# Recomended pass through the study plan

# Name of the pass: Open Electronic Systems - Passage through study

Faculty/Institute/Others:

Department:

Pass through the study plan: Open Electronic Systems

Branch of study guranteed by the department: Welcome page

Guarantor of the study branch: Program of study: Welcome page Type of study: unknown full-time

Note on the pass:

Coding of roles of courses and groups of courses:

P - compulsory courses of the program, PO - compulsory courses of the branch, Z - compulsory courses, S - compulsory elective courses, PV - compulsory elective courses, F - elective specialized courses, V - elective courses, T - physical training courses

Coding of ways of completion of courses (KZ/Z/ZK) and coding of semesters (Z/L):

KZ - graded assesment, Z - assesment, ZK - examination, L - summer semester, Z - winter semester

#### Number of semester: 1

| Code      | Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.) | Completion | Credits | Scope   | Semester | Role |
|-----------|---|------------|---------|---------|----------|------|
| AE8B14ADP | Algorithm Development and Programming   | Z,ZK       | 5       | 2+2c    | Z        | Р    |
| BEEZZ     | Basic health and occupational safety regulations Radek Havlí ek, Vladimír K la, Ivana Nová Radek Havlí ek Vladimír K la (Gar.)                            | Z          | 0       | 2BP+2BC | Z        | Р    |
| AE8B01DMG | Discrete Math. & Graphs   | Z,ZK       | 5       | 3+1s    | 1        | Р    |
| AE8B01LAG | Linear Algebra  | Z,ZK       | 7       | 4+2s    | 1        | Р    |
| AE8B01MC1 | Mathematics-Calculus1   | Z,ZK       | 7       | 4+2s    | 1        | Р    |
| BEEZB     | Safety in Electrical Engineering for a bachelor's degree<br>Radek Havlí ek, Vladimír K la, Ivana Nová Radek Havlí ek Vladimír K la<br>(Gar.)              | Z          | 0       | 2BP+2BC | Z,L      | Р    |
| AE8B01CAS | Comp.Alg.Syst.  | Z          | 2       | 0+2c    | 1        | РО   |
| AE8B32IES | Introduction to Electronic Systems  | Z          | 2       | 0P + 2L | Z        | PO   |

#### Number of semester: 2

| 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 |
|-----------|---|------------|---------|-------|----------|------|
| AE8B01DEN | Differential Equations&Numerical Methods  | Z,ZK       | 7       | 4+2s  | 1        | Р    |
| AE8B01MCM | Mathematics-Calculus m-D  | Z,ZK       | 7       | 4+2s  | 1        | Р    |
| AE8B02PH1 | Physics 1   | Z,ZK       | 7       | 4+2L  | L        | Р    |
| AE8B37DIT | Digital Design  | Z,ZK       | 5       | 2P+2C | L        | РО   |
| AE8B31ELE | Elements of Electronics   | KZ         | 4       | 2P    | L        | РО   |

#### Number of semester: 3

| 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 |
|-----------|---|------------|---------|-------|----------|------|
| AE8B01MCT | Mathematics-Complex Variable and Integral Transforms  | Z,ZK       | 7       | 4+2s  | 1        | Р    |
| AE8B02PH2 | Physics 2   | Z,ZK       | 7       | 4+2L  | Z        | Р    |
| AE8B01PSI | Probability, Statistics and Information Theory  | Z,ZK       | 6       | 4+2s  | 1        | Р    |
| AE8B17EMT | Electromagnetic Field Theory  | Z,ZK       | 8       | 4P+2S | Z        | PO   |

Number of semester: 4

| 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 |
|-----------|---|------------|---------|-------|----------|------|
| AE8B01AMA | Advanced Matrix Analysis  | Z,ZK       | 4       | 3+1s  | 1        | Р    |
| AE8B01OGT | Optimization and Game Theory  | Z,ZK       | 4       | 3+1s  | L        | Р    |
| AE8B31CIR | Circuit Theory  | Z,ZK       | 8       | 4P+2S | L        | РО   |
| AE8B37SAS | Signals and Systems   | Z,ZK       | 8       | 4P+2C | L        | PO   |
| AE8B34SST | Solid State Physics   | Z,ZK       | 4       | 3P+1L | L        | РО   |

