



## RTU Course "Telecommunications and Computer Networks"

13104 Telekomunikāciju tīklu katedra

### General data

Code	RAE475
Course title	Telecommunications and Computer Networks
Course status in the programme	Compulsory/Courses of Limited Choice
Course level	Post-graduate Studies
Course type	Academic
Field of study	Electronics and Telecommunications
Responsible instructor	Jans Jeļinskis
Academic staff	Gunārs Lauks Andris Skrastiņš Jūlija Asmuss
Volume of the course: parts and credits points	1 part, 5.0 Credit Points, 7.5 ECTS credits
Language of instruction	LV, EN, RU
Possibility of distance learning	Planned
Maximum auditorium capacity	100
Maximum number of students per semester	100
Abstract	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.
Goals and objectives of the course in terms of competences and skills	The goal of the course is to develop theoretical knowledge and skills to perform the analysis of telecommunications networks and systems. The objective of the course are the following: <ul style="list-style-type: none"> <li>•to enable students to choose appropriate network planning methods and tools, and to provide substantiation for the choice.</li> <li>•to enable students to use meta-modeling technologies, to model and simulate basic business processes in telecommunications, to analyze processes by using Petri Nets.</li> <li>•to enable students to use meta-modeling technologies, to carry out the cost model analysis, and to provide cost evaluation.</li> <li>•to enable students to justify the selected network architecture and technologies a</li> </ul>
Structure and tasks of independent studies	The following forms of classes are offered within the framework of the study course: lectures, seminars and practical classes. Basic methodology of this course is interactive business game. Exercises as business game documents are an essential part of the course. The material will be presented rigorously during the practical classes for the most important results. Additional material is made available at the class websites.
Recommended literature	<ol style="list-style-type: none"> <li>1.Lauks G, Teletrafika teorija, Lekciju konspekts, RTU, 2007 gads</li> <li>2.Kavacis A, Lauks G , Daudzprotokolu iezīmju komutēšana MPLS, RTU, Rīga , 2008</li> <li>3.R. Alsīņa Mācies plānot. Biznesa plāna pamati . Kamene,2008</li> <li>4.K. G. Hofš Biznesa ekonomika , Jāņa Rozes apgāds 2002</li> <li>5.Projektu vadība. ORTUS. TDT</li> <li>6.A. Klauss Zinības vadītājam. Preses nams, 2002</li> <li>7. G. Lauks Telekomunikāciju un datoru tīkli. Lekciju konspekts</li> <li>8. Scott F. Midkiff Network Performance, Design, and Management, Bradley Department of Electrical and Computer Engineering, Virginia Polytechnic Institute and State University</li> <li>9.ITU-T un ETSI rekomendācijas. ORTUS. TDT</li> <li>10.LV SPRK dokumenti: mājas lapā www.sprk.gov.lv</li> <li>11.Programmas WEKA apraksts. ORTUS. TDT</li> <li>12.Programmas MS Project apraksts. ORTUS. TDT</li> <li>13.Dokumentu šabloni. ORTUS. TDT</li> <li>14. Būvnoteikumi. ORTUS. TDT</li> <li>15. Likumdošanas akti. ORTUS. TDT</li> </ol>
Course prerequisites	Telecommunications and Data Networks, Teletraffic Theory

### Course outline

Theme	Hours
Introduction. Objectives, methodology and assessment	2
Modelling, simulation and analysis of business, service and network management processes. JAVA-based platform (UML. BP)	4
Telecommunications project management and management tools	4
Operator company management models and processes. Simulation and analysis. Tools	6
Network architecture. TMN. Functional specifications. Processes. Models and modeling tools	4
Business processes in telecommunications. Service level agreement. Assessment of basic indicators	4
Business processes in telecommunications. Modeling, simulation and forecasting of Service Demand. Tools	6
Business processes in telecommunications. TQM. Simulation tools	4
Business processes in telecommunications. Financial process management and simulation tools	6

Telecommunications services. Marketing and simulation tools	4
Telecommunications services. Market analysis by using data mining methods	4
Telecommunications services. Market analysis. Customers. Classification	4
Telecommunications services. WEB technologies and services	4
Telecommunications services. Service planning. Customer servicing processes.	4
Network management processes. Processes. Planning, installation and operation	6
Network management processes. Network resources. Management methods	4
Network management processes. Support processes. Data warehouses	4
Network management processes. Availability estimation. Simulation tools	4
Final lecture: next generation networks and technologies	2

**Learning outcomes and assessment**

Learning outcomes	Assessment methods
Students are able to make a choice and use network planning methods and tools.	Exam. Business game presentations, project documents, simulation and estimation results
Students are able to use meta-modeling technologies, to model and simulate basic business processes in telecommunications, to analyze processes by using Petri Nets.	Exam. Business game presentations, project documents, simulation and estimation results
Students are able to use meta-modeling technologies, to carry out the cost model analysis, and to provide cost evaluation.	Exam. Business game presentations, project documents, simulation and estimation results
Students are able to justify the selected network architecture and technologies according to business plans.	Exam. Business game presentations, project documents, simulation and estimation results
Students are able to forecast the demand for telecommunications services by using data mining methods and technologies.	Exam. Business game presentations, project documents, simulation and estimation results
Students are able to analyze the technical and economic aspects of telecommunications projects by using simulations.	Exam. Business game presentations, project documents, simulation and estimation results
Students are able to compose project documentation.	Exam. Business game presentations, project documents, simulation and estimation results
Students are able to use appropriate engineering methods and tools.	Exam. Business game presentations, project documents, simulation and estimation results

**Study subject structure**

Part	CP	ECTS	Hours per Week			Tests		
			Lectures	Practical	Lab.	Test	Exam	Work
1.	5.0	7.5	3.0	0.0	2.0		*	