Study plan

Name of study plan: Software Engineering and Technology

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: Software Engineering and Technology
Type of study: Bachelor full-time
Required credits: 166
Elective courses credits: 14
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: 137
The role of the block: P

Code of the group: 2021_BSITBAP
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 Čmejla Roman Čmejla (Gar.)*	Z	20	12S	L,Z	P

Characteristics of the courses of this group of Study Plan: Code=2021_BSITBAP Name=Bachelor Project

BBAP20	Bachelor thesis	Z	20

Code of the group: 2021_BSITBBE
Name of the group: Safety of the bachelor's studies
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
BEZB	**Safety in Electrical Engineering for a Bachelor´s Degree** *Ivana Nová, Radek Havlíček, Vladimír Kůla **Radek Havlíček** Vladimír Kůla (Gar.)*	Z	0	2BP+2BC	Z,L	P
BEZZ	**Basic Health and Occupational Safety Regulations** *Ivana Nová, Radek Havlíček, Vladimír Kůla **Radek Havlíček** Vladimír Kůla (Gar.)*	Z	0	2BP+2BC	Z	P

Characteristics of the courses of this group of Study Plan: Code=2021_BSITBBE 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: 2021_BSITP
Name of the group: Compulsory subjects of the programme
Requirement credits in the group: In this group you have to gain 117 credits
Requirement courses in the group: In this group you have to complete 22 courses
Credits in the group: 117
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
B0B36DBS	**Database Systems** *Martin Řimnáč, Václav Kratochvíl* ***Martin Řimnáč*** *Martin Řimnáč (Gar.)*	Z,ZK	6	2P+2C+4D	L	P
B6B36DSA	**Data Structures and Algorithms** *Karel Richta, Jan Drchal* ***Karel Richta*** *Karel Richta (Gar.)*	Z,ZK	6	2P+3C+3D	L	P
B6B16INS	**Information Systems** *Pavel Náplava, Jan Kočí* ***Pavel Náplava*** *Pavel Náplava (Gar.)*	KZ	4	2P+2S+3D	L	P
B0M32KSB	**Cryptography and Network Security** *Tomáš Vaněk* ***Ivan Pravda*** *Tomáš Vaněk (Gar.)*	Z,ZK	6	2P+2L+4D	Z	P
B6B01LAG	**Linear Algebra** *Jiří Velebil, Jakub Rondoš, Daria Pavlova* ***Jiří Velebil*** *Jiří Velebil (Gar.)*	Z,ZK	7	4P+2C+2D	L	P
B6B01MAA	**Mathematics Analysis** *Natalie Žukovec, Karel Pospíšil* ***Natalie Žukovec*** *Natalie Žukovec (Gar.)*	Z,ZK	5	2P+2S+2D	Z	P
