



RTU Course "Helicopter Structure"

15E01 Aeronautikas tehnoloģiju katedra

General data

Code	TAK103
Course title	Helicopter Structure
Course status in the programme	Compulsory/Courses of Limited Choice
Course level	Undergraduate Studies
Course type	Professional
Field of study	Transport
Responsible instructor	Kleinhofs Mārtiņš
Academic staff	Hauka Māris
Volume of the course: parts and credits points	2 parts, 5.0 Credit Points, 7.5 ECTS credits
Language of instruction	LV, EN, RU
Possibility of distance learning	Not planned
Abstract	1. Units of helicopter structure. Airframe structure of a helicopter: a fuselage and tail balk. Main rotor of a helicopter. Flight control surfaces and control devices. A landing gear of a helicopter. Helicopter systems: fuel, fire protection, and anti-icing systems. A cabin and its equipment. Avionic. 2. Main principles of airframe structure. Classification of airframe structures. Requirements