# Study plan

## Name of study plan: Open Informatics - Internet of Things 2025

Faculty/Institute/Others: Faculty of Electrical Engineering
Department:
Branch of study guaranteed by the department: Welcome page
Garantor of the study branch:
Program of study: Open Informatics
Type of study: Bachelor full-time
Required credits: 163
Elective courses credits: 17
Sum of credits in the plan: 180
Note on the plan:

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Name of the block: Compulsory courses in the program
Minimal number of credits of the block: 133
The role of the block: P

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Code of the group: 2025_BOIBAP
Name of the group: Bachelor Project
Requirement credits in the group: In this group you have to gain 20 credits
Requirement courses in the group: In this group you have to complete 1 course
Credits in the group: 20
Note on the group:

| Code | Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* **authors** *and guarantors (gar.)* | Completion | Credits | Scope | Semester | Role |
|---|---|---|---|---|---|---|
| BBAP20 | **Bachelor thesis** *Roman mejla Roman mejla (Gar.)* | Z | 20 | 12S | L,Z | P |

**Characteristics of the courses of this group of Study Plan: Code=2025_BOIBAP Name=Bachelor Project**

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

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Code of the group: 2025_BOIBBE
Name of the group: Safety of the bachelor's studies
Requirement credits in the group:
Requirement courses in the group: In this group you have to complete at least 2 courses
Credits in the group: 0
Note on the group:

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

**Characteristics of the courses of this group of Study Plan: Code=2025_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. | | | | |

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Code of the group: 2025_BOIP
Name of the group: Compulsory subjects of the programme
Requirement credits in the group: In this group you have to gain 113 credits
Requirement courses in the group: In this group you have to complete 20 courses
Credits in the group: 113
Note on the group:

| Code | Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* **authors** *and guarantors (gar.)* | Completion | Credits | Scope | Semester | Role |
|---|---|---|---|---|---|---|
| B4B33ALG | **Algorithms** *Marko Genyk-Berezovskyj, Daniel Pr ša* **Daniel Pr ša** *Marko Genyk-Berezovskyj (Gar.)* | Z,ZK | 6 | 2P+2C | Z | P |
| B4B35APO | **Computer Architectures** | Z,ZK | 6 | 2P+2L | L | P |
| B4B36DBS | **Database Systems** | Z,ZK | 5 | 2P+2C | L | P |
| B4B01DMA | **Discrete Mathematics** *Petr Habala* **Petr Habala** *Petr Habala (Gar.)* | Z,ZK | 5 | 2P+2S | Z | P |
| B0B01LAG | **Linear Algebra** *Ji í Velebil, Jakub Rondoš, Natalie Žukovec, Daniel Gromada, Josef Dvo ák, Mat j Dostál* **Ji í Velebil** *Ji í Velebil (Gar.)* | Z,ZK | 8 | 4P+2S | Z | P |
| B0B01LGR | **Logic and Graphs** *Natalie Žukovec, Mat j Dostál, Alena Gollová* **Alena Gollová** *Marie Demlová (Gar.)* | Z,ZK | 5 | 3P+2S | Z,L | P |
| B0B01MA1 | **Mathematical Analysis 1** *Josef Dvo ák, Martin K epela, Josef Tkadlec, Veronika Sobotíková* **Josef Tkadlec** *Josef Tkadlec (Gar.)* | Z,ZK | 7 | 4P+2S | Z,L | P |
| B0B01MA2 | **Mathematical Analysis 2** *Miroslav Korbelá , Petr Hájek, Martin Bohata, Jaroslav Tišer, Karel Pospíšil, Paola Vivi, Hana Tur inová* **Petr Hájek** *Jaroslav Tišer (Gar.)* | Z,ZK | 7 | 4P+2S | L,Z | P |
| B4B33OSY | **Operating Systems** *Petr Št pán* | Z,ZK | 4 | 2P+2C | Z | P |
| B4B35OSY | **Operating Systems** *Michal Sojka, Petr Št pán* **Michal Sojka** *Michal Sojka (Gar.)* | Z,ZK | 4 | 2P+2C | Z | P |
| B0B33OPT | **Optimization** *Tomáš Werner, Petr Olšák, Mirko Navara, Tomáš Kroupa* **Tomáš Werner** *Tomáš Werner (Gar.)* | Z,ZK | 7 | 4P+2C | Z,L | P |
| B4B36PDV | **Parallel and Distributed Computing** *Mat j Kafka, Michal Jakob* **Michal Jakob** *Michal Jakob (Gar.)* | Z,ZK | 6 | 2P+2C | L | P |
| B4B38PSIB | **Computer Networks** | Z,ZK | 6 | 2P+2L | L | P |
| B4B33PSY | **Computer systems** *Petr Št pán* | KZ | 5 | 2P+2C | Z | P |
| B0B01PST | **Probability and Statistics** *Kate ina Helisová* **Kate ina Helisová** *Petr Hájek (Gar.)* | Z,ZK | 7 | 4P+2S | Z | P |
| B0B36PRP | **Procedural Programming** *Jan Faigl* **Jan Faigl** *Jan Faigl (Gar.)* | Z,ZK | 6 | 2P+2C | Z | P |
| B0B36PJV | **Programming in Java** *Ji í Vok ínek, Martin Mudroch, Ladislav Serédi* **Ji í Vok ínek** *Ji í Vok ínek (Gar.)* | Z,ZK | 6 | 2P+3C+7D | L | P |
| B4B36PKT | **P íprava ke státnicím** *Jan Faigl* | Z | 1 | 8P+8S | L | P |
| B4B33RPH | **Solving Problems and other Games** *Tomáš Svoboda, Petr Pošík* **Petr Pošík** *Tomáš Svoboda (Gar.)* | KZ | 6 | 2P+3C | Z | P |
| B4BPROJ6 | **Unassisted project** *Tomáš Svoboda, Petr Pošík, Ji í Šebek, Jaroslav Sloup, Ivan Jelínek, Katarína Žmolíková* **Petr Pošík** | Z | 6 | 0+2 | Z,L | P |

