

# 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  
 Garant of the study branch: doc. Ing. Miroslav Bureš, Ph.D.  
 Program of study: Software Engineering and Technology  
 Type of study: Bachelor full-time  
 Required credits: 167  
 Elective courses credits: 13  
 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<br>(in case of groups of courses the list of codes of their members)<br>Tutors, authors and guarantors (gar.) | Completion | Credits | Scope | Semester | Role |
|--------|---|------------|---------|-------|----------|------|
| BBAP20 | <b>Bachelor thesis</b><br>Roman Mejla (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<br>(in case of groups of courses the list of codes of their members)<br>Tutors, authors and guarantors (gar.) | Completion | Credits | Scope   | Semester | Role |
|------|---|------------|---------|---------|----------|------|
| BEZB | <b>Safety in Electrical Engineering for a bachelor's degree</b><br>Vladimír K la, Ivana Nová, Radek Havlí ek Radek Havlí ek Vladimír K la (Gar.)                | Z          | 0       | 2BP+2BC | Z,L      | P    |
| BEZZ | <b>Basic health and occupational safety regulations</b><br>Vladimír K la, Ivana Nová, Radek Havlí ek Radek Havlí ek Vladimír K la (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<br>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.  | Z | 0 |
| BEZZ | Basic health and occupational safety regulations<br>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. | Z | 0 |

