



RTU Course "Communication Infrastructure of Aviation"

15E02 Avionikas katedra

General data

Code	TAA532
Course title	Communication Infrastructure of Aviation
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	Berežņojs Aleksandrs
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	Subject's "Aviation Communication Infrastructure" task is to introduce students to aviation communications systems, which transmit information using pulses and digital signals and the appropriate signal processing techniques. Subject deals with modern aviation communications systems, providing voice signal and data transfer between aircraft and ground services.
Goals and objectives of the course in terms of competences and skills	To acquire pulse and digital signal processing methods and aviation communications systems, their characteristics, requirements on communication channels. To introduce with appropriate communication structures and operating algorithms and parameters. To be able to apply theoretical knowledge to solve practical tasks - aviation communication system parameter estimation and performance analysis.
Structure and tasks of independent studies	Independent work on themes: "Digital communication channels", "Aviation telemetric system".
Recommended literature	1. D.S. Stacey. Aeronautical Radio Communication Systems and Networks. Wiley-Blackwell, 2008, 350 p. 2. R. Read. The essence of Communications Theory. Prentice Hall Europe, 2005, 285 p. 3. Mike Tooley and David Wyatt. Aircraft Communications and Navigation Systems: Principles, Operation and Maintenance. Burlington, MA 01803, USA, 2007, 374 p. 4. Len Buckwalter. Avionics Training. Systems, Installation and Troubleshooting. Publ.: Avionics Communication, 2007, 278 p. 5. Wasson J.W. Avionic Systems. Operation & Maintenance. Colorado: Jeppesen Sanderson, Inc. 2004, 318 p.
Course prerequisites	Preliminary knowledge in communication system basics, aviation communications systems and networks, digital techniques.

Course outline

Theme	Hours
Aviation communication structure.	2
Non-modulated signal transmission.	4
Time division multiplexing.	2
Pulse modulation.	4
Digital modulation.	4
Mobile communication systems.	4
Very high frequencies (VHF) range data transmission systems.	4
High frequencies (HF) range data transmission systems.	4
Mobile satellite communications.	4

Learning outcomes and assessment

Learning outcomes	Assessment methods
The student understands aviation communication structure, knows communication channel tasks, main technical characteristics, specific features.	Final examination question.
The student knows digital signal transmission specific features in real communication channels, is able to assess the interference and noise effects on the signal after the signal and channel parameters, is able to evaluate the channel capacity.	Independent work, practical work and final examination question.
The student knows each type of modulation specific features, implementation techniques, is able to assess the likelihood of errors, signal to noise ratio of the channel, is able to compare different types of modulation.	Practical work and final examination question.
The student knows communication system structure, operational and technical characteristics of the system, is able to assess the advantages and disadvantages, development prospects.	Practical work and final examination question.

Study subject structure

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