



## RTU Course "Light Aircraft Conceptual Design"

15E01 Aeronautikas tehnoloģiju katedra

### General data

Code	TAK431
Course title	Light Aircraft Conceptual Design
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	1 part, 2.0 Credit Points, 3.0 ECTS credits
Language of instruction	LV, EN, RU
Possibility of distance learning	Not planned
Abstract	The course "Light aircraft design" is based on the "General aircraft design" and the theoretical basis of the aerodynamic and airplane structure strength analysis. The subject covers such issues as market survey (demand and supply), light airplane specification and mass analysis, light airplane mass calculation as a function of airplane parameters, specific features of airworthiness requirements to a light airplane, specific features of the structure, engine and system of a modern light airplane, computer-aided design of light airplane parts (wing, fuselage, landing gear, systems).
Goals and objectives of the course in terms of competences and skills	To gain knowledge about the airplane and its system design, problem statement. To be able to find this problem solution method. To get knowledge about the aircraft technical parameters interconnection, airplane mass calculation. To get skills of making an airplane draft design.
Structure and tasks of independent studies	Independent work on the theme: "Light airplane mass calculation". Work with technical literature and internet.
Recommended literature	1. Filding J. P. Introduction to aircraft design. University Press, Cambridge, 2003, 264 p. 2. Mair W. A. and Birdsall D.L. Aircraft Performance. Cambridge University Press. 2003, 300 p. 3. Stinton D. The design of the aeroplane. Blackwell Science. University Press. Cambridge, 1997, 642 p. 4. Paramonov Yu.M. Aeroplane structure and strength analysis. Riga: RTU, 2009, 122 p. 5. ICAO un EASA normatīvā dokumentācija (JAR-21, JAR-23).
Course prerequisites	Strength of material, aerodynamics, aviation engine theory, civil aviation airplanes and engines.

### Course outline

Theme	Hours
Light airplane classification.	2
Airplane mass analysis.	2
Fuel mass calculation.	2
Engine mass calculation.	2
Airplane structure mass calculation.	4
Airplane arrangement and mass centre calculation.	6
Design of an airplane system.	6
Design of details.	4
Drawings. Technical documentation.	4

### Learning outcomes and assessment

Learning outcomes	Assessment methods
The student is able to analyse the light airplane market demand.	Exam.
The student can make the airplane and its system design problem statement.	Exam.
The student is able to analyse the airplane mass and calculate the airplane and its part mass.	Practical work questions. Exam.
The student knows and is able to make the airplane arrangement and calculation of mass centre.	Practical work questions. Exam.
The student gets skills of making the airplane draft design and preparing technical documentation.	Independent work questions. Exam.

### Study subject structure

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