Z,ZK<br>dy and Examination<br>aplete the study pro<br>pean Framework o<br>2 (Upper-Intermedia  | ore on the<br>for Erasmus<br>2Z *). While<br>for Erasmus<br>0<br>n Rules and<br>ogramme. Ir<br>f Reference<br>ate) level is   |
| academic and tech<br>B0B04B22<br>This course is desig<br>the course is focu<br>academic and tech<br>B0B04B2Z<br>I) The B2 English E<br>Regulations for Stu<br>addition, this requir<br>for Languages (CE<br>one who can under   | used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark)<br>nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropria<br>/ International Study.<br>English Language B2-2<br>gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 -<br>used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark)<br>nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropria<br>/ International Study.<br>English language B2 - exam<br>is a compulsory subject for all Faculty of Electrical Engineering students at the Czech Technical University. According to the Stud<br>dents at CTU (Part III, Article 4), a compulsory subject is one whose completion is a necessary condition in order to successfully com<br>es 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 Euro<br>EFR), an international standard for describing language ability, the definition of an English language learner who has achieved the B2<br>stand the main ideas of complex text on both concrete and abstract topics, including technical discussions in his/her field of specialisat   | , it also focuses mo<br>the level of English<br>Zkouška - B0B04B<br>, it also focuses mo<br>the level of English<br>Z,ZK<br>dy and Examination<br>plete the study pro<br>pean Framework o<br>t (Upper-Intermedia<br>ion. Can interact w   | ore on the<br>for Erasmus<br>3<br>22Z *). While<br>ore on the<br>for Erasmus<br>0<br>n Rules and<br>ogramme. In<br>f Reference<br>ate) level is<br>ith a degree   |
| B0B04B22<br>This course is design<br>the course is focu<br>academic and tech<br>B0B04B2Z<br>I) The B2 English E<br>Regulations for Stu<br>addition, this requir<br>for Languages (CE<br>one who can under<br>of fluency and spor  | used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark)<br>nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropria<br>/ International Study.<br>English Language B2-2<br>gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 -<br>used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark)<br>nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropria<br>/ International Study.<br>English language B2 - exam<br>is a compulsory subject for all Faculty of Electrical Engineering students at the Czech Technical University. According to the Stud<br>dents at CTU (Part III, Article 4), a compulsory subject is one whose completion is a necessary condition in order to successfully com<br>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 Euro<br>EFR), an international standard for describing language ability, the definition of an English language learner who has achieved the B2<br>stand the main ideas of complex text on both concrete and abstract topics, including technical discussions in his/her field of specialisat<br>traneity that makes regular interaction with native speakers quite possible without strain for either party. Can produce clear, detailed to   | , it also focuses mo<br>the level of English<br>Zkouška - B0B04B<br>, it also focuses mo<br>the level of English<br>Z,ZK<br>dy and Examination<br>plete the study pro<br>pean Framework o<br>t (Upper-Intermedia<br>ion. Can interact w<br>ext on a wide range  | ore on the<br>for Erasmus<br>3<br>227*). While<br>ore on the<br>for Erasmus<br>0<br>n Rules and<br>ogramme. Ir<br>f Reference<br>ate) level is<br>ith a degree<br>e of subjects                                   |
| academic and tech<br>B0B04B22<br>This course is desig<br>the course is foct<br>academic and tech<br>B0B04B2Z<br>I) The B2 English E<br>Regulations for Stu<br>addition, this requir<br>for Languages (CE<br>one who can under<br>of fluency and spor<br>and explain a view  | used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark)<br>nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropria<br>/ International Study.<br>English Language B2-2<br>gned as a full-year, two semester preparation course for the university compulsory B2-level English Examination (Anglický jazyk B2 -<br>used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark)<br>nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropria<br>/ International Study.<br>English language B2 - exam<br>Exam is a compulsory subject for all Faculty of Electrical Engineering students at the Czech Technical University. According to the Stud<br>dents at CTU (Part III, Article 4), a compulsory subject is one whose completion is a necessary condition in order to successfully com<br>es 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 Euro<br>EFR), an international standard for describing language ability, the definition of an English language learner who has achieved the B2<br>stand the main ideas of complex text on both concrete and abstract topics, including technical discussions in his/her field of specialisat<br>ntaneity that makes regular interaction with native speakers quite possible without strain for either party. Can produce clear, detailed te<br>wpoint on a topical issue giving the advantages and disadvantages of various options. III) Students who have successfully passed an   | , it also focuses mo<br>te level of English<br>Z<br>zkouška - B0B04B<br>, it also focuses mo<br>te level of English<br>Z,ZK<br>dy and Examination<br>plete the study pro<br>pean Framework o<br>(Upper-Intermedia<br>ion. Can interact we<br>ext on a wide range<br>approved internation  | ore on the<br>for Erasmus<br>3<br>227*). While<br>ore on the<br>for Erasmus<br>0<br>n Rules and<br>ogramme. In<br>f Reference<br>ate) level is<br>ith a degree<br>e of subjects<br>onal exam                      |