### Number of semester: 5

| 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 |
|-----------|---|------------|---------|---------|----------|------|
| AE8B31AAC | Analog and Acitve Circuits  | Z,ZK       | 6       | 3P+2S   | Z        | PO   |
| AE8B32DNT | Data Networks Theory  | Z,ZK       | 5       | 3P + 1L | Z        | PO   |
| AE8B37DCM | Digital Communications  | Z,ZK       | 5       | 4P+0C   | Z        | PO   |
| AE8B32DSP | Digital Signal Processing   | Z,ZK       | 5       | 3P + 1L | Z        | РО   |
| AE8B32DCL | Digital Signal Processing and Communication Laboratory  | Z          | 2       | 0P + 2C | Z        | PO   |
| AE8B34EOD | Electronic and Optoelectronic Devices   | Z,ZK       | 6       | 3P+2L   | Z        | PO   |

#### Number of semester: 6

| 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 |
|-----------|---|------------|---------|-------|----------|------|
| ABAP9     | Bachelor thesis   | Z          | 9       | 28s   | L        | Р    |
| AE8B17ELD | Electrodynamics   | Z,ZK       | 5       | 3P+1S | L        | РО   |
| AE8B38EME | Electronic Measurements   | KZ         | 4       | 2P+1L | L        | РО   |
| AE8B35FCS | Feed-Back Control Systems   | Z,ZK       | 6       | 4P+2L | L        | PO   |
| AE8B37SSP | Statistical Signal Processing   | Z,ZK       | 6       | 4P+0C | L        | РО   |

# List of groups of courses of this pass with the complete content of members of individual groups

# List of courses of this pass:

| Code                 | Name of the course  | Completion             | Credits       |
|----------------------|---|------------------------|---------------|
| ABAP9                | Bachelor thesis   | Z                      | 9             |
| AE8B01AMA            | Advanced Matrix Analysis  | Z,ZK                   | 4             |
|                      | The course covers advanced topics of linear algebra, in particular matrix factorizations and construction of matrix functions               | 5.                     | •             |
| AE8B01CAS            | Comp.Alg.Syst.  | Z                      | 2             |
| Computer algeb       | ra systems (CAS) Maple, Matlab and Mathematica are used to demonstrate basic mathematical concepts that students encounter in               | subjects Mathema       | atics and     |
| Introductory Algebi  | a. Seminars provide both computational and graphical examples with particular emphasis on problems whose solution without CAS               | is either difficult or | impossible.   |
| AE8B01DEN            | Differential Equations&Numerical Methods  | Z,ZK                   | 7             |
| This course offers a | n introduction to differential equations and numerical methods. We survey major types of ordinary differential equations and introduce      | s partial differentia  | l equations.  |
|                      | For common problems (roots, systems of linear equations, ODE?s) we will show basic approaches for solving them numerical                    | ally.                  |               |
| AE8B01DMG            | Discrete Math. & Graphs   | Z,ZK                   | 5             |
| The course introd    | uces basic notions from discrete mathematics directed to those topics useful for electrical engineering studies. The content of the co      | urse covers: infinite  | e sets with   |
| emphasis to cardia   | anlity of sets, binary relations with emphasis to equivalence relations and partial ordes'; integers, relation modulo n'; basic algebraic s | structures (includin   | finite fields |
| l                    | of characteristic 2). Furher the course contains basic notions and their applications from graph theory.                                    |                        |               |

