RTU Course "Mobile Communications Systems"

13104 null

General data

Code	RAE556
Course title	Mobile Communications Systems
Course status in the programme	Compulsory/Courses of Limited Choice
Responsible instructor	Guntis Ancāns
Academic staff	Vjačeslavs Bobrovs Lilita Ģēģere
Volume of the course: parts and credits points	1 part, 3.0 Credit Points, 4.5 ECTS credits
Language of instruction	LV, EN
Annotation	The course covers the following topics: propagation of waves in multipath environment, loss mechanisms and numerous methods of estimating the median value in mobile and cellular environment, technical parameters of such systems and methods of ensuring communication between cellular and base stations, as well as management of cellular and backbone networks.
Goals and objectives of the course in terms of competences and skills	The goal of the course: to acquire theoretical knowledge about wave propagation in multipath environment and to get familiar with the methods of estimating median loss value in mobile and cellular environment. The objectives are the following: to develop skills necessary to estimate technical parameters and to ensure communication between cellular and base stations; to enable students to enhance understanding of cellular and backbone network management..
Structure and tasks of independent studies	Without assistance, students have to solve communication problems between cellular and base stations and to provide cellular and backbone network management solutions.
Recommended literature	G.Balodis Mobilie sakari Lekciju konspekts Rīga RTU izdevniecība 2013 218 lpp. Gordon L.Stiebler Principles of Mobile Communications. Kluver Acad. Publ. 1996/97 Channels, Propagation and Antennas for Mobile Communications by Rodney Vaughan and Jorgen Bach Andersen Institution of Electrical Engineers © 2003 (753 pages)
Course prerequisites	Students are expected to have a basic knowledge of project-based software in MS Windows.

Course contents

Content	Full- and part-time intramural studies		Part time extramural studies	
	Contact Hours	Indep. work	Contact Hours	Indep. work
Multipath propagation	12	0	0	0
Simulation of propagation of radio waves	12	0	0	0
Simulation of slow and fast fading	8	0	0	0
Simulation on digital map	16	0	0	0
Total:	48	0	0	0

Learning outcomes and assessment

Learning outcomes	Assessment methods
Students are able to demonstrate their understanding of wave propagation in multipath environment; to use the methods of estimating median loss value in mobile and cellular environment.	Exam results depend on substantiation of individually chosen methods and the results of dynamic analysis.
Students are able to choose appropriate forecasting methods for calculating radio wave propagation loss in multipath and multifrequency environment for handheld mobile user equipment.	Assessment of skills necessary to estimate the grade of service in the given area.
Students are able to estimate the efficiency of a model taking into consideration time variance and area availability.	Assessment of skills necessary to calculate the mean and variance methods and to evaluate the rational approach to the given grade of service.
Students are able to estimate technical parameters, to ensure communication between mobile and base stations, to maintain cellular and backbone networks.	Students carry out practical exercises.

Study subject structure

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