**Characteristics of the courses of this group of Study Plan: Code=2025_BOIP Name=Compulsory subjects of the programme**

| B4B33ALG | Algorithms | | Z,ZK | 6 |
|---|---|---|---|---|
| In the course, the algorithms development is constructed with minimum dependency to programming language; nevertheless the lectures and seminars are based on Java. Basic data types a data structures, basic algorithms, recursive functions, abstract data types, stack, queues, trees, searching, sorting, special application algorithms, Dynamic programming. Students are able to design and construct non-trivial algorithms and to evaluate their effectivity. | | | | |
| B4B35APO | Computer Architectures | | Z,ZK | 6 |
| B4B36DBS | Database Systems | | Z,ZK | 5 |
| B4B01DMA | Discrete Mathematics | | Z,ZK | 5 |
| In this course students meet some important topics from the field of discrete mathematics. Namely, they will explore divisibility and calculations modulo n, diophantine equations, binary relations, mappings, cardinality of sets, induction, and recurrence equations. The second aim of this course is to teach students the language of mathematics, both passively and actively, and introduce them to mathematics as science. | | | | |
| B0B01LAG | Linear Algebra | | Z,ZK | 8 |
| The course covers the initial parts of linear algebra. Firstly, the basic notions of a linear space and linear mappings are covered (linear dependence and independence, basis, coordinates, etc). The calculus of matrices (determinants, inverse matrices, matrices of a linear map, eigenvalues and eigenvectors, diagonalisation, etc) is covered next. The applications include solving systems of linear equations, the geometry of a 3D space (including the scalar product and the vector product) and SVD. | | | | |