B6B36NSS	**Design of Software Systems** *Jiří Šebek* ***Jiří Šebek*** *Jiří Šebek (Gar.)*	Z,ZK	5	2P+2C+2D	L	P
B6B36OMO	**Object-oriented design and Modeling** *David Kadleček* ***David Kadleček*** *David Kadleček (Gar.)*	Z,ZK	6	2P+2C+4D	Z	P
B6B32PSI	**Computer Networks** *Tomáš Vaněk, Zbyněk Kocur, Leoš Boháč* ***Ján Kučerák*** *Leoš Boháč (Gar.)*	Z,ZK	5	2P + 2C + 3D	Z	P
B6B36PCC	**Programming in C/C++** *Radek Havlíček, Ingrid Nagyová, Karel Richta, Petr Ryšavý* ***Karel Richta*** *Karel Richta (Gar.)*	Z,ZK	5	2P+2C+4D	Z	P
B0B36PJV	**Programming in Java** *Jiří Vokřínek, Martin Mudroch, Ladislav Serédi* ***Jiří Vokřínek*** *Jiří Vokřínek (Gar.)*	Z,ZK	6	2P+3C+7D	L	P
B6B36PM2	**Management of Software Projects** *Miroslav Bureš* ***Miroslav Bureš*** *Miroslav Bureš (Gar.)*	KZ	4	2P+2C+2D	Z	P
B6B36SMP	**Analysis and Modeling of Software Requirements** *Martin Komárek* ***Martin Komárek*** *Martin Komárek (Gar.)*	Z,ZK	6	2P+3C+3D	L	P
B6BPROJ6	**Semestral Project** *Jiří Šebek, Jaroslav Sloup, Petr Pošík* ***Jaroslav Sloup*** *Jaroslav Sloup (Gar.)*	Z	6	2s	L,Z	P
B6B01PRA	**Statistics and Probability** *Jakub Staněk, Kateřina Helisová* ***Kateřina Helisová*** *Kateřina Helisová (Gar.)*	Z,ZK	5	2P+2S+1D	L	P
B6B36TS1	**Software Testing** *Miroslav Bureš, Avetis Mkrtchian* ***Miroslav Bureš*** *Miroslav Bureš (Gar.)*	Z,ZK	5	2P+2C+2D	L	P
B0B36ZAL	**Introduction to Programming** *Jiří Vokřínek* ***Jiří Vokřínek*** *Jiří Vokřínek (Gar.)*	Z,ZK	6	2P+2C+8D	Z	P
B6B01ZDM	**Introduction to Discrete Mathematics** *Jaroslav Tišer* ***Jaroslav Tišer*** *Jaroslav Tišer (Gar.)*	Z,ZK	5	2P+2S+2D	Z	P
B6B39ZMT	**Foundations of Multimedia Production** *Roman Berka, František Rund* ***Roman Berka*** *Roman Berka (Gar.)*	KZ	3	4P+4L+2D	Z	P
B6B38ZPS	**Basics of Computer Systems** *Jiří Novák* ***Jiří Novák*** *Jiří Novák (Gar.)*	Z,ZK	6	4P+2L+2D	Z	P
B6B36ZSO	**Introduction to Project Management** *Pavel Náplava, Martin Dobiáš, Jitka Pinková* ***Pavel Náplava*** *Pavel Náplava (Gar.)*	KZ	5	2P+2C+5D	Z	P
B6B39ZWA	**Foundations of Web Applications** *Martin Klíma, Martin Mudra* ***Martin Klíma*** *Martin Klíma (Gar.)*	Z,ZK	5	2P+2C+3D	Z	P

