



RTU Course "Aircraft Strength"

15E03 Lidaparātu teorijas un konstrukcijas katedra

General data

Code	TAK402
Course title	Aircraft Strength
Course status in the programme	Compulsory/Courses of Limited Choice
Course level	Undergraduate Studies
Course type	Professional
Field of study	Transport
Responsible instructor	Paramonovs Jurijs
Academic staff	Kleinhofs Mārtiņš
Volume of the course: parts and credits points	2 parts, 4.0 Credit Points, 6.0 ECTS credits
Language of instruction	LV
Possibility of distance learning	Not planned
Maximum auditorium capacity	30
Maximum number of students per semester	30
Abstract	Civil aircraft classification. Wing structure and static strength. Aircraft structure fatigue life and reliability. Control surfaces, tail unit. Flaps and slats. Fuselage. Landing gear. Control system. Hydraulic system. Arrangement and mount of engine. Aircraft oscillation and aeroelasticity.
Goals and objectives of the course in terms of competences and skills	To study the airplane structure, to understand the influence of flight loads on the airplane detail design (wing, flaps and slats, fuselage, landing gear, control surface, control system, engine mount) and to be able to do the strength analysis and parameter definition of the airplane structure details.
Structure and tasks of independent studies	Every student defines the wing loads for an airplane with the specific parameters and then does the wing detail design (skin, stringers, spar boom), does the strength analysis of different type of engine mount.
Recommended literature	<ol style="list-style-type: none"> 1. Paramonovs Ju. M. Transporta līdzekļu slodzes, resursi un drošums. // RTU, Av. Institūts, 2002. - 108 lpp. 2. Paramonov Yu. M. Aeroplane structure and strength analysis. Part 2// RTU, Av. institūts. 2002 - 102 lpp, 3. Paramonov Yu. M. Aeroplane structure and strength analysis. Part 1// RTU, Av. institūts. 2009 - 120 lpp. 4. Magson T.H.G. Aircraft structures for engineering students. Elsevier Ltd, 2007, 804 p. 5. Filding J. P. Introduction to aircraft design. University Press, Cambridge, 2003, 264 p. 6. Stinton D. The design of the aeroplane. Blackwell Science. University Press, Cambridge, 1997, 642 p. 7. ICAO un EASA normatīvā dokumentācija (JAR-21, JAR-23).
Course prerequisites	Mathematics, theory of probability and mathematics statistics, strength of material, aerodynamics

Course outline

Theme	Hours
Civil aircraft classification.	2
Wing.	8
Control surfaces, tail unit.	6
Flaps and slats.	6
Fuselage.	8
Landing gear.	12
Arrangement and mount of engine.	6
Control system.	8
Hydraulic system.	2
Aircraft oscillation and aeroelasticity.	6

Learning outcomes and assessment

Learning outcomes	Assessment methods
To be able to do the airplane loads analysis and the wing cross section design.	Home work, test.
To be able to do strength analysis of flap.	Home work, test.
To be able to do strength analysis of fuselage.	Home work, test.
To be able to do strength analysis of landing gear.	Laboratory works, test.
To be able to do strength analysis of engine mounting.	Laboratory works, test.
To be able to do strength analysis of flutter.	Laboratory works, test.
Airplane structure strength analysis.	Examination.

Study subject structure

Part	CP	ECTS	Hours per Week			Tests		
			Lectures	Practical	Lab.	Test	Exam	Work
1.	2.0	3.0	1.5	0.5	0.0		*	
2.	2.0	3.0	1.0	0.0	1.0		*	