| academic and tech<br>B0B04B22<br>This course is desig<br>the course is foct<br>academic and tech<br>B0B04B2Z<br>I) The B2 English E<br>Regulations for Stu<br>addition, this requir<br>for Languages (CE<br>one who can under<br>of fluency and spor<br>and explain a view<br>within the past five                                    | used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark)<br>nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropria<br>/ International Study.<br>English Language B2-2<br>gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 -<br>used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark)<br>nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropria<br>/ International Study.<br>English language B2 - exam<br>exam is a compulsory subject for all Faculty of Electrical Engineering students at the Czech Technical University. According to the Stud<br>dents at CTU (Part III, Article 4), a compulsory subject is one whose completion is a necessary condition in order to successfully com<br>es 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 Euro<br>EFR), an international standard for describing language ability, the definition of an English language learner who has achieved the B2<br>stand the main ideas of complex text on both concrete and abstract topics, including technical discussions in his/her field of specialisat<br>traneity that makes regular interaction with native speakers quite possible without strain for either party. Can produce clear, detailed te<br>vpoint on a topical issue giving the advantages and disadvantages of various options. III) Students who have successfully passed an<br>years may present their certificate to the Department of Languages, Faculty of Electrical Engineering. Upon approval, students are the<br>Test and the Oral Part. For a list of approved international exams go the department website: http://jazyky.fel.cvut.cz/            | , it also focuses mo<br>te level of English<br>Z<br>zkouška - B0B04B<br>, it also focuses mo<br>te level of English<br>Z,ZK<br>dy and Examination<br>plete the study pro<br>pean Framework o<br>(Upper-Intermedia<br>ion. Can interact we<br>ext on a wide range<br>approved internation<br>n exempt from both                                  | ore on the<br>for Erasmus<br>2Z *). While<br>ore on the<br>for Erasmus<br>0<br>n Rules and<br>ogramme. In<br>f Reference<br>ate) level is<br>ith a degree<br>e of subjects<br>onal exam<br>he Writter             |
| academic and tech<br>B0B04B22<br>This course is desig<br>the course is foct<br>academic and tech<br>B0B04B2Z<br>I) The B2 English E<br>Regulations for Stu<br>addition, this requir<br>for Languages (CE<br>one who can under<br>of fluency and spor<br>and explain a view<br>within the past five<br>B0B16ET1                        | International Students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark)<br>inical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropria<br>/ International Study.<br>English Language B2-2<br>gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 -<br>used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark)<br>inical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropria<br>/ International Study.<br>English language B2 - exam<br>ixam is a compulsory subject for all Faculty of Electrical Engineering students at the Czech Technical University. According to the Stud<br>dents at CTU (Part III, Article 4), a compulsory subject is one whose completion is a necessary condition in order to successfully com-<br>es 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 Euro<br>EFR), an international standard for describing language ability, the definition of an English language learner who has achieved the B2<br>stand the main ideas of complex text on both concrete and abstract topics, including technical discussions in his/her field of specialisat<br>traneity that makes regular interaction with native speakers quite possible without strain for either party. Can produce clear, detailed te<br>vpoint on a topical issue giving the advantages and disadvantages of various options. III) Students who have successfully passed an<br>years may present their certificate to the Department of Languages, Faculty of Electrical Engineering.Upon approval, students are the<br>Test and the Oral Part. For a list of approved international exams go the department website: http://jazyky.fel.cvut.cz/<br>Ethic 1 | , it also focuses mo<br>the level of English<br>zkouška - B0B04B<br>, it also focuses mo<br>the level of English<br>Z,ZK<br>dy and Examination<br>plete the study pro<br>pean Framework o<br>t (Upper-Intermedia<br>ion. Can interact w<br>ext on a wide range<br>approved internation<br>n exempt from both<br>KZ                              | ore on the<br>for Erasmus<br>3<br>227 *). While<br>ore on the<br>for Erasmus<br>on Rules and<br>ogramme. In<br>f Reference<br>ate) level is<br>ith a degree<br>of subjects<br>onal exam<br>on the Writter<br>4    |