Characteristics of the courses of this group of Study Plan: Code=2021_BSITP Name=Compulsory subjects of the programme

B0B36DBS	Database Systems	Z,ZK	6

The course is designed as a basic database course mainly aimed at the student ability to design a relational data model and to use the SQL language for data definition as well as for data querying and to choose the appropriate degree of transaction isolation. Students will also get acquainted with the most commonly used indexing techniques, database system architecture and their management. They will verify their knowledge during the elaboration of a continuously submitted seminar task.

B6B36DSA	Data Structures and Algorithms	Z,ZK	6
B6B16INS	Information Systems	KZ	4

The goal of this course is to familiarise students with the information systems topic and information systems implementation principles. During the course, students are introduced to "on the market" existing types of systems and their usage in specific industry segments. Students are familiarised with the CRM, ERP, MRP and other types of information systems. The fundamental part of the course is the introduction to key ideas of an information system selection, evaluation of information system benefits, ways of information systems implementation and information system implementation based on the project management principles. The emphasis is on the initial customer analysis, customer insight and ability to decide whether it is better to implement any existing information system or to develop a new one from scratch. These factors determine the information system implementation success. At the end of the course information systems security, operation, support, maintenance, legislation impacts, and government information systems topics are discussed.

B0M32KSB	Cryptography and Network Security	Z,ZK	6
The Information Security course provides a complete source of information on the field of security of information systems and information technologies. The most of information in today society is created, transferred, stored in electronic form so information security is very important part of it. Technical background for information security is provided by cryptology.			
B6B01LAG	Linear Algebra	Z,ZK	7
B6B01MAA	Mathematics Analysis	Z,ZK	5
This course is an introduction to differential and integral calculus. It covers basic properties of functions, limits of functions, derivative and its applications (graphing, Taylor polynomial) and definite/indefinite integral with its applications, sequences and series.			
B6B36NSS	Design of Software Systems	Z,ZK	5
B6B36OMO	Object-oriented design and Modeling	Z,ZK	6
B6B32PSI	Computer Networks	Z,ZK	5
B6B36PCC	Programming in C/C++	Z,ZK	5
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.			
B6B36PM2	Management of Software Projects	KZ	4
B6B36SMP	Analysis and Modeling of Software Requirements	Z,ZK	6
This course covers the topic of requirements engineering. Their gathering, analysis, documentation, management, ... Students also will gain knowledge on using the most widely spread graphic notation - UML.			
B6BPROJ6	Semestral Project	Z	6
Individual or team work in form of a project. Student selects the subject of their project from the list of topics relevant to the studied specialization and provided by the specific department/departments. The project's subject can be closely related to the future Bachelor thesis. Further instructions for the selection and resolution of the projects can be found on the web pages of the selected department. Within this course the project is also defended.			
B6B01PRA	Statistics and Probability	Z,ZK	5
The students will be introduced to the theory of probability and mathematical statistics, namely to the basic computing methods and their applications in practice. The course covers the basic parts of probability and mathematical statistics. The first part is focused on classical probability, including conditional probability. The next part deals with the theory of random variables and their distributions, examples of the most important types of discrete and continuous distributions, numerical characteristics of random variables, their independence, sums and transformations. Probabilistic knowledge is then used in the description of statistical methods for estimating distribution parameters and testing hypotheses.			
B6B36TS1	Software Testing	Z,ZK	5
B0B36ZAL	Introduction to Programming	Z,ZK	6
B6B01ZDM	Introduction to Discrete Mathematics	Z,ZK	5
No advanced knowleges of mathematics are required at the beginning of this course. Using illustrative examples we build sufficient understanding of combinatorics, set and graph theory. Then we proceed to a brief formal construction of predicate calculus.			
B6B39ZMT	Foundations of Multimedia Production	KZ	3
The course familiarizes students with the basic principles of acquisition and processing of multimedia content, with a focus on image processing, video and audio, as well as the principles of graphic design and its implementation in a web environment. The course is organized within the block teaching when, within four days, students gradually pass each section of the course divided into two lectures and two workshops each day. Students will acquire the practical principles in the acquisition and processing of multimedia content while they use several different types of instruments at the application level and at the level of simple code. All students will apply the knowledge gained within the last day dedicated to composition rules within a Web project. After completing the course, students will carry out their own independent project and after its submission will be assessed.			
B6B38ZPS	Basics of Computer Systems	Z,ZK	6
The first topic introduces students to the basic concepts of computer technology and computer networks. The following lectures are focused on digital technology, internal structure and function of the processor and its instruction set. Common and special architectures and specialized instruction sets, ways to increase processor performance and their limits will be introduced. The computer architecture description, memories and their categorization in terms of functional principles and application use will be based on this knowledge. The following lectures are focused on getting acquainted with operating systems, multitasking, inter-process communication and synchronization, resource management and virtualization. The next lecture will deal with the computer networks - first in general (OSI model) and then more specifically with an introduction to TCP / IP protocols. Further the disk (mass storage) subsystem will be described in more detail, including disk partitioning, file systems, and access rights. Finally the basics of electronics and optoelectronics, typical problems motivating students to further deepen their knowledge in this area through self-study will be introduced.			
B6B36ZSO	Introduction to Project Management	KZ	5
Students are introduced to the basics of project management, which can be used not only in the field of IT projects. Students will also gain practical experience and knowledge in the area of teamwork (e.g. planning, team organization) and basics of legal and economic aspects of the project. The course also includes an introduction to presentation skills.			
B6B39ZWA	Foundations of Web Applications	Z,ZK	5
The subject is focussing on the creation and maintenance of web presentations. It covers the creation of data structures (HTML), graphical design (CSS), and dynamics on the client side (Javascript). The course continues with server-side dynamics programmed in PHP 7 language. The students will learn how to handle forms and how to create a simple web application. The subject ends with an oral and written exam.			