| AE8B01LAG  |  |  |  |
|--|--|--|--|
|  | Linear Algebra   | Z,ZK   | 7  |
|  | ntroductory topics of linear algebra. The main focus is on the related notions of linear spaces and linear transformations (linear independent of the control of the contro |  |  |
| and matrices (def  | erminants, inverse matrix, matrix of a linear mapping, eigenvalues). Applications include solving systems of linear equations, geometric product and group product and group product.  | try in n-space (incl   | uding dot  |
| AEODO1MC1  | product and cross product).  Methometics Coloulus1   | Z,ZK   | 7  |
| AE8B01MC1  | Mathematics-Calculus1  The aim of the course is to introduce students to basics of differential and integral calculus of functions of one variable.  | Z,ZN   | 1  |
| AE8B01MCM  | Mathematics-Calculus m-D   | Z,ZK   | 7  |
|  | s an introduction to the differential and integral calculus in several variables and basic relations between curve and surface integrals.  |  |  |
|  | series and power series with application to Taylor and Fourier series.   |  |  |
| AE8B01MCT  | Mathematics-Complex Variable and Integral Transforms   | Z,ZK   | 7  |
| AE8B01OGT  | Optimization and Game Theory   | Z,ZK   | 4  |
| AE8B01PSI  | Probability, Statistics and Information Theory   | Z,ZK   | 6  |
| l l  | ty theory, mathematical statistics, information theory, and coding. Includes descriptions of probability, random variables and their dist  |  |  |
| •  | ndom variables. Basics of mathematical statistics: Point and interval estimates, methods of parameters estimation and hypotheses te  |  |  |
|  | Basic notions and results of the theory of Markov chains. Shannon entropy, mutual and conditional information.   |  |  |
| AE8B02PH1  | Physics 1  | Z,ZK   | 7  |
|  | physics at the Faculty of Electrical Engineering - Physics 1, is devoted to the introduction into two important areas of physics. The first  |  |  |
|  | is the electric and magnetic field. Within the framework of the classical mechanics, the students study the particle kinematics; dynamic   | •  | -  |
| •  | nd rigid bodies. The students should be able to solve basic problems dealing with the description of mechanical systems, which they<br>al mechanics is followed by the relativistic mechanics, electric and magnetic field - both stationary as well as non-stationary. The stuc   | U  |  |
|  | study of electrical circuits, theory of electrotechnical materials or radioelectronics. Apart of this, the knowledge gained in this course   |  | -  |
|  | consecutive course Physics 2.  |  | ,  |
| AE8B02PH2  | Physics 2  | Z,ZK   | 7  |
|  | 2 is closely linked with the course Physics 1. Within the framework of this course the students will first of all learn foundations of phe   | nomenological an   | d statistical  |
| thermodynamics. Fo   | ollowing topic - the theory of waves - will give to the students basic insight into the properties of waves and will help to the students to   | understand that the  | e presented  |
| •  | aves has a universal character in spite of the waves character. Particular types of waves, such as acoustic or electromagnetic waves a   | •  | - 1  |
|  | echanics physics will complete the student's general education in physics. The knowledge gained in this course will help to the student  | •  | rn technical   |
|  | s encountered during their studies and will allow them to understand the principles of novel technologies and functioning of new elec  |  | 5  |
| AE8B14ADP  | Algorithm Development and Programming  htroduction to algorithm design of basic and more advanced computer tasks, Digital computer structure, Introduction to the C program  | Z,ZK   | _  |
| =  | skills of procedural programming paradigm, variable, data type, declaration, operators, expressions, statements, functions, paramete   |  | -  |
|  | lation and debugging methods, preprocessor, conditional compilation, standard libraries, specific of embedded computer systems pr  |  | -  |
| AE8B17ELD  | Electrodynamics  | Z,ZK   | 5  |
| The course AEB17   | ELD (electrodynamics) is a follow up of the course AEB17EMTA (Electromagnetic field theory). The course starts with a decomposition  | on of electromagne   | tic field into   |
|  | ces radiation of waves and guides student through the interaction of electromagnetic waves with material boundaries. The theory of   | _  | ansmission   |
|  | s is also shown. The course ends with wave scattering. The knowledge gained in this course is needed for number of specialized ma  |  | _  |
| AE8B17EMT  | Electromagnetic Field Theory   | Z,ZK   | 8  |
|  | ainted with physics fundaments of the electromagnetic theory and with its mathematical description. Particularly, the course guides st<br>roduces coupling between time varying fields and it is ends with an introduction to an electromagnetic wave. The knowledge gained  | -  |  |