| academic and tech<br>B0B04B22<br>This course is desig<br>the course is foct<br>academic and tech<br>B0B04B2Z<br>I) The B2 English E<br>Regulations for Stu<br>addition, this requir<br>for Languages (CE<br>one who can under<br>of fluency and spor<br>and explain a view<br>within the past five<br>B0B16ET1<br>Aim of this subject | used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark)<br>nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropria<br>/ International Study.<br>English Language B2-2<br>gned as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 -<br>used on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark)<br>nical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropria<br>/ International Study.<br>English language B2 - exam<br>exam is a compulsory subject for all Faculty of Electrical Engineering students at the Czech Technical University. According to the Stud<br>dents at CTU (Part III, Article 4), a compulsory subject is one whose completion is a necessary condition in order to successfully com<br>es 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 Euro<br>EFR), an international standard for describing language ability, the definition of an English language learner who has achieved the B2<br>stand the main ideas of complex text on both concrete and abstract topics, including technical discussions in his/her field of specialisat<br>traneity that makes regular interaction with native speakers quite possible without strain for either party. Can produce clear, detailed te<br>vpoint on a topical issue giving the advantages and disadvantages of various options. III) Students who have successfully passed an<br>years may present their certificate to the Department of Languages, Faculty of Electrical Engineering. Upon approval, students are the<br>Test and the Oral Part. For a list of approved international exams go the department website: http://jazyky.fel.cvut.cz/            | , it also focuses mo<br>ite level of English<br>Z<br>zkouška - B0B04B<br>, it also focuses mo<br>ite level of English<br>Z,ZK<br>dy and Examination<br>plete the study pro<br>pean Framework o<br>(Upper-Intermedia<br>ion. Can interact we<br>ext on a wide range<br>approved internation<br>n exempt from both<br>KZ<br>lations of human lite | ore on the<br>for Erasmus<br>2Z *). While<br>ore on the<br>for Erasmus<br>0<br>n Rules and<br>ogramme. Ir<br>f Reference<br>ate) level is<br>ith a degree<br>e of subjects<br>onal exam<br>the Writter<br>4       |
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| B0B16FIL              | Philosophy  | ZK                   | 2             |
|-----------------------|---|----------------------|---------------|
| We deal with the      | most important persons, schools and ideas of ancient philosophy. We are concerned especially on transdisciplinary nature of philos  | ophy and connect     | ion of old    |
|                       | philosophical thoughts with recent problems of science, technology, economics and politics.   |                      |               |
| B0B16HI1              | History 1   | KZ                   | 4             |
| B0B16HT1              | History of science and technology 1   | KZ                   | 4             |
| B0B16HTE              | History of technology and economic  | ZK                   | 2             |
| B0B16MPL              | Psychology for managers   | ZK                   | 2             |
| B0B16MPS              | Psychology  | Z,ZK                 | 4             |
| B0B33OPT              | Optimization  | Z,ZK                 | 7             |
| The course provide:   | s an introduction to mathematical optimization, specifically to optimization in real vector spaces of finite dimension. The theory is illustrat   | ed with a number     | of examples.  |
|                       | You will refresh and extend many topics that you know from linear algebra and calculus courses.   | 7 71/                | <b>_</b>      |
| B0B35APO              | Computer Architectures  | Z,ZK                 | 5             |
| B0B35LSP              | Logic systems and processors  | Z,ZK                 | 6             |
|                       | es computing resources' basic hardware structures, design, and architecture. It provides an overview of the possibilities of performing d<br>g embedded processor systems with peripherals on modern FPGA programmable logic circuits, which are increasingly widely used t             | -                    |               |
| -                     | DL, from logic to more complex sequential circuits to practical finite state machine (FSM) designs. They will also master the correct di  | -                    |               |
|                       | I problems are solved using development boards that hundreds of leading universities worldwide also use. The course ends with RISC  |                      | -             |