Code of the group: 2021_BSITECTSZAJ
Name of the group: Exam in English
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 Havlíčková, 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 Havlíčková, 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=2021_BSITECTSZAJ Name=Exam in English

B0B04B1K	English language B1 - classified assessment	KZ	0
verifying of the student´s skills of B1 level			
B0B04B2Z	English language B2 - exam	Z,ZK	0
I) The B2 English Exam is a compulsory subject for all Faculty of Electrical Engineering students at the Czech Technical University. According to the Study and Examination Rules and Regulations for Students at CTU (Part III, Article 4), a compulsory subject is one whose completion is a necessary condition in order to successfully complete the study programme. In addition, this requires the passing of an examination evaluated on the scale A, B, C, D, or E (SERR Part III, Article 6). II) According to the Common European Framework of Reference for Languages (CEFR), an international standard for describing language ability, the definition of an English language learner who has achieved the B2 (Upper-Intermediate) level is one who can understand the main ideas of complex text on both concrete and abstract topics, including technical discussions in his/her field of specialisation. Can interact with a degree of fluency and spontaneity that makes regular interaction with native speakers quite possible without strain for either party. Can produce clear, detailed text on a wide range of subjects and explain a viewpoint on a topical issue giving the advantages and disadvantages of various options. III) Students who have successfully passed an approved international exam within the past five years may present their certificate to the Department of Languages, Faculty of Electrical Engineering.Upon approval, students are then exempt from both the Written Test and the Oral Part. For a list of approved international exams go the department website: http://jazyky.fel.cvut.cz/			

Name of the block: Compulsory courses in the specialization
Minimal number of credits of the block: 20
The role of the block: PS

Code of the group: 2021_BSITPS4
Name of the group: Compulsory subjects - specialization
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 4 courses
Credits in the group: 20
Note on the group: Specialization

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
B2M32DSVA	**Distributed Computing** *Peter Macejko **Peter Macejko** Peter Macejko (Gar.)*	Z,ZK	6	2P + 2C	Z	PS
B0B32KTI	**Communication Technology for IoT** *Lukáš Vojtěch, Jiří Vodrážka **Lukáš Vojtěch** Lukáš Vojtěch (Gar.)*	Z,ZK	5	2P + 2L + 2D	Z	PS
B0B37NSI	**Design of IoT systems** *Stanislav Vítek **Stanislav Vítek** Stanislav Vítek (Gar.)*	Z,ZK	5	2P + 2L + 2D	L	PS
B6B32UOP	**Unix Operating Systems** *Pavel Troller **Ján Kučerák** Pavel Troller (Gar.)*	KZ	4	2P + 2C + 2D	Z	PS

Characteristics of the courses of this group of Study Plan: Code=2021_BSITPS4 Name=Compulsory subjects - specialization

B2M32DSVA	Distributed Computing	Z,ZK	6
The course is focused on technologies that support distributed computing: on mechanisms ensuring reliable, efficient and secure connection of application processes, programming interfaces of communication channels and up-to-date middleware technologies. A significant part of lectures is dedicated to distributed algorithms that assure causality, exclusive access, deadlock detection/avoidance, fault-tolerance, mobile computing, and security.			
B0B32KTI	Communication Technology for IoT	Z,ZK	5
The essence of IoT technologies is the transfer of information, communication of things with each other and especially the possibility of developing new types of services. The course in a simplified form presents the basics of digital communication, especially wireless, with a focus on specific communication protocols in IoT, not only in industrial applications. IoT is understood as a complex system with the possibility of using existing components, development and presentation environments for data processing and visualization, including the concept of IoT as a service. Part of the exercise is acquaintance with specific technologies in the laboratory and project solutions individually and in a team.			
B0B37NSI	Design of IoT systems	Z,ZK	5
B6B32UOP	Unix Operating Systems	KZ	4