| -  | requent course AE8B17ELD (Electrodynamics), for the course of circuit theory, theory of semiconductors and a number of specialize  |  | ieeueu ioi   |
| AE8B31AAC  | Analog and Acitve Circuits   | Z,ZK   | 6  |
| l l  | 1 AAC is oriented on presentation, matematical description, analysis and sythesis of basic analogue active circuits and function block   | , ,  | _  |
| •  | on basic semiconductor electronic components operating in linear and non-linear modes.   | ,  |  |
| AE8B31CIR  | Circuit Theory   | Z,ZK   | 8  |
| The subject AE8B3  | ICIR is a complet systematic presentation of electrical circuit theory. It is based on general physical nature of electromagnetic effects,   |  |  |
| •  |  | an electric circuit is   | s presented  |
| as a special quasist   | ationary case of electromagnetic field. It defines basic circuit quantities (voltage, current) and basic circuit elements modeling all kinds   | s of actual energy in  | nteractions.   |
| as a special quasist<br>The subject is spec  | ifically oriented on linear electrical circuit (analogue LTI systems), it presents basic priciples and theorems of circuit theory, and analysis  | s of actual energy in<br>ysis methods of line  | nteractions.<br>ear circuits   |
| as a special quasist<br>The subject is spec  | ifically oriented on linear electrical circuit (analogue LTI systems), it presents basic priciples and theorems of circuit theory, and analy-<br>and transient states (modes), respectively. The time domain and frequency domain analysis is strictly differentiated. "System? characteristics is strictly differentiated."   | s of actual energy in<br>ysis methods of lin-<br>terization is applied   | nteractions.<br>ear circuits   |
| as a special quasist<br>The subject is spec<br>working in steady a   | ifically oriented on linear electrical circuit (analogue LTI systems), it presents basic priciples and theorems of circuit theory, and analysident transient states (modes), respectively. The time domain and frequency domain analysis is strictly differentiated. "System? characteristics transfer properties analysis, stability analysis, and feedback theory. At the end the subject deals with basis of discrete LTI systems   | s of actual energy in<br>ysis methods of lin<br>terization is applied<br>theory.   | nteractions.<br>ear circuits<br>d on circuit   |
| as a special quasist<br>The subject is spec<br>working in steady a   | ifically oriented on linear electrical circuit (analogue LTI systems), it presents basic priciples and theorems of circuit theory, and analysing transfer properties analysis, stability analysis, and feedback theory. At the end the subject deals with basis of discrete LTI systems  Elements of Electronics   | s of actual energy in<br>ysis methods of lin<br>terization is applied<br>theory.   | nteractions.<br>ear circuits<br>d on circuit   |
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| as a special quasist The subject is spec working in steady a  AE8B31ELE The subject AE8B3 engineering, describ   | ifically oriented on linear electrical circuit (analogue LTI systems), it presents basic priciples and theorems of circuit theory, and analysind transient states (modes), respectively. The time domain and frequency domain analysis is strictly differentiated. "System? characterization transfer properties analysis, stability analysis, and feedback theory. At the end the subject deals with basis of discrete LTI systems  Elements of Electronics  1ELE (B-ELE) is a free continuation of the subject AE8B32IES (B-IES), now with technical contents yet, that provides elementary ba   | s of actual energy in some sof actual energy in systems applied the street of the stre | nteractions. ear circuits d on circuit  4 d electronic AE8B31DIT   |
| as a special quasist The subject is spec working in steady a  AE8B31ELE The subject AE8B3 engineering, descrit (B-DIT), AE8B31EI   | ifically oriented on linear electrical circuit (analogue LTI systems), it presents basic priciples and theorems of circuit theory, and analysind transient states (modes), respectively. The time domain and frequency domain analysis is strictly differentiated. "System? characteristic transfer properties analysis, stability analysis, and feedback theory. At the end the subject deals with basis of discrete LTI systems  Elements of Electronics  1ELE (B-ELE) is a free continuation of the subject AE8B32IES (B-IES), now with technical contents yet, that provides elementary bases and explains common contexts among electrical phenomena, that are important for subsequent specialized subjects (for instance AE   | s of actual energy in some sof actual energy in serious serious serious serious KZ KZ ksis of electrical and 8B31CIR (B-CIR), adequate to the 2nd  | d electronic AE8B31DIT d semester  |