|                       | and pipeline processing. [last updated January 2024]  |                      |               |
| B0B36DBS              | Database Systems  | Z,ZK                 | 6             |
| The course is desig   | 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  | or data definition a | s 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 to  |                      | ase system    |
|                       | architecture and their management. They will verify their knowledge during the elaboration of a continuously submitted seminar  |                      |               |
| B0B36PJV              | Programming in Java   | Z,ZK                 | 6             |
|                       | in the basics of algorithms and programming from the first semester and introduces students to the Java environment. The course also  |                      |               |
|                       | e. The topics of the course includes exceptions, event handling, and building a graphical interface. Basic library methods, working wit<br>In important topic is models of multithreaded applications and their implementation. Practical exercises of practical skills and knowled     |                      |               |
|                       | sks and semester work, which will be submitted continuously through the source code version control system. The semester work sc  | -                    |               |
| or solving partial ta | 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 structure  |                      | -             |
| are developed. S      | tudents master the practical implementation of simple individual tasks. The course emphasizes acquiring programming habits for cre  | ating readable and   | reusable      |
| programs. 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 programmi    | ng language   |
|                       | 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 and   |                      |               |
|                       | lence is developed by a set of homework with the possibility of optional and bonus assignments. The final task is an integration of a la<br>olementations. Evaluation of coding style motivated by writing legible, understandable, and maintainable codes is also a part of the second |                      | ng existing   |
| B4B01DMA              | Discrete Mathematics  | Z,ZK                 | 5             |
|                       | nts meet some important topics from the field of discrete mathematics. Namely, they will explore divisibility and calculations modulo n,  | ,                    | 1             |
|                       | 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.   |                      |               |
| B4B17EAM              | Electromagnetism  | Z,ZK                 | 6             |
| The subject introdu   | uces the basics of electrical engineering, electromagnetic fields, and simple active/passive electronic circuits. We will also explore op   | tics, acoustics, and | d antennas.   |
| Emphasis is placed    | on understanding the physical principles behind these phenomena. During the lessons, we not only write on the board but also dem  | onstrate computer    | simulations   |
| D (D 0 0 D) (0        | and conduct small experiments.  |                      |               |
| B4B32PKS              | Computer and Communication Networks   | Z,ZK                 | 6             |
|                       | se is to familiarize students with current trends in the switched local networks and the key functions of routing protocols in IP networks.<br>Is to concepts of ensuring the information security in the communication networks. An integral part of the course is also an explanation | •                    |               |
|                       | quality of services in data networks and features of some file sharing application protocols. The course is aimed rather primarily practices in data networks and features of some file sharing application protocols.  |                      | •             |
| B4B33ALG              | Algorithms  | Z,ZK                 | 6             |
|                       | Igorithms development is constructed with minimum dependency to programming language; nevertheless the lectures and seminars  | ,                    | 1             |
|                       | ctures, 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.   |                      | -             |
| B4B33RPH              | Solving Problems and other Games  | KZ                   | 6             |
| The main motivat      | on is to let students to deal with real-world problems properly. When working on real problems the student shall learn how to decomp  | oose the big proble  | em, how to    |
|                       | how to test and validate individual steps and so on. Many problems will actually be beyond the first-year-student skills. And many pro  |                      |               |
|                       | insolved parts should motivate the students to study difficult theoretical subjects. They should generate the important questions. Idea   | -                    | -             |
| the student should    | be eager to study deeper about informatics. The course also explains the basis of the object oriented design, software testing, ways i  | or writing readable  | e and robust  |