| B0B01LGR | Logic and Graphs | | Z,ZK | 5 |
|---|---|---|---|---|
| This course covers basics of mathematical logic and graph theory. Syntax and semantics of propositional and predicate logic are introduced. The importance of the notion of consequence and of the relationship between a formula and its model is stressed. Further, basic notions from graph theory are introduced. | | | | |
| B0B01MA1 | Mathematical Analysis 1 | | Z,ZK | 7 |
| The aim of the course is to introduce students to basics of differential and integral calculus of functions of one variable. | | | | |
| B0B01MA2 | Mathematical Analysis 2 | | Z,ZK | 7 |
| The subject covers an introduction to the differential and integral calculus in several variables and basic relations between curve and surface integrals. Other part contains function series and power series with application to Taylor and Fourier series. | | | | |
| B4B33OSY | Operating Systems | | Z,ZK | 4 |
| Lecture introduces operation system's basic concepts and principles as processes, threads, communication and synchronization, virtual memory, drivers, file systems, basic security aspects. These topics are theoretically described and demonstrated on Linux and Windows OS with multi-core systems. Practical exercises from OS in C programming language will be solved on labs. Students will work with Linux OS and micro-kernel NOVA. | | | | |
| B4B35OSY | Operating Systems | | Z,ZK | 4 |
| Lecture introduces operation system's basic concepts and principles as processes, threads, communication and synchronization, virtual memory, drivers, file systems, basic security aspects. These topics are theoretically described and demonstrated on Linux and Windows OS with multi-core systems. Practical exercises from OS in C programming language will be solved on labs. Students will work with Linux OS and micro-kernel NOVA. | | | | |
| B0B33OPT | Optimization | | Z,ZK | 7 |
| The course provides an introduction to mathematical optimization, specifically to optimization in real vector spaces of finite dimension. The theory is illustrated with a number of examples. You will refresh and extend many topics that you know from linear algebra and calculus courses. | | | | |
| B4B36PDV | Parallel and Distributed Computing | | Z,ZK | 6 |
| B4B38PSIB | Computer Networks | | Z,ZK | 6 |
| B4B33PSY | Computer systems | | KZ | 5 |
| B0B01PST | Probability and Statistics | | Z,ZK | 7 |
| B0B36PRP | Procedural Programming | | Z,ZK | 6 |
| The course accompanies basic programming emphasizing the data representation in computer memory. Furthermore, the concepts of linked data structures and processing user inputs are developed. Students master the practical implementation of simple individual tasks. The course emphasizes acquiring programming habits for creating readable and reusable programs. At the same time, the effort is to build students an overview of the program operation, data model, memory access, and management. Therefore, the C programming language is used that provides a direct link between the program data structures and their representation in the computer memory. Students will get acquainted not only with program compilation and linking but also with debugging and profiling. Labs aim to acquire practical skills of implementing simple individual tasks, emphasizing functionality and accuracy of implementation. Student independence is developed by a set of homework with the possibility of optional and bonus assignments. The final task is an integration of a larger program using existing implementations. Evaluation of coding style motivated by writing legible, understandable, and maintainable codes is also a part of the selected tasks. | | | | |
| B0B36PJV | Programming in Java | | Z,ZK | 6 |
| The course builds on the basics of algorithms and programming from the first semester and introduces students to the Java environment. The course also focus on the object concept of the Java language. The topics of the course includes exceptions, event handling, and building a graphical interface. Basic library methods, working with files and using generic types will be introduced. An important topic is models of multithreaded applications and their implementation. Practical exercises of practical skills and knowledge of Java is tested in the form of solving partial tasks and semester work, which will be submitted continuously through the source code version control system. The semester work scoring consists of points for the correctness and efficiency of the code, as well as points that take into account the quality of the source codes, their readability and reusability. | | | | |
| B4B36PKT | P íprava ke státnicím | | Z | 1 |
| B4B33RPH | Solving Problems and other Games | | KZ | 6 |
| The main motivation is to let students to deal with real-world problems properly. When working on real problems the student shall learn how to decompose the big problem, how to define interfaces, how to test and validate individual steps and so on. Many problems will actually be beyond the first-year-student skills. And many problem will not be solved in the optimal way. The unsolved parts should motivate the students to study difficult theoretical subjects. They should generate the important questions. Ideally, at the end of the subject, the student should be eager to study deeper about informatics. The course also explains the basis of the object oriented design, software testing, ways for writing readable and robust codes. | | | | |
| B4BPROJ6 | Unassisted project | | Z | 6 |

Code of the group: 2025_BZAJ

Name of the group: Exam from the english language

Requirement credits in the group:

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

Credits in the group: 0

Note on the group:

