



FACULTY OF ELECTRONICS AND TELECOMMUNICATIONS

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

SPRING SEMESTER

BACHELOR COURSES For students in electronics and telecommunications study programs

RTR207 Computerization of Mathematical Tasks in Electrical Engineering (*undergraduate*)

3.00 CP (4.50 ECTS)

Symbolic and numerical technical computing in electronics and telecommunications context. Technical computing and programming in MATLAB (ML). Programming, matrix computing, numerical solving of linear, nonlinear and ordinary differential equations using ML. Approximation, interpolation, numerical integration, and numerical solving of simple differential equations using ML.

https://info.rtu.lv/rtupub/disc2/printDiscEn.10603/RTR207_Computerization-of-Mathematical-Tasks-in-Electrical-Engineering.pdf

MASTER COURSES For students in electronics and telecommunications study programs

RAE555 Teletraffic Theory (*graduate*)

3.00 CP (4.50 ECTS)

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.

https://info.rtu.lv/rtupub/disc2/printDiscEn.10273/RAE555_Teletraffic-Theory.pdf

RAE475 Telecommunications and Computer Networks (*graduate*)

5.00 CP (7.5 ECTS)

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.

https://info.rtu.lv/rtupub/disc2/printDiscEn.10266/RAE475_Telecommunications-and-Computer-Networks.pdf

RAE553 Signalling Systems and Protocols (*graduate*)

3.00 CP (4.50 ECTS)

The rapid development of telecommunications branches required specialists, who would be able to analyse current situation, forecast development directions, make long-term responsible solutions about favourable signalling/protocol system selection. .

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. .

Within the framework of the course, students are acquainted with fundamental telecommunications signalling and protocols, analyse its historical development with some essential drawbacks, expand their personal vision for future task solutions in future.

https://info.rtu.lv/rtupub/disc2/printDiscEn.10272/RAE553_Signalling-Systems-and-Protocols.pdf

RDE701 Telecommunications Theory (special course) (*graduate*)

5.00 CP (7.50 ECTS)

Electric communication theory (special course) for M.Sc.students of RTU is intended to deepen their knowledge of signal sampling and approximation, of linear system theory basing on entire analytic function theory, as well as of other communication technology theoretical problems. Theory of entire analytic functions is a valuable tool in communication theory and practice because entire analytic functions in the complex plane correspond to the functions with limited spectra on the real axis. The latter are just functions which describe signals transmitted over the bandlimited communication channels. In this way it turns out that the well known sampling (Kotelnikov) theorem is merely the special case of Lagrange's interpolation formula of entire analytic functions enabling also other sampling possibilities including nonuniform sampling. Similarly, other new possibilities appear in signal approximation and in approximation error evaluation, as well as in signal restoration if only a partial information about the signal is known. Signal multiplexing in CDMA systems and the main branches of quantum information including quantum communications (mainly quantum cryptography) and quantum computers. 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.

[https://info.rtu.lv/rtupub/disc2/printDiscEn.30740/RDE701_Telecommunications-Theory-\(special-course-\).pdf](https://info.rtu.lv/rtupub/disc2/printDiscEn.30740/RDE701_Telecommunications-Theory-(special-course-).pdf)

RDE432 Transmission Systems (special course) (*graduate*)

4.00 CP (6.00 ECTS)

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.

[https://info.rtu.lv/rtupub/disc2/printDiscEn.10362/RDE432_Transmission-Systems-\(special-course\).pdf](https://info.rtu.lv/rtupub/disc2/printDiscEn.10362/RDE432_Transmission-Systems-(special-course).pdf)

RAE473 Computer Technologies in Telecommunications (*graduate*)

3.00 CP (4.50 ECTS)

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.

https://info.rtu.lv/rtupub/disc2/printDiscEn.10324/RAE473_Computer-Technologies-in-Telecommunications.pdf