RTU Course "Aircraft Aviation and Radioelectronic Equipment"

15E02 Avionikas katedra

General data

Code	TAA515
Course title	Aircraft Aviation and Radioelectronic Equipment
Course status in the programme	Compulsory/Courses of Limited Choice
Course level	Undergraduate Studies
Course type	Professional
Field of study	Transport
Responsible instructor	Trifonovs-Bogdanovs Pjotrs
Academic staff	Smirnovs Igors
Volume of the course: parts and credits points	1 part, 3.0 Credit Points, 4.5 ECTS credits
Language of instruction	LV, RU
Possibility of distance learning	Not planned
Abstract	Membrane-aneroid measuring devices. Kinematic scheme. Operating principle. Gyroscope. Main characteristics. Gyroscopic moment. Horizontal situation indicator. Kinematic scheme. Magnetic and gyroscopic rate measuring device. Systems of automatic guidance. Inertial navigation system. AC and DC power systems. Adjustment hardware. Protection blocks. Antennas, radio transmitters and receivers. Aircraft communications systems. Aircraft navigation systems. Aircraft radiolocation equipment.
Goals and objectives of the course in terms of competences and skills	Know aviation and avionic equipment and systems, tasks, parameters, principles and structures. Be able to analyze the devices and the systems in various modes. Know the basic unit of the electricity system operation principle and design. Be able to analyze the power unit functioning under different conditions. Be able to apply the theoretical knowledge in practical work - for aircraft power systems, avionics and avionic equipment maintenance.
Structure and tasks of independent studies	Learn different aircraft avionics and avionics systems and the kinematic structure of the scheme. Their modes of operation. Working with the special literature. Lessons in the Aviation Institute specialized lecture rooms.
Recommended literature	1. Helfrick A. Principles of Avionics. Avionics Communications Inc., 2007, 426 p. 2. Civil Avionics Systems. I. Moir, A. Seabridge, 2002, 416 p. 3. Module 13. Licence By Post. EASA 66. Books 14-23. HP20 1QA UK. 2008, 176 p. 4. Aviation Electronics. By Keith W. Bose, Jeppesen. Sanderson Training products, 2006, 384 p. 5. P.Trifonovs-Bogdanovs. Žiroskopiskās pilotāžas ierīces. RTU. Rīga, 2002, 102 lpp.
Course prerequisites	Prerequisites fields: physics, mathematics, electrical engineering, electronics.

Course outline

Theme	Hours
Aircraft measuring system classification.	1
Membrane-Aneroid measuring system. Operating principle. Construction.	2
Gyroscope. Main characteristics. Operating principle. Construction.	2
Aerobatic aircraft equipment.	2
Aircraft navigation systems.	4
Systems of automatic guidance.	3
DC and AC generators.	2
Voltage regulation.	2
Synchro generator frequency auto-tuning.	2
Electricity distribution.	2
Protection equipment and systems.	2
Propagation of radio waves, antennas.	2
Radio transmitters and receivers.	3
Aircraft audio system.	2
Aircraft communication systems.	3
Short-range radio navigation system.	3
Long-range and global navigation systems.	3
Aircraft landing system.	3
Aircraft radio altimeter.	2
Aircraft radiolocation equipment.	3

Learning outcomes and assessment

Learning outcomes	Assessment methods
The student knows the physical processes of typical measuring devices and systems, structures and electrical schemes.	Laboratory works question. Lab. work: Air measuring system design and circuitry.
The student is able to analyze the kinematics of aviation equipment and circuits operating in different modes.	Practical work, individual work.
The student knows the power system fundamental unit of electrical schemes and design.	Laboratory work question. Lab. work: Air power system design and circuitry.
The student is able to analyze the power system basic unit operation in different modes.	Practical work, individual work.
The student knows the avionic equipment and systems tasks, technical specifications, composition and operation principles.	Independent work and final examination question.
The student is able to check the avionic equipment and systems, to work with the built-in testing systems and specialized control-testing apparatus.	Laboratory work question. Lab. work: Aircraft communication systems. Aircraft navigation systems Aircraft radiolocation systems.

Study subject structure

Part	CP	ECTS	Hours per Week			Tests		
			Lectures	Practical	Lab.	Test	Exam	Work
1.	3.0	4.5	2.0	0.5	0.5		*	