| DAD250SV              | codes.  | 7 74                 | 4             |
| B4B35OSY              | Operating Systems<br>operation system's basic concepts and principles as processes, threads, communication and synchronization, virtual memory, driver  | Z,ZK                 | 4             |
|                       | ics are theoretically described and demonstrated on Linux and Windows OS with multi-core systems. Practical exercises from OS in  | -                    | -             |
|                       | be solved on labs. Students will work with Linux OS and micro-kernel NOVA.  |                      | 390 1111      |
| B4B35PSR              | Real-time Systems Programming   | Z,ZK                 | 6             |
|                       | burse is to provide students with basic knowledge about software development for real-time systems, for example in control and embe   |                      |               |
| -                     | 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 and  |                      |               |
|                       | s represent the typical criteria for assessing the suitability of a given platform for the given application. After the simple tasks, student   |                      | ex task of    |
| B4B36PDV              | itical motion control application which will require full utilization of RTOS features. All the tasks at the labs will be implemented in C (or Parallel and Distributed Computing   | Z,ZK                 | 6             |
|                       |   |                      |               |

| B4B38NVS             | Embedded Systems Design  | Z,ZK                   | 6               |
|----------------------|--|------------------------|-----------------|
|                      | The course deals with design of embedded systems using ARM based microcontrollers.   | 771                    | <i>г</i>        |
| B4B38PSIA            | Computer Networks  | Z,ZK                   | 5<br>6          |
| B4BPROJ6<br>BBAP20   | Unassisted project<br>Bachelor thesis  | Z<br>Z                 | 20              |
| BE4B33SEA            | Subject in english - abroad  | Z,ZK                   | 20              |
| BE4B333EA            | The subject serves for validation of the duty to complete at least one compulsory course of the program in English.  | ∠,∠۲                   | 0               |
| BE4B35PSR            | Real-time Systems Programming  | Z,ZK                   | 6               |
|                      | purse is to provide students with basic knowledge about software development for real-time systems, for example in control and embed   |                        | . The main      |
|                      | led systems equipped with a real-time operating system (RTOS). Lectures will cover real-time systems theory, which can be used to for  |                        |                 |
| -                    | nother 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<br>s represent the typical criteria for assessing the suitability of a given platform for the given application. After the simple tasks, student   |                        |                 |
|                      | ritical motion control application which will require full utilization of RTOS features. All the tasks at the labs will be implemented in C (  |                        |                 |
| BE4B36FUP            | Functional Programming   | Z,ZK                   | 6               |
| This course introdu  | ces students into the techniques of functional programming, the advantages and disadvantages of this programming paradigm, and its   | use in practice. Th    | is approach     |
|                      | e sense that the programmer symbolically describes the problem to be solved, rather than specifying the exact sequence of operation  | -                      |                 |
| -                    | ssence of the solved problem and implementing even more complex algorithms compactly. Functional programming has notable adva<br>ion 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 agent  | 0 0                    |                 |
|                      | 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 de  |                        |                 |
|                      | the field of artificial intelligence. More information is available at https://prg.ai/minor.   |                        |                 |
| BE4B36ZUI            | Introduction to Artificial Intelligence  | Z,ZK                   | 6               |
|                      | rse is to cover the basics of symbolic artificial intelligence. We will focus on algorithms of informed and uninformed state space searc   |                        |                 |
| <b>e</b> 1           | tation of knowledge using formal logic, methods of automated reasoning, and an introduction to Markov decision making, and to two-<br>nter-university programme prg.ai Minor. It pools the best of AI education in Prague to provide students with a deeper and broader ins  |                        |                 |
| also part of the h   | intelligence. More information is available at https://prg.ai/minor.   | Igni into the field of | i ai unciai     |
