



RIGA TECHNICAL
UNIVERSITY

Faculty of Electronics and Telecommunications

Note! This is a preliminary list of courses. Changes may occur!

SPRING SEMESTER

BACHELOR COURSES

| Code | Course name | CP | ECTS |
|--|--|------------|------------|
| RTR107 | Introduction to Computers and Algorithms | 2.0 | 3.0 |
| Computer machinery and principle of operation. Computing systems. Data storage. The concept of algorithm. Types of algorithm record. Linear, branched and cyclic algorithms. Implementation of basic algorithms in programming languages. Word processors for text and program writing. Program debugging and execution. The concept of an operating system and its functions. | | | |
| TRT441 | Computer Technologies in Research | 3.0 | 4.5 |
| The course acquaints students with application possibilities of modern computer technologies in research in engineering sciences. The areas of use of popular application packages and their features are considered. The main attention is paid to mastering of universal mathematically oriented packages MathCad and MATLAB. | | | |
| TRT215 | Fundamentals of Circuit Theory | 3.0 | 4.5 |
| This basic course provides foundation knowledge of circuits theory. It aims to master methods for calculating and analysing linear electrical circuits by using Ohm's and Kirschoff's laws. The course also includes application of complex numbers and vector diagrams for calculating linear alternate current circuits. Finally, students are familiarized with concept of two-port networks, their parameters and calculation/transform methods. | | | |
| RTR223 | Electrical Engineering Theory | 6.0 | 9.0 |
| Circuits elements, parameters and fundamental laws: current, voltage, resistance, power, energy, ideally linear elements R, L, C, ideal and real current and voltage sources, Ohm's and Kirchoff's laws. Resistive circuits, their analysis methods: current and voltage division rule, Thevenin, Norton and superpozition theorems. Sinusoidal steady state theory and analysis in frequency domain: complex impedance and admittance, phasors and phasor diagrams. Magnetically coupled circuits. Resonances in RLC series and parallel circuits. Three-phase power systems analysis.. | | | |
| RAE306 | Digital Switching Systems | 4.0 | 6.0 |
| In this study course students are introduced with digital switching systems that are reviewed from the perspective of circuit and packet switched networks. Study course provides students with an in-depth understanding of telecommunication network operational principles, hence increasing students' professional and theoretical knowledge in the telecommunication industry.. | | | |
| RAE348 | Telecommunications and Computer Networks | 3.0 | 4.5 |
| In this study course students acquire knowledge about architecture and working principles of telecommunication and computer networks. An explanation of ISO OSI 7-layer reference model and TCP/IP protocol stack comparison is provided. Students learn computation principles of Ethernet transmission medium, local computer network design, development and virtualization. Students also gain an understanding of different network types - local, metropolitan, territorial, their differences and available transmission technologies. Students learn how to protect a computer network against loops by using Spanning Tree Algorithm (STA) and STP protocols. | | | |
| TRT203 | Semiconductor Devices | 3.0 | 4.5 |
| The study course provides a basic understanding of the principles of operation of a semiconductor device. The basic mechanisms of electrical conduction and parameters for semiconductors are considered. Students are introduced to the principles of semiconductors and sensors. | | | |
| RTR207 | Computerization of Mathematical Tasks in Electrical Engineering | 3.0 | 4.5 |
| The study course is designed to familiarise students with the mathematical package MATLAB. The following topics are discussed: symbolic and numerical technical computing, technical computing and programming in MATLAB (ML), programming, matrix computing, approximation, interpolation, numerical integration, solving differential equations. | | | |

Note! Full course description available by clicking on the course code!

MASTER COURSES

(available only to graduate students)

| Code | Course name | CP | ECTS |
|---|--|------------|------------|
| RAE555 | Teletraffic Theory | 3.0 | 4.5 |
| <p>The course covers the experimental systems in relation to telecommunications network systems. Within the framework of the course students will discuss the network management and control methods. Students will be enabled to promote their understanding of the performance of real systems. Important part of the course is evaluation methods as well as current trends and problems in the context of Internet, mobile and broadband communications.</p> | | | |
| RAE475 | Telecommunications and Computer Networks | 5.0 | 7.5 |
| <p>Telecommunications networks and systems as a telecommunication business infrastructure are studied. Skills of using the network control and management technologies and tools, network planning skills, network simulation skills and tools are objectives of this course.</p> | | | |
| RAE553 | Signalling Systems and Protocols | 3.0 | 4.5 |
| <p>The course provides students with the necessary skills for working in the sphere of signalling and communications protocols. Aspects of compatibility, scalability and security are emphasized. Message formats, time and state diagrams of protocols are analysed. Work with protocol analysers in emulation environment provides students with necessary skills for solving problems and preparing for changes in configuration.</p> | | | |
| RDE701 | Telecommunications Theory (special course) | 5.0 | 7.5 |
| <p>The following main topics are covered in this special course: entire analytic functions and their application in signal sampling, approximation and restoration; properties of Fourier transform; signal multiplexing in multichannel systems, CDMA systems; the negentropy principle of information and its meaning for telecommunications; the influence of quantum effects on signal transmission; quantum communications; quantum cryptography; quantum computers; stochastic resonance.</p> | | | |
| RDE432 | Transmission Systems (special course) | 4.0 | 6.0 |
| <p>The course deals with transmission systems (TS) at an advanced level. It includes the theoretical analysis of TS, as well as their practical implementation. In the laboratory students are trained in the practical skills in the area of TS. The following topics are discussed: noise and its influence on transmission quality, regeneration of digital signals, baseband line codes, passband line codes, clock extraction and timing, xDSL technologies.</p> | | | |
| RAE473 | Computer Technologies in Telecommunications | 3.0 | 4.5 |
| <p>The objective of the course is to enable students to construct software by means of systematic object-oriented analysis and design. The course covers the methods for object-oriented analysis and modelling of application domains and software systems. The analysis includes description of objects and their structuring and functional specifications. The design will include the system modelling with layering and partitioning.</p> | | | |

Note! Full course description available by clicking on the course code!