



## RTU Course "Distributed Systems in Telecommunications"

13104 Telekomunikāciju tīklu katedra

### General data

Code	RAE359
Course title	Distributed Systems in Telecommunications
Course status in the programme	Compulsory/Courses of Limited Choice
Course level	Undergraduate Studies
Course type	Academic
Field of study	Electronics and Telecommunications
Responsible instructor	Ansis Kavacis
Volume of the course: parts and credits points	1 part, 3.0 Credit Points, 4.5 ECTS credits
Language of instruction	LV, EN, RU
Possibility of distance learning	Not planned
Abstract	The course deals with distributive systems in telecommunications. The goal of the course is to give an introduction to the distributive system problems, modelling of parallel processes and understanding of Open System Interconnection reference model (OSI - RM), functionality and architecture of telecommunications networks.
Goals and objectives of the course in terms of competences and skills	<p>The goal of the course is to provide students with knowledge about modelling, performance analysis and simulation of distributive systems. The objectives of the course are the following:</p> <ul style="list-style-type: none"> <li>•to promote understanding of the concepts, architectural elements, algorithms, and the protocols used in networks and distributed systems.</li> <li>•to develop skills that can be applied to model the protocols, algorithms, and architectural elements of networks and distributed systems.</li> <li>•to enable students to evaluate the architecture of distributive systems</li> <li>•to enhance students' understanding of the functionality of OSI RM</li> <li>•to enable students to understand the architecture and protocols of t</li> </ul>
Structure and tasks of independent studies	<p>There will be sixteen lectures and eight practical classes. Exercises are an essential part of the course. The material for the most important results will be presented rigorously during the class. Additional material is available at the class websites.</p> <p>Examination will be based on the lectures and the exercises. The grading is based on tests (50%), home works (essential) and on a final written exam (50%).</p>
Recommended literature	<ol style="list-style-type: none"> <li>1.A.Kavacis „Telekomunikāciju distributīvās sistēmas”, Rīga, RTU 2001</li> <li>2.A.Kavacis „ISDN, DSS1, CSSNo7, TCAP un SCCP”, Rīga, RTU 1995</li> <li>3„Telekomunikāciju terminu skaidrojumi”, Rīga, 2003</li> <li>4.A.Kavacis „Signalizācijas un protokoli”, Rīga, RTU 2003</li> <li>5.A.Kavacis, G.Lauks, „Daudz-protokolu iezīmju komutēšana MPLS”, Rīga, RTU 2008</li> <li>6. A.Kavacis „Telekomunikāciju programmatūra 1.daļa ”– (elektroniski) Rīga, 2006</li> </ol>
Course prerequisites	Knowledge of Teletraffic theory and telecommunications systems

### Course outline

Theme	Hours
Introduction. Objectives and methodology.	2
Introduction to parallel processes. Synchronization, concurrency, etc.	4
Modelling of parallel processes.	4
Introduction to distributive systems.	2
Properties of distributed systems.	4
Architectures of distributed systems.	4
Basic architectures of distributed systems: client–server, 3-tier architecture, n-tier architecture, distributed objects	3
Distributive computing. Grid and cloud networks.	3
Introduction to opened systems.	4
Tools and models for modelling, analyzing and simulating of parallel processes and distributive systems and networks.	6
Open System Interconnection reference model (OSI - RM).	3
Open System Interconnection (OSI) Protocols.	3
OSI Connectionless Network Service.	3
OSI Connection-Oriented Network Service	3

**Learning outcomes and assessment**

Learning outcomes	Assessment methods
Students understand the concepts, architectural elements, algorithms, and protocols used in networks and distributed systems.	•Exam •Test •Homework
Students know how to model the protocols, algorithms, and the architectural elements of networks and distributed systems.	•Exam •Test •Homework
Students can evaluate architectures of distributive systems.	•Exam •Test •Homework
Students understand the functionality of OSI RM.	•Exam •Test •Homework
Students understand and evaluate the architecture and protocols of telecommunications networks	•Exam •Test •Homework

**Study subject structure**

Part	CP	ECTS	Hours per Week			Tests		
			Lectures	Practical	Lab.	Test	Exam	Work
1.	3.0	4.5	2.0	1.0	0.0		*	