



RTU Course "Aviation Electronic Device Design and Modelling"

15E02 Avionikas katedra

General data

Code	TAA710
Course title	Aviation Electronic Device Design and Modelling
Course status in the programme	Compulsory/Courses of Limited Choice
Course level	Post-graduate Studies
Course type	Professional
Field of study	Transport
Responsible instructor	Smirnovs Igors
Academic staff	Tretjakovs Sergejs Fetisovs Dmitrijs
Volume of the course: parts and credits points	1 part, 2.0 Credit Points, 3.0 ECTS credits
Language of instruction	LV, EN, RU
Possibility of distance learning	Not planned
Abstract	The subject "Aviation electronics design and modeling" is based on studying electric and electronic circuit computer modelling and Multisim analyzing system. The course covers such issues as methods of circuit design, variety of circuit analysis techniques including analysis of virtual measuring devices. Avionic equipment units are also used as modelling and analysis objects.
Goals and objectives of the course in terms of competences and skills	To acquire practical skills for work using the Multisim analysis system and to increase the level of understanding of the material, which was acquired during theoretical studies. To acquire the methodology of planning and carrying out experiments. To acquire practical skills in computer modelling and analysis of avionic equipment nodes.
Structure and tasks of independent studies	Independent work theme: "Computer modelling and analysis of aircraft radio electronic equipment (system) unit." Work with technical literature.
Recommended literature	1. Erik Luther, Janell Rodriguez. Introduction to Multisim Schematic Capture and SPICE Simulation. 2006, 78 p. 2. David Báez-López and Félix E. Guerrero-Castro. Circuit Analysis with Multisim. Morgan & Claypool, 2011, 182 p. 3. Multisim™ 8 Simulation and Capture. Component Reference Guide. 2005, 1121 p. 4. S. Smith. Microelectronic Circuits. Oxford University Press. 2011, 1456 p. 5. М.Э.Хернитер. Multisim 7. ДМК-пресс. 2006, 487 стр.
Course prerequisites	Background knowledge in computer studies, electrical engineering, electronics, digital technology.

Course outline

Theme	Hours
Electronic device circuit computer modelling and the Multisim analysis system.	2
Editing electronic device diagram.	4
Drawing charts and creating processing subprograms.	4
DC linear circuit modelling and analysis.	4
DC non-linear circuit modelling and analysis.	4
Analysis of harmonic signal effects on the quarter pole.	6
Signal analysis in time interval.	4
Digital circuit simulation.	4

Learning outcomes and assessment

Learning outcomes	Assessment methods
The student understands and is able to edit electronic device diagrams using Multisim software.	Practical work. Exam.
The student is able to create and manage charts using Multisim specialized sub-programs.	Practical work. Exam.
The student is able to model and analyze DC linear and nonlinear circuit diagrams.	Practical work. Exam.
The student is able to model quarter poles and analyze the effect of harmonic signal on it.	Practical work. Exam.
The student is able to analyze the signal time parameters using virtual measuring instruments.	Practical work. Exam.
The student is able to model and analyze digital circuits with a special operational algorithm.	Practical work. Exam.

Study subject structure

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