| as a special quasist The subject is spec working in steady a  AE8B31ELE The subject AE8B3 engineering, describ (B-DIT), AE8B31EI of the bachelor stu   | ifically oriented on linear electrical circuit (analogue LTI systems), it presents basic priciples and theorems of circuit theory, and analysis and transient states (modes), respectively. The time domain and frequency domain analysis is strictly differentiated. "System? character transfer properties analysis, stability analysis, and feedback theory. At the end the subject deals with basis of discrete LTI systems  Elements of Electronics  1ELE (B-ELE) is a free continuation of the subject AE8B32IES (B-IES), now with technical contents yet, that provides elementary base and explains common contexts among electrical phenomena, that are important for subsequent specialized subjects (for instance AEAT (B-EMT), AE8B31SAS (B-SAS).). The subject education uses relatively simple, elementary mathematical and physical methods and stage. The subject provides basis of: - electromagnetic field and electrical circuit theory - semiconductor components theory - sign and microprocessor technique.  | s of actual energy in system thous of liniterization is applied theory.  KZ usis of electrical and 8B31CIR (B-CIR), and adequate to the 2nd and system theorem.  | nteractions. ear circuits d on circuit  4 d electronic AE8B31DIT d semester ory - digital  |
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students are introduced to basic principles of device simulation, measurement of device characteristics and extraction of device parameters. Operation of electron devices in electronic systems is then analyzed using the PSpice simulator. Z,ZKAF8B34SST Solid State Physics 4 The subject is aimed on solid state physics including some parts of statistical physics. The subject informs about basic properties of materials used in electronics, esp. about semiconductors. AE8B35FCS Feed-Back Control Systems Z.ZK Foundation course of automatic control. Introduction to basic concepts and properties of dynamic systems of physical, engineering, biological, economics, robotics and informatics nature. Basic principles of feedback and its use as a tool for altering the behavior of systems and managing uncertainty. Classical and modern methods for analysis and design of automatic control systems. Students specialized in systems and control will build on these ideas and knowledge in the advanced courses to follow. Students of other branches and programs will find out that control is a inspiring, ubiquitous and entertaining field worth of a future cooperation. AE8B37DCM **Digital Communications** The course provides fundamentals of digital communications theory: modulation, classical coding, channel models, and basic principles of decoding. The exposition is systematically built along the theoretical lines which allow to reveal all inner connections and principles. This allows students to develop the knowledge and use it in an active way in a design and construction of the communication systems. The course provides a necessary fundamental background for subsequent more advanced communications theory courses. AF8B37DIT Digital Design The goal of this course is to introduce the philosophy of digital circuits' design, to provide formal description of combinational and sequential logical circuits, their functional blocks. Both mathematical and functional description, as well as minimization algorithms for output and transient functions of digital components and circuits is presented. Karnaugh maps, latch elements, finite-state Mealy and Moore machines are the essential part of the content. The subject matter discussed will be tested on the typical design of digital circuits. AE8B37SAS Signals and Systems Z,ZK Continuous and discrete time signal representation in time and frequency domain. Stochastic signals and their parameters. Elementary principles of analog modulations with their noise conditions. Fundamental course for further study focusing on communication, measurement and signal processing. AE8B37SSP Statistical Signal Processing The course provides fundamentals in three main domains of the statistical signal processing: 1) estimation theory, 2) detection theory, 3) optimal and adaptive filtering. The statistical signal processing is a core theory with many applications ranging from digital communications, audio and video processing, radar and radio navigation, measurement and experiment evaluation, etc AE8B38EME **Electronic Measurements** The course is focused to metrology fundamentals and uncertainty apparatus. It explains both elementary principles and selected advanced methods used in electronics, telecommunications and radio communications. Safety in Electrical Engineering for a bachelor's degree 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. Basic health and occupational safety regulations 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 <a href="http://bilakniha.cvut.cz/en/FF.html">http://bilakniha.cvut.cz/en/FF.html</a> Generated: day 2025-11-13, time 00:07.