



RTU Course "Structure Optimization of Aircraft Navigation Complexes"

15E02 Avionikas katedra

General data

Code	TAA523
Course title	Structure Optimization of Aircraft Navigation Complexes
Course status in the programme	Compulsory/Courses of Limited Choice
Course level	Post-graduate Studies
Course type	Professional
Field of study	Transport
Responsible instructor	Trifonovs-Bogdanovs Pjotrs
Academic staff	Trifonova-Bogdanova Tatjana
Volume of the course: parts and credits points	1 part, 3.0 Credit Points, 4.5 ECTS credits
Language of instruction	LV, EN, RU
Possibility of distance learning	Not planned
Abstract	Complex navigation measurements for information primary and secondary processing. Complex navigation measurements on the basis of mutual compensation and filtration of their errors. Application of synthesis methods for complex navigation measurements. Optimum algorithms of complex information processing for distance measuring systems. Optimum complex systems of angular measurements. Systems of short range radio navigation and landing complex. Complex radio navigation systems on the basis of use of satellites.
Goals and objectives of the course in terms of competences and skills	To acquire an operation of the navigation complex components. To acquire an integral operation of the aerobatic and navigation complex.
Structure and tasks of independent studies	Independently prepare reports on the topic: Structure schemes and operation modes of the different aircraft navigation complexes. Work with the specialized literature. Lessons in the aeronautical institute specialized auditorium.
Recommended literature	1. О.Бабич. Обработка информации в навигационных комплексах. Москва. Машиностроение. 1992г. 512 стр. 2. Moir I., Seabridge A. Civil Avionics Systems. Wiley-Blackwell. 2006. 396 lpp. 3. P.Trifonov-Bogdanovs. Žiroskopiskās pilotāžas ierīces. RTU. Rīga. 2002g. 64 lpp. 4. П. Трифонов-Богданов. Инерциальные навигационные системы полуаналитического типа. РАУ. 1998г. 107 стр.
Course prerequisites	Math, Aviation equipment and systems.

Course outline

Theme	Hours
Flight trajectory of an aircraft. Necessary information.	4
Components of an aircraft navigation complex and it tasks.	6
Aircraft movement with respect to the ground surface. Coriolis and gear accelerations.	6
Non-platform inertial navigation system. Algorithm, structure scheme.	8
Components of the non-platform inertial navigation system . Accelerators, gyros.	6
Errors of the non-platform inertial navigation system.	6
Radio navigation systems as a structural part of the complex. Correction.	6
Structure of the navigation complex. Operation modes. Optimization of the structure.	6

Learning outcomes and assessment

Learning outcomes	Assessment methods
The student understands the algorithm an structure scheme of the inertial navigation system.	Practical work: Inertial navigation systems. Exam.
The student knows the inertial navigation system elements.	Practical work: Inertial navigation systems. Exam.
The student knows the different tasks and characteristics of the different aircraft aerobatic complex.	Individual work, seminars. Exam.
The student understands the operation in different modes of the different aircraft navigation complex.	Individual work, seminars. Exam.

Study subject structure

Part	CP	ECTS	Hours per Week			Tests		
			Lectures	Practical	Lab.	Test	Exam	Work
1.	3.0	4.5	2.5	0.5	0.0		*	