Name of the block: Compulsory elective courses
Minimal number of credits of the block: 9
The role of the block: PV

Code of the group: 2021_BSITPVS4
Name of the group: Compulsory elective subjects - specialization
Requirement credits in the group: In this group you have to gain at least 9 credits (at most 37)
Requirement courses in the group: In this group you have to complete at least 2 courses (at most 7)
Credits in the group: 9
Note on the group: Specialization

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
B3B38LPE	**Laboratories of Industrial Electronics and Sensors** *Jan Fischer, Tomáš Drábek, Michal Janošek, Vojtěch Petrucha* ***Vojtěch Petrucha*** *Vojtěch Petrucha (Gar.)*	KZ	4	0P+4L	L	PV
B0B35LSP	**Logic systems and processors** *Richard Šusta, Martin Hlinovský* ***Martin Hlinovský*** *Zdeněk Hurák (Gar.)*	Z,ZK	6	2P+2L	L	PV
B6B34MK2	**Microcontrollers** *Vladimír Janíček, Tomáš Teplý* ***Tomáš Teplý*** *Vladimír Janíček (Gar.)*	Z,ZK	5	2P+2C	Z	PV
B4B38NVS	**Embedded Systems Design** *Jan Fischer, Vojtěch Petrucha* ***Jan Fischer*** *Jan Fischer (Gar.)*	Z,ZK	6	2P+2L	Z	PV
B6B32ST2	**Advanced Networking Technologies** *Leoš Boháč* ***Leoš Boháč*** *Leoš Boháč (Gar.)*	Z,ZK	5	2P + 2C + 4D	Z	PV
B6B39PDA	**Principles of mobile applications** ***Ivo Malý***	Z,ZK	6	2P+2C	L	PV
B6B39ZAN	**Basic Android development** *Ivo Malý* ***Ivo Malý*** *Ivo Malý (Gar.)*	KZ	5	2P+2C+4D	L	PV

Characteristics of the courses of this group of Study Plan: Code=2021_BSITPVS4 Name=Compulsory elective subjects - specialization

B3B38LPE	Laboratories of Industrial Electronics and Sensors	KZ	4
The objective of the "Laboratories" is to introduce students in a playful and interactive way with basic blocks of an industrial sensor system - from the sensor itself, through signal processing circuits, analog to digital signal conversion, software processing by a microcontroller up to the sending of the results to the superior system or database and their presentation to the user within the concept "Internet of Things".			
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]			
B6B34MK2	Microcontrollers	Z,ZK	5
B4B38NVS	Embedded Systems Design	Z,ZK	6
The course deals with design of embedded systems using ARM based microcontrollers.			
B6B32ST2	Advanced Networking Technologies	Z,ZK	5
B6B39PDA	Principles of mobile applications	Z,ZK	6
Student who successfully passed the course get overview about properties and about limits of single mobile technologies. The course is focused on specific problems related to limitations and new capabilities of mobile devices. Attention is paid to maximal utilization of environment characteristics in which the mobile application is used. Course is not focused on introduction of basic programming techniques for mobile application development - it is expected that students already have this skills or will be gained by means of self-study.			
B6B39ZAN	Basic Android development	KZ	5