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

**Characteristics of the courses of this group of Study Plan: Code=2025_BZAJ Name=Exam from the english language**

| B0B04B1K | English language B1 - classified assessment | | KZ | 0 |
|---|---|---|---|---|
| verifying of the student´s skills of B1 level | | | | |

| B0B04B2Z | English language B2 - exam | Z,ZK | 0 |
|---|---|---|---|

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

## Name of the block: Povinné p edm ty zam ení
Minimal number of credits of the block: 30
The role of the block: PZ

Code of the group: 2025_BOIPS2
Name of the group: Compulsory subjects of the branch
Requirement credits in the group: In this group you have to gain 30 credits
Requirement courses in the group: In this group you have to complete 5 courses
Credits in the group: 30
Note on the group:               Specializace - Internet věcí

| Code | Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* **authors** *and guarantors (gar.)* | Completion | Credits | Scope | Semester | Role |
|---|---|---|---|---|---|---|
| B4B17EAM | **Electromagnetism** *Zbyn k Škvor, Pavel Hazdra* **Jan Kra ek** *Zbyn k Škvor (Gar.)* | Z,ZK | 6 | 2P+2C | Z | PZ |
| B0B35LSP | **Logic systems and processors** *Richard Šusta, Martin Hlinovský* **Martin Hlinovský** *Zden k Hurák (Gar.)* | Z,ZK | 6 | 2P+2L | L | PZ |
| B4B38NVS | **Embedded Systems Design** *Jan Fischer, Vojt ch Petrucha* **Jan Fischer** *Jan Fischer (Gar.)* | Z,ZK | 6 | 2P+2L | Z | PZ |
| B4B32PKS | **Computer and Communication Networks** *Leoš Bohá , Tomáš Van k* **Ivan Pravda** *Leoš Bohá (Gar.)* | Z,ZK | 6 | 2P + 2C | L | PZ |
| B4B38PSR | **Real-time Systems Programming** **Michal Sojka** | Z,ZK | 6 | 2P+2C | Z | PZ |

**Characteristics of the courses of this group of Study Plan: Code=2025_BOIPS2 Name=Compulsory subjects of the branch**

| B4B17EAM | Electromagnetism | Z,ZK | 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.

| B0B35LSP | Logic systems and processors | Z,ZK | 6 |
|---|---|---|---|

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

| B4B38PSR | Real-time Systems Programming | Z,ZK | 6 |
|---|---|---|---|

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

## Name of the block: Elective courses
Minimal number of credits of the block: 0
The role of the block: V

Code of the group: 2025_BOIH
Name of the group: Humanities subjects
Requirement credits in the group:

Requirement courses in the group:

Credits in the group: 0

Note on the group:

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

**Characteristics of the courses of this group of Study Plan: Code=2025_BOIH Name=Humanities subjects**

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

Code of the group: 2025_BJKA

Name of the group: English language courses

Requirement credits in the group:

Requirement courses in the group:

Credits in the group: 0

Note on the group:

| Code | Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors, **authors** and guarantors (gar.)* | Completion | Credits | Scope | Semester | Role |
|---|---|---|---|---|---|---|
| B0B04A21 | **English Language A2-1** *Dana Saláková* | Z | | 2s | Z | V |
| B0B04A22 | **English Language A2-2** *Dana Saláková* | Z | 0 | 2s | L | V |
| B0B04B11 | **English Language B1-1** *Petra Juna Jennings Petra Juna Jennings (Gar.)* | Z | 0 | 2C | Z | V |
| B0B04B12 | **English Language B1-2** *Petra Juna Jennings Petra Juna Jennings (Gar.)* | Z | 0 | 2C | L | V |
| B0B04B21 | **English Language B2-1** *Petra Juna Jennings Petra Juna Jennings (Gar.)* | Z | 3 | 2C | Z | V |
| B0B04B22 | **English Language B2-2** *Petra Juna Jennings Petra Juna Jennings (Gar.)* | Z | 3 | 2C | Z,L | V |

**Characteristics of the courses of this group of Study Plan: Code=2025_BJKA Name=English language courses**

| B0B04A21 | English Language A2-1 | Z | |
|---|---|---|---|
| The course is open to students who are beginners in their second language. Course objective: Achieving competence in basic English. | | | |
| B0B04A22 | English Language A2-2 | Z | 0 |
| The course is open to students who are beginners in their second foreign language. The course objective is to develop and sustain their basic knowledge of the English language. | | | |

| B0B04B11 | English Language B1-1 | | Z | 0 |
|---|---|---|---|---|

Course objective: Broadening the basic knowledge of general English; mastering basic specialised language; focusing on text analysis and vocabulary expansion; understanding spoken English.