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<br>(in case of groups of courses the list of codes of their members)<br>Tutors, authors and guarantors (gar.) | Completion | Credits | Scope        | Semester | Role |
|----------|---|------------|---------|--------------|----------|------|
| B0B36DBS | <b>Database Systems</b><br>Martin Svoboda Martin Svoboda (Gar.)   | Z,ZK       | 6       | 2P+2C+4D     | L        | P    |
| B6B36DSA | <b>Data Structures and Algorithms</b><br>Karel Richta Karel Richta (Gar.)   | Z,ZK       | 6       | 2P+3C+3D     | L        | P    |
| B6B16INS | <b>Information Systems</b><br>Pavel Náplava, Jan Koří Pavel Náplava (Gar.)  | KZ         | 4       | 2P+2S+3D     | L        | P    |
| B0M32KSB | <b>Cryptography and Network Security</b><br>Tomáš Vaněk Tomáš Vaněk Tomáš Vaněk (Gar.)  | Z,ZK       | 6       | 2P+2L+4D     | Z        | P    |
| B6B01LAG | <b>Linear Algebra</b><br>Jiří Velebil, Alena Gollová Jiří Velebil Jiří Velebil (Gar.)   | Z,ZK       | 7       | 4P+2C+2D     | L        | P    |
| B6B01MAA | <b>Mathematics Analyze</b><br>Natalie Žukovec Natalie Žukovec Natalie Žukovec (Gar.)  | Z,ZK       | 5       | 2P+2S+2D     | Z        | P    |
| B6B36NSS | <b>Design of Software Systems</b><br>Jiří Šebek Jiří Vokíněk  | Z,ZK       | 5       | 2P+2C+2D     | L        | P    |
| B6B36OMO | <b>Object-oriented design and Modeling</b><br>David Kadlec, David Kukačka, David Kadlec David Kadlec David Kadlec (Gar.)  | Z,ZK       | 6       | 2P+2C+4D     | Z        | P    |
| B6B32PSI | <b>Computer Networks</b><br>Tomáš Vaněk, Leoš Boháč Jan Koří Leoš Boháč (Gar.)  | Z,ZK       | 5       | 2P + 2C + 3D | Z        | P    |
| B6B36PCC | <b>Programming in C/C++</b><br>Karel Richta Karel Richta Karel Richta (Gar.)  | Z,ZK       | 5       | 2P+2C+4D     | Z        | P    |
| B0B36PJV | <b>Programming in Java</b><br>Jiří Vokíněk Jiří Vokíněk Jiří Vokíněk (Gar.)   | Z,ZK       | 6       | 2P+3C+7D     | L        | P    |
| B6B36PM2 | <b>Management of Software Projects</b><br>Miroslav Bureš  | KZ         | 4       | 2P+2C+2D     | Z        | P    |
| B6B36SMP | <b>Analysis and Modeling of Software Requirements</b><br>Martin Komárek Martin Komárek Martin Komárek (Gar.)  | Z,ZK       | 6       | 2P+3C+3D     | L        | P    |
| B6BPROJ6 | <b>Semestral Project</b><br>Jiří Šebek Jiří Šebek Jiří Šebek (Gar.)   | Z          | 6       | 2s           | L,Z      | P    |
| B6B01PRA | <b>Statistics and Probability</b><br>Kateřina Helisová Kateřina Helisová (Gar.)   | Z,ZK       | 5       | 2P+2S+1D     | L        | P    |
| B6B36TS1 | <b>Software Testing</b><br>Miroslav Bureš Miroslav Bureš Miroslav Bureš (Gar.)  | Z,ZK       | 5       | 2P+2C+2D     | L        | P    |
| B0B36ZAL | <b>Introduction to Programming</b><br>Jiří Vokíněk  | Z,ZK       | 6       | 2P+2C+8D     | Z        | P    |
| B6B01ZDM | <b>Introduction to Discrete Mathematics</b><br>Jaroslav Tišer, Matěj Novotný Jaroslav Tišer (Gar.)  | Z,ZK       | 5       | 2P+2S+2D     | Z        | P    |
| B6B39ZMT | <b>Foundations of Multimedia Production</b><br>Lucie Svobodová, Roman Berka, František Rund Roman Berka Roman Berka (Gar.)                                      | KZ         | 3       | 4P+4L+2D     | Z        | P    |
| B6B38ZPS | <b>Basics of Computer Systems</b><br>Jiří Novák Jiří Vokíněk Jiří Novák (Gar.)  | Z,ZK       | 6       | 4P+2L+2D     | Z        | P    |
| B6B36ZSO | <b>Introduction to Project Management</b><br>Pavel Náplava  | KZ         | 5       | 2P+2C+5D     | Z        | P    |
| B6B39ZWA | Martin Klíma, Martin Mudra, Petr Huňák Miroslav Bureš 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 |
| 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 Analyze                            | 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 |
| 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 formal construction of propositional 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 |
| B6B39ZWA   |  | 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<br>(in case of groups of courses the list of codes of their members)<br><i>Tutors, authors and guarantors (gar.)</i>  | Completion | Credits | Scope | Semester | Role |
|----------|---|------------|---------|-------|----------|------|
| B0B04B1K | <b>English language B1 - classified assessment</b><br><i>Petra Jennings, Dana Saláková, Markéta Havlíková, Michael Ynsua, Jonathan Michael Daly, Erik Peter Stadnik, Pavla Péterová, Hana Procházková Pavla Péterová Dana Saláková (Gar.)</i> | KZ         | 0       | 0C    | Z,L      | P    |
| B0B04B2Z | <b>English language B2 - exam</b><br><i>Petra Jennings, Dana Saláková, Markéta Havlíková, Michael Ynsua, Jonathan Michael Daly, Erik Peter Stadnik, Pavla Péterová Pavla Péterová Dana Saláková (Gar.)</i>                                    | 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<br>verifying of the student's skills of B1 level | KZ | 0 |
|----------|--|----|---|

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

B2 Common European Framework: 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. Grammar and Vocabulary: word families, verb-noun collocations, complex noun phrases, countable and uncountable nouns, prefixes, it-clauses, reporting verbs, questions, modal verbs, conjunctions and sentence connectors, articles, prepositions, wh-noun clauses, relative clauses, if-clauses, passive voice, past perfect, -ing nouns Listening: picking up information, transferring information Reading: A technical text is presented. Students are required to show understanding the concept and vocabularies. Writing: Emphasis is put on the expression of ideas in the independent writing of paragraphs and short essays. Students should be able to present a short basic argument in written English. Oral Skills: Students are supposed to use the language independently and effectively in all situations giving their own opinions and defending their ideas and beliefs. A mixture of research and development, career oriented and general topics is presented. Examination: The examination consists of two parts: a) Written test ? based on grammar and lexicology, NOT TAKEN by the students whose success rate in both the summer semester tests (Midterm and Final) is above 80%. The written test is followed by the oral part. b) Oral part ? reading a technical text with understanding (study reading techniques ? skimming and scanning, comprehension and discussion questions based on the text, translation), oral interaction, comprehending the content of the spoken message.