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

Code of the group: 2021_BSITVOL
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
B0B04B1K	English language B1 - classified assessment verifying of the student´s skills of B1 level	KZ	0
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/		
B0B32KTI	Communication Technology for IoT	Z,ZK	5
	The essence of IoT technologies is the transfer of information, communication of things with each other and especially the possibility of developing new types of services. The course in a simplified form presents the basics of digital communication, especially wireless, with a focus on specific communication protocols in IoT, not only in industrial applications. IoT is understood as a complex system with the possibility of using existing components, development and presentation environments for data processing and visualization, including the concept of IoT as a service. Part of the exercise is acquaintance with specific technologies in the laboratory and project solutions individually and in a team.		
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]		
B0B36DBS	Database Systems	Z,ZK	6
	The course is designed as a basic database course mainly aimed at the student ability to design a relational data model and to use the SQL language for data definition as well as for data querying and to choose the appropriate degree of transaction isolation. Students will also get acquainted with the most commonly used indexing techniques, database system architecture and their management. They will verify their knowledge during the elaboration of a continuously submitted seminar task.		
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.		
B0B36ZAL	Introduction to Programming	Z,ZK	6
B0B37NSI	Design of IoT systems	Z,ZK	5
B0M32KSB	Cryptography and Network Security	Z,ZK	6
	The Information Security course provides a complete source of information on the field of security of information systems and information technologies. The most of information in today society is created, transferred, stored in electronic form so information security is very important part of it. Technical background for information security is provided by cryptology.		
B2M32DSVA	Distributed Computing	Z,ZK	6
	The course is focused on technologies that support distributed computing: on mechanisms ensuring reliable, efficient and secure connection of application processes, programming interfaces of communication channels and up-to-date middleware technologies. A significant part of lectures is dedicated to distributed algorithms that assure causality, exclusive access, deadlock detection/avoidance, fault-tolerance, mobile computing, and security.		
B3B38LPE	Laboratories of Industrial Electronics and Sensors	KZ	4
	The objective of the "Laboratories" is to introduce students in a playful and interactive way with basic blocks of an industrial sensor system - from the sensor itself, through signal processing circuits, analog to digital signal conversion, software processing by a microcontroller up to the sending of the results to the superior system or database and their presentation to the user within the concept "Internet of Things".		
B4B38NVS	Embedded Systems Design	Z,ZK	6
	The course deals with design of embedded systems using ARM based microcontrollers.		
B6B01LAG	Linear Algebra	Z,ZK	7
B6B01MAA	Mathematics Analysis	Z,ZK	5
	This course is an introduction to differential and integral calculus. It covers basic properties of functions, limits of functions, derivative and its applications (graphing, Taylor polynomial) and definite/indefinite integral with its applications, sequences and series.		
B6B01PRA	Statistics and Probability	Z,ZK	5
	The students will be introduced to the theory of probability and mathematical statistics, namely to the basic computing methods and their applications in practice. The course covers the basic parts of probability and mathematical statistics. The first part is focused on classical probability, including conditional probability. The next part deals with the theory of random variables and their distributions, examples of the most important types of discrete and continuous distributions, numerical characteristics of random variables, their independence, sums and transformations. Probabilistic knowledge is then used in the description of statistical methods for estimating distribution parameters and testing hypotheses.		
B6B01ZDM	Introduction to Discrete Mathematics	Z,ZK	5
	No advanced knowleges of mathematics are required at the beginning of this course. Using illustrative examples we build sufficient understanding of combinatorics, set and graph theory. Then we proceed to a brief formal construction of predicate calculus.		
B6B16INS	Information Systems	KZ	4
	The goal of this course is to familiarise students with the information systems topic and information systems implementation principles. During the course, students are introduced to "on the market" existing types of systems and their usage in specific industry segments. Students are familiarised with the CRM, ERP, MRP and other types of information systems. The fundamental part of the course is the introduction to key ideas of an information system selection, evaluation of information system benefits, ways of information systems		