| B0B04B12 | English Language B1-2 | | Z | 0 |
|---|---|---|---|---|

Course objective: Broadening the basic knowledge of general English; mastering basic specialised language; focusing on text analysis and vocabulary expansion; understanding 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 B2 - zkouška - B0B04B2Z*). While the course is focused on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), it also focuses more on the academic and technical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriate level of English for Erasmus / International Study.

| B0B04B22 | English Language B2-2 | | Z | 3 |
|---|---|---|---|---|

This course is designed as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - zkouška - B0B04B2Z *). While the course is focused on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), it also focuses more on the academic and technical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriate level of English for Erasmus / International Study.

Code of the group: BTV
Name of the group: Physical education
Requirement credits in the group:
Requirement courses in the group:
Credits in the group: 0
Note on the group:

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

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

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

Code of the group: BTVK
Name of the group: Physical education courses
Requirement credits in the group:
Requirement courses in the group:
Credits in the group: 0
Note on the group:

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

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

| TVKLV | Physical Education Course | | Z | 0 |
|---|---|---|---|---|
| TVKZV | Physical Education Course | | Z | 0 |

Code of the group: 2025_BOIVOL
Name of the group: Elective subjects
Requirement credits in the group:
Requirement courses in the group:
Credits in the group: 0
Note on the group:            ~Nabídku volitelných předmětů uspořádaných podle kateder najdete na webových stránkách http://www.fel.cvut.cz/cz/education/volitelne-predmety.html\\