Name of the block: Povinné p edm ty specializace

Minimal number of credits of the block: 21

The role of the block: PS

Code of the group: 2021\_BSITPS1

Name of the group: Compulsory subjects - specialization Enterprise Systems

Requirement credits in the group: In this group you have to gain 21 credits

Requirement courses in the group: In this group you have to complete 4 courses

Credits in the group: 21

Note on the group: Specialization Enterprise Systems

| Code      | Name of the course / Name of the group of courses<br>(in case of groups of courses the list of codes of their members)<br>Tutors, authors and guarantors (gar.) | Completion | Credits | Scope    | Semester | Role |
|-----------|---|------------|---------|----------|----------|------|
| B2M32DSVA | <b>Distributed Computing</b><br>Peter Macejko Peter Macejko (Gar.)  | Z,ZK       | 6       | 2P + 2C  | Z        | PS   |
| B6B36EAR  | <b>Enterprise Architectures</b><br>Petr K emen, Petr Aubrecht, Lama Saeeda Petr K emen Petr K emen (Gar.)   | KZ         | 5       | 2P+2C+2D | Z        | PS   |
| B6B16ISP  | <b>Business Process Management</b><br>Pavel Náplava Pavel Náplava Pavel Náplava (Gar.)  | Z,ZK       | 5       | 2P+2S+2D | Z        | PS   |
| B0B39KAJ  | <b>Client applications in JavaScript</b><br>Ond ej Žára Ond ej Žára Ond ej Žára (Gar.)  | Z,ZK       | 5       | 2P+2C    | L        | PS   |

Characteristics of the courses of this group of Study Plan: Code=2021\_BSITPS1 Name=Compulsory subjects - specialization Enterprise Systems

|           |                       |      |   |
|-----------|-----------------------|------|---|
| 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.

|          |                          |    |   |
|----------|--------------------------|----|---|
| B6B36EAR | Enterprise Architectures | KZ | 5 |
|----------|--------------------------|----|---|

The course offers an overview of enterprise system architectures, focusing on Spring and Java EE. Students will become familiar with the most common enterprise architectures and related design patterns. In particular, the focus will be put on the principles of inversion control, dependency injection and Java Bean lifecycle. Pairs of students will prepare a simple enterprise application as their semestral work.

|          |                             |      |   |
|----------|-----------------------------|------|---|
| B6B16ISP | Business Process Management | Z,ZK | 5 |
|----------|-----------------------------|------|---|

|          |                                   |      |   |
|----------|-----------------------------------|------|---|
| B0B39KAJ | Client applications in JavaScript | Z,ZK | 5 |
|----------|-----------------------------------|------|---|

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\_BSITPVS1

Name of the group: Compulsory elective subjects - specialization Enterprise Systems

Requirement credits in the group: In this group you have to gain at least 9 credits (at most 21)

Requirement courses in the group: In this group you have to complete at least 2 courses ( at most 4)

Credits in the group: 9

Note on the group: Specialization Enterprise Systems

| Code     | Name of the course / Name of the group of courses<br>(in case of groups of courses the list of codes of their members)<br>Tutors, authors and guarantors (gar.) | Completion | Credits | Scope           | Semester | Role |
|----------|---|------------|---------|-----------------|----------|------|
| B2M32PST | <b>Advanced Networking Technologies</b><br>Leoš Bohá Zbyn k Kocur Leoš Bohá (Gar.)  | Z,ZK       | 6       | 2P + 2C<br>+ 4D | Z        | PV   |

|          |  |      |   |                 |   |    |
|----------|--|------|---|-----------------|---|----|
| B6B39PDA | <b>Principles of mobile applications</b><br><i>Ivo Malý Ivo Malý Ivo Malý (Gar.)</i>   | Z,ZK | 6 | 2P+2C           | L | PV |
| B0B39SPS | <b>Computer Networks Administration</b><br><i>Jan Kubr Jan Kubr (Gar.)</i>             | KZ   | 5 | 2P+2C+3D        | L | PV |
| B6B32UOP | <b>Unix Operating Systems</b><br><i>Pavel Troller Ján Ku erák Pavel Troller (Gar.)</i> | KZ   | 4 | 2P + 2C<br>+ 2D | Z | PV |