	implementation and information system implementation based on the project management principles. The emphasis is on the initial customer analysis, customer insight and ability to decide whether it is better to implement any existing information system or to develop a new one from scratch. These factors determine the information system implementation success. At the end of the course information systems security, operation, support, maintenance, legislation impacts, and government information systems topics are discussed.		
B6B32PSI	Computer Networks	Z,ZK	5
B6B32ST2	Advanced Networking Technologies	Z,ZK	5
B6B32UOP	Unix Operating Systems	KZ	4
B6B34MK2	Microcontrollers	Z,ZK	5
B6B36DSA	Data Structures and Algorithms	Z,ZK	6
B6B36NSS	Design of Software Systems	Z,ZK	5
B6B36OMO	Object-oriented design and Modeling	Z,ZK	6
B6B36PCC	Programming in C/C++	Z,ZK	5
B6B36PM2	Management of Software Projects	KZ	4
B6B36SMP	Analysis and Modeling of Software Requirements	Z,ZK	6
	This course covers the topic of requirements engineering. Their gathering, analysis, documentation, management, ... Students also will gain knowledge on using the most widely spread graphic notation - UML.		
B6B36TS1	Software Testing	Z,ZK	5
B6B36ZSO	Introduction to Project Management	KZ	5
	Students are introduced to the basics of project management, which can be used not only in the field of IT projects. Students will also gain practical experience and knowledge in the area of teamwork (e.g. planning, team organization) and basics of legal and economic aspects of the project. The course also includes an introduction to presentation skills.		
B6B38ZPS	Basics of Computer Systems	Z,ZK	6
	The first topic introduces students to the basic concepts of computer technology and computer networks. The following lectures are focused on digital technology, internal structure and function of the processor and its instruction set. Common and special architectures and specialized instruction sets, ways to increase processor performance and their limits will be introduced. The computer architecture description, memories and their categorization in terms of functional principles and application use will be based on this knowledge. The following lectures are focused on getting acquainted with operating systems, multitasking, inter-process communication and synchronization, resource management and virtualization. The next lecture will deal with the computer networks - first in general (OSI model) and then more specifically with an introduction to TCP / IP protocols. Further the disk (mass storage) subsystem will be described in more detail, including disk partitioning, file systems, and access rights. Finally the basics of electronics and optoelectronics, typical problems motivating students to further deepen their knowledge in this area through self-study will be introduced.		
B6B39PDA	Principles of mobile applications	Z,ZK	6
	Student who successfully passed the course get overview about properties and about limits of single mobile technologies. The course is focused on specific problems related to limitations and new capabilities of mobile devices. Attention is paid to maximal utilization of environment characteristics in which the mobile application is used. Course is not focused on introduction of basic programming techniques for mobile application development - it is expected that students already have this skills or will be gained by means of self-study.		
B6B39ZAN	Basic Android development	KZ	5
B6B39ZMT	Foundations of Multimedia Production	KZ	3
	The course familiarizes students with the basic principles of acquisition and processing of multimedia content, with a focus on image processing, video and audio, as well as the principles of graphic design and its implementation in a web environment. The course is organized within the block teaching when, within four days, students gradually pass each section of the course divided into two lectures and two workshops each day. Students will acquire the practical principles in the acquisition and processing of multimedia content while they use several different types of instruments at the application level and at the level of simple code. All students will apply the knowledge gained within the last day dedicated to composition rules within a Web project. After completing the course, students will carry out their own independent project and after its submission will be assessed.		
B6B39ZWA	Foundations of Web Applications	Z,ZK	5
	The subject is focussing on the creation and maintenance of web presentations. It covers the creation of data structures (HTML), graphical design (CSS), and dynamics on the client side (Javascript). The course continues with server-side dynamics programmed in PHP 7 language. The students will learn how to handle forms and how to create a simple web application. The subject ends with an oral and written exam.		
B6BPROJ6	Semestral Project	Z	6
	Individual or team work in form of a project. Student selects the subject of their project from the list of topics relevant to the studied specialization and provided by the specific department/departments. The project's subject can be closely related to the future Bachelor thesis. Further instructions for the selection and resolution of the projects can be found on the web pages of the selected department. Within this course the project is also defended.		
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.		

For updated information see http://bilakniha.cvut.cz/en/f3.html
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