RTU Course "Network Reliability"

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General data

Code	TRL326
Course title	Network Reliability
Course status in the programme	Compulsory/Courses of Limited Choice
Responsible instructor	Ernests Pētersons
Volume of the course: parts and credits points	1 part, 3.0 Credit Points, 4.5 ECTS credits
Language of instruction	LV, EN
Annotation	It is very important to provide uninterrupted service in modern computer networks and network solutions. The study course is intended for bachelor level students and provides basic concepts on computer networks and its components reliability, as well as the methods to improve them. The study course describes both methods based on software and hardware configuration. The important part of the study course is related to the analysis of reliability and its performance evaluation, which allows comparing different solutions.
Goals and objectives of the course in terms of competences and skills	The goal of the study course is to provide knowledge on transport telematics systems reliability, including reliability criteria, system's reliability evaluation and improvement possibilities. The main tasks of the study course: to provide basic knowledge on computer networks reliability; to explain possible ways of evaluating reliability; to provide knowledge on methods of improving reliability.
Structure and tasks of independent studies	The independent work will be organized in the form of individual work on specifics of different transport telematic systems by using offered electronic materials. These materials will be used by students to prepare presentations for seminars. The knowledge assessment will be performed during final exam.
Recommended literature	Obligātā/Obligatory: 1. Rausand M., Barros A., Hoyland A. System Reliability Theory: Models, Statistical Methods, and Applications, 3rd Edition. Wiley. 2020. 2. Gertsbakh I., Shpugin Y. Network Reliability: a Lecture Course. Springerlink. 2020. Papildu/Additional: 1. Robert C. Brenner. IBM Personal Computer Troubleshooting and Repair, Howard&Sons Company. 1999. 2. Realibility and Quality Measurements for Telecommunications System. FR – 929 CD- ROM. Telecordia Technologies, NJ. 2000.
Course prerequisites	Computer networks

Course contents

Content	Full- and part-time intramural studies		Part time extramural studies	
	Contact Hours	Indep. work	Contact Hours	Indep. work
System reliability and its criteria.	5	5	0	0
Redundancy in computer systems and networks.	5	5	0	0
Hardware, software and information redundancy.	5	5	0	0
RAID. Structural redundancy.	20	10	0	0
Network path redundancy.	20	10	0	0
Optimal redundancy. Design of network topology.	20	10	0	0
Total:	75	45	0	0

Learning outcomes and assessment

Learning outcomes	Assessment methods
Is able to describe system reliability.	Seminar presentation. Exam.
Is able to evaluate redundancy and system reliability.	Seminar presentation. Exam.
Is able to describe informational and algorithmic redundancy of hardware.	Seminar presentation. Exam.
Is able to describe RAID and structural redundancy.	Seminar presentation. Exam.
Is proficient in solving tasks related to network path redundancy, optimal redundancy and design of network topology.	Reports on practical works.

Evaluation criteria of study results

Criterion	%
Practical works	30
Seminars	30

Exam	40
Total:	100

Study subject structure

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