**Characteristics of the courses of this group of Study Plan: Code=2021\_BSITPVS1 Name=Compulsory elective subjects - specialization Enterprise Systems**

|          |   |      |   |
|----------|---|------|---|
| B2M32PST | <b>Advanced Networking Technologies</b><br>Subject Advanced Network Technologies expands students' knowledge of modern network technologies. The course is practically oriented and focused on explaining the function of advanced network protocols as used in modern data networks of today and tomorrow. Students will gain practical experience with the issues like Internet routing, software-defined networks, multicast routing, IPv6, and MPLS networks. Part of the course is also devoted to a detailed explanation of transport protocols TCP/UDP and a manner in which software applications can access transportation services of TCP/IP data networks. | Z,ZK | 6 |
| B6B39PDA | <b>Principles of mobile applications</b><br>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.  | Z,ZK | 6 |
| B0B39SPS | <b>Computer Networks Administration</b>   | KZ   | 5 |
| B6B32UOP | <b>Unix Operating Systems</b>   | KZ   | 4 |

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<br>verifying of the student's skills of B1 level   | KZ         | 0       |
| B0B04B2Z | English language B2 - exam<br>B2 Common European Framework: 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. Grammar and Vocabulary: word families, verb-noun collocations, complex noun phrases, countable and uncountable nouns, prefixes, it-clauses, reporting verbs, questions, modal verbs, conjunctions and sentence connectors, articles, prepositions, wh-noun clauses, relative clauses, if-clauses, passive voice, past perfect, -ing nouns Listening: picking up information, transferring information Reading: A technical text is presented. Students are required to show understanding the concept and vocabularies. Writing: Emphasis is put on the expression of ideas in the independent writing of paragraphs and short essays. Students should be able to present a short basic argument in written English. Oral Skills: Students are supposed to use the language independently and effectively in all situations giving their own opinions and defending their ideas and beliefs. A mixture of research and development, career oriented and general topics is presented. Examination: The examination consists of two parts: a) Written test ? based on grammar and lexicology, NOT TAKEN by the students whose success rate in both the summer semester tests (Midterm and Final) is above 80%. The written test is followed by the oral part. b) Oral part ? reading a technical text with understanding (study reading techniques ? skimming and scanning, comprehension and discussion questions based on the text, translation), oral interaction, comprehending the content of the spoken message. | Z,ZK       | 0       |
| B0B36DBS | Database Systems   | Z,ZK       | 6       |
| B0B36PJV | Programming in Java  | Z,ZK       | 6       |
| B0B36ZAL | Introduction to Programming  | Z,ZK       | 6       |
| B0B39KAJ | Client applications in JavaScript  | Z,ZK       | 5       |
| B0B39SPS | Computer Networks Administration   | KZ         | 5       |
| B0M32KSB | Cryptography and Network Security<br>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.  | Z,ZK       | 6       |

|  |  |      |   |
|--|--|------|---|
| 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.  |  |      |   |
| B2M32PST   | Advanced Networking Technologies               | Z,ZK | 6 |
| Subject Advanced Network Technologies expands students' knowledge of modern network technologies. The course is practically oriented and focused on explaining the function of advanced network protocols as used in modern data networks of today and tomorrow. Students will gain practical experience with the issues like Internet routing, software-defined networks, multicast routing, IPv6, and MPLS networks. Part of the course is also devoted to a detailed explanation of transport protocols TCP/UDP and a manner in which software applications can access transportation services of TCP/IP data networks.   |  |      |   |
| B6B01LAG   | Linear Algebra                                 | Z,ZK | 7 |
| B6B01MAA   | Mathematics Analyze                            | 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 formal construction of propositional 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.   |  |      |   |
| B6B16ISP   | Business Process Management                    | Z,ZK | 5 |
| B6B32PSI   | Computer Networks                              | Z,ZK | 5 |
| B6B32UOP   | Unix Operating Systems                         | KZ   | 4 |
| B6B36DSA   | Data Structures and Algorithms                 | Z,ZK | 6 |
| B6B36EAR   | Enterprise Architectures                       | KZ   | 5 |
| The course offers an overview of enterprise system architectures, focusing on Spring and Java EE. Students will become familiar with the most common enterprise architectures and related design patterns. In particular, the focus will be put on the principles of inversion control, dependency injection and Java Bean lifecycle. Pairs of students will prepare a simple enterprise application as their semestral work.  |  |      |   |
| 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 |
| 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.   |  |      |   |
| 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   |  | 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.  |  |      |   |

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| 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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