| BE4B38PSIA           | Computer Networks  | Z.ZK                   | 5               |
|                      | t o principles and technologies of Computer Networks. Physical layer media, analog and digital modulations, network topologies, MA   | I ' I                  | -               |
| data communicat      | ion models, coding and cryptography basics are introduced. Widely used LAN technologies are then presented together with their feat  | atures. Internet pro   | tocols are      |
|                      | explained and internetworking approaches are presented.  |                        |                 |
| BE4B39VGO            | Creating graphic content   | Z,ZK                   | 6               |
|                      | ourse is to provide theory behind geometric modeling and modeling of materials, give students an overview of methods used in the provide theory behaves a students will be a student will be a s |                        |                 |
| graphics and now to  | o apply those methods in praxis. At the seminars, students will learn how to design and create three-dimensional scene, create and ap<br>(e.g., wall finishes, wood, sky) and geometrical details, and position and set-up lights in the scene.  | ply textures imitatir  | ng materials    |
| 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 networks  | ı ' I                  | -               |
|                      | 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 observat  |                        |                 |
|                      | ng on the raining set. The course covers both well-established and advanced classifier learning methods, as Perceptron, AdaBoost, S  |                        |                 |
| Neural Nets. This of | 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<br>into the field of artificial intelligence. More information is available at https://prg.ai/minor.  | a deeper and broa      | ader insight    |
| BE5B35APO            | Computer Architectures   | Z,ZK                   | 6               |
|                      | s overview of basic building blocks of computer systems. Explanation starts from hardware side where it extends knowledge presente   |                        |                 |
|                      | 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 oper  | rating systems, dev    | vice drivers    |
| and virtualization   | techniques. General principles are more elaborated during presentation of examples of multiple standard CPU architectures. Exercise  |                        | ed on the       |
|                      | software view to the contrary. Students are lead from basic programming on CPU level to the interaction with raw hardware  |                        | <u>^</u>        |
| BE5B35LSP            | Logic Systems and Processors<br>Ices the basic hardware structures of computing resources, their design, and architecture. It provides an overview of the possibilities  | Z,ZK                   | 6<br>operations |
|                      | el and the design of embedded processor systems with peripherals on modern FPGA programmable logic circuits, which are increasing  |                        | -               |
|                      | cription in VHDL, from logic to more complex sequential circuits to practical finite state machine (FSM) designs. They will also master  |                        | -               |
| using circuit simula | ation. Practical problems are solved using development boards used at hundreds of leading universities around the world. The course  | ends with RISC-V       | / processor     |
|                      | structure, cache, and pipeline processing.   |                        |                 |
| BEZB                 | Safety in Electrical Engineering for a Bachelor's Degree   | Z                      | 0               |
|                      | safety course is to give the students basic knowledge of electrical equipment and installation as to avoid danger arising from operation<br>amentals of Safety Electrical Engineering. In this way the students receive qualification of instructed person that enables them to work   |                        | -               |
| 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  | I I                    | -               |
| -                    | 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   | -                      |                 |
|                      | regulations forms an integral and permanent part of qualification requirements. This program is obligatory.  |                        |                 |
| TV-V1                | Physical education   | Z                      | 1               |
| TVKLV                | Physical Education Course  | Z                      | 0               |
| TVKZV                | Physical Education Course  | Z                      | 0               |
| TVV                  | Physical education   | Z                      | 0               |
| TVV0                 | Physical education   | Z                      | 0               |
|                      |  |                        |                 |

For updated information see <u>http://bilakniha.cvut.cz/en/FF.html</u> Generated: day 2025-07-20, time 01:30.