# List of courses of this pass:

| Code | Name of the course | Completion | Credits |
|------|-------------------|------------|---------|
| B0B01LAG | Linear Algebra | Z,ZK | 8 |
| The course covers the initial parts of linear algebra. Firstly, the basic notions of a linear space and linear mappings are covered (linear dependence and independence, basis, coordinates, etc). The calculus of matrices (determinants, inverse matrices, matrices of a linear map, eigenvalues and eigenvectors, diagonalisation, etc) is covered next. The applications include solving systems of linear equations, the geometry of a 3D space (including the scalar product and the vector product) and SVD. | | | |
| B0B01LGR | Logic and Graphs | Z,ZK | 5 |
| This course covers basics of mathematical logic and graph theory. Syntax and semantics of propositional and predicate logic are introduced. The importance of the notion of consequence and of the relationship between a formula and its model is stressed. Further, basic notions from graph theory are introduced. | | | |
| B0B01MA1 | Mathematical Analysis 1 | Z,ZK | 7 |
| The aim of the course is to introduce students to basics of differential and integral calculus of functions of one variable. | | | |
| B0B01MA2 | Mathematical Analysis 2 | Z,ZK | 7 |
| The subject covers an introduction to the differential and integral calculus in several variables and basic relations between curve and surface integrals. Other part contains function series and power series with application to Taylor and Fourier series. | | | |
| B0B01PST | Probability and Statistics | Z,ZK | 7 |
| B0B04A21 | English Language A2-1 | Z | |
| The course is open to students who are beginners in their second language. Course objective: Achieving competence in basic English. | | | |
| B0B04A22 | English Language A2-2 | Z | 0 |
| The course is open to students who are beginners in their second foreign language. The course objective is to develop and sustain their basic knowledge of the English language. | | | |
| B0B04B11 | English Language B1-1 | Z | 0 |
| Course objective: Broadening the basic knowledge of general English; mastering basic specialised language; focusing on text analysis and vocabulary expansion; understanding spoken English. | | | |
| B0B04B12 | English Language B1-2 | Z | 0 |
| Course objective: Broadening the basic knowledge of general English; mastering basic specialised language; focusing on text analysis and vocabulary expansion; understanding spoken English. | | | |
| B0B04B1K | English language B1 - classified assessment | KZ | 0 |
| verifying of the student´s skills of B1 level | | | |
| 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 B2 - zkouška - B0B04B2Z*). While the course is focused on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), it also focuses more on the academic and technical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriate level of English for Erasmus / International Study. | | | |
| B0B04B22 | English Language B2-2 | Z | 3 |
| This course is designed as a full-year, two semester preparation course for the universitys compulsory B2-level English Examination (Anglický jazyk B2 - zkouška - B0B04B2Z *). While the course is focused on helping students reach a level required to pass the B2-level English Examination (or improve their English for a higher mark), it also focuses more on the academic and technical vocabulary and grammar expected of students at the university level. *NOTE: This exam is also used for determining an appropriate level of English for Erasmus / International Study. | | | |
| B0B04B2Z | English language B2 - exam | Z,ZK | 0 |
| I) The B2 English Exam is a compulsory subject for all Faculty of Electrical Engineering students at the Czech Technical University. According to the Study and Examination Rules and Regulations for Students at CTU (Part III, Article 4), a compulsory subject is one whose completion is a necessary condition in order to successfully complete the study programme. In addition, this requires the passing of an examination evaluated on the scale A, B, C, D, or E (SERR Part III, Article 6). II) According to the Common European Framework of Reference for Languages (CEFR), an international standard for describing language ability, the definition of an English language learner who has achieved the B2 (Upper-Intermediate) level is one who can understand the main ideas of complex text on both concrete and abstract topics, including technical discussions in his/her field of specialisation. Can interact with a degree of fluency and spontaneity that makes regular interaction with native speakers quite possible without strain for either party. Can produce clear, detailed text on a wide range of subjects and explain a viewpoint on a topical issue giving the advantages and disadvantages of various options. III) Students who have successfully passed an approved international exam within the past five years may present their certificate to the Department of Languages, Faculty of Electrical Engineering.Upon approval, students are then exempt from both the Written Test and the Oral Part. For a list of approved international exams go the department website: http://jazyky.fel.cvut.cz/ | | | |
| B0B16ET1 | Ethic 1 | KZ | 4 |
| Aim of this subject is to provide the students an orientation not only in general problems of ethics but above all to offer instructions for solving various situations of human life. Essential parts of the subject are discussions in which students can react to lectures but also to actual questions coming with news and look for the communal answers. | | | |
| B0B16FI1 | Philosophy 1 | KZ | 4 |
| We deal with the most important persons, schools and ideas of ancient philosophy. We are concerned especially on transdisciplinary nature of philosophy and connection of old philosophical thoughts with recent problems of science, technology, economics and politics. | | | |
| B0B16FIL | Philosophy | ZK | 2 |
| We deal with the most important persons, schools and ideas of ancient philosophy. We are concerned especially on transdisciplinary nature of philosophy and connection 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 provides an introduction to mathematical optimization, specifically to optimization in real vector spaces of finite dimension. The theory is illustrated with a number of examples. You will refresh and extend many topics that you know from linear algebra and calculus courses. | | | |

| B0B35LSP | Logic systems and processors | Z,ZK | 6 |
|---|---|---|---|
| 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] ||||
| B0B36PJV | Programming in Java | Z,ZK | 6 |
| The course builds on the basics of algorithms and programming from the first semester and introduces students to the Java environment. The course also focus on the object concept of the Java language. The topics of the course includes exceptions, event handling, and building a graphical interface. Basic library methods, working with files and using generic types will be introduced. An important topic is models of multithreaded applications and their implementation. Practical exercises of practical skills and knowledge of Java is tested in the form of solving partial tasks and semester work, which will be submitted continuously through the source code version control system. The semester work scoring consists of points for the correctness and efficiency of the code, as well as points that take into account the quality of the source codes, their readability and reusability. ||||
| B0B36PRP | Procedural Programming | Z,ZK | 6 |
| The course accompanies basic programming emphasizing the data representation in computer memory. Furthermore, the concepts of linked data structures and processing user inputs are developed. Students master the practical implementation of simple individual tasks. The course emphasizes acquiring programming habits for creating readable and reusable programs. At the same time, the effort is to build students an overview of the program operation, data model, memory access, and management. Therefore, the C programming language is used that provides a direct link between the program data structures and their representation in the computer memory. Students will get acquainted not only with program compilation and linking but also with debugging and profiling. Labs aim to acquire practical skills of implementing simple individual tasks, emphasizing functionality and accuracy of implementation. Student independence is developed by a set of homework with the possibility of optional and bonus assignments. The final task is an integration of a larger program using existing implementations. Evaluation of coding style motivated by writing legible, understandable, and maintainable codes is also a part of the selected tasks. ||||
| B4B01DMA | Discrete Mathematics | Z,ZK | 5 |
| In this course students meet some important topics from the field of discrete mathematics. Namely, they will explore divisibility and calculations modulo n, diophantine equations, binary relations, mappings, cardinality of sets, induction, and recurrence equations. The second aim of this course is to teach students the language of mathematics, both passively and actively, and introduce them to mathematics as science. ||||
| B4B17EAM | Electromagnetism | Z,ZK | 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. ||||
| 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 ||||
| B4B33ALG | Algorithms | Z,ZK | 6 |
| In the course, the algorithms development is constructed with minimum dependency to programming language; nevertheless the lectures and seminars are based on Java. Basic data types a data structures, basic algorithms, recursive functions, abstract data types, stack, queues, trees, searching, sorting, special application algorithms, Dynamic programming. Students are able to design and construct non-trivial algorithms and to evaluate their effectivity. ||||
| B4B33OSY | Operating Systems | Z,ZK | 4 |
| Lecture introduces operation system's basic concepts and principles as processes, threads, communication and synchronization, virtual memory, drivers, file systems, basic security aspects. These topics are theoretically described and demonstrated on Linux and Windows OS with multi-core systems. Practical exercises from OS in C programming language will be solved on labs. Students will work with Linux OS and micro-kernel NOVA. ||||
| B4B33PSY | Computer systems | KZ | 5 |
| B4B33RPH | Solving Problems and other Games | KZ | 6 |
| The main motivation is to let students to deal with real-world problems properly. When working on real problems the student shall learn how to decompose the big problem, how to define interfaces, how to test and validate individual steps and so on. Many problems will actually be beyond the first-year-student skills. And many problem will not be solved in the optimal way. The unsolved parts should motivate the students to study difficult theoretical subjects. They should generate the important questions. Ideally, at the end of the subject, the student should be eager to study deeper about informatics. The course also explains the basis of the object oriented design, software testing, ways for writing readable and robust codes. ||||
| B4B35APO | Computer Architectures | Z,ZK | 6 |
| B4B35OSY | Operating Systems | Z,ZK | 4 |
| Lecture introduces operation system's basic concepts and principles as processes, threads, communication and synchronization, virtual memory, drivers, file systems, basic security aspects. These topics are theoretically described and demonstrated on Linux and Windows OS with multi-core systems. Practical exercises from OS in C programming language will be solved on labs. Students will work with Linux OS and micro-kernel NOVA. ||||
| B4B36DBS | Database Systems | Z,ZK | 5 |
| B4B36PDV | Parallel and Distributed Computing | Z,ZK | 6 |
| B4B36PKT | P íprava ke státnicím | Z | 1 |
| B4B38NVS | Embedded Systems Design | Z,ZK | 6 |
| The course deals with design of embedded systems using ARM based microcontrollers. ||||
| B4B38PSIB | Computer Networks | Z,ZK | 6 |
| B4B38PSR | Real-time Systems Programming | Z,ZK | 6 |
| The goal of this course is to provide students with basic knowledge about software development for real-time systems, for example in control and embedded applications. The main focus is on embedded systems equipped with a real-time operating system (RTOS). Lectures will cover real-time systems theory, which can be used to formally verify timing correctness such systems. Another set of lectures will introduce methods and techniques used for development of safety-critical systems, whose failure may have catastrophic consequences. During labs, students will first solve a few simple tasks to familiarize them with basic components of VxWorks RTOS and to benchmark the used OS and hardware (Xilinx Zynq). The obtained metrics represent the typical criteria for assessing the suitability of a given platform for the given application. After the simple tasks, students will solve complex task of time-critical motion control application which will require full utilization of RTOS features. All the tasks at the labs will be implemented in C (or C++) language. ||||
| B4BPROJ6 | Unassisted project | Z | 6 |
| BBAP20 | Bachelor thesis | Z | 20 |
| 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. | | | |
| 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  http://bilakniha.cvut.cz/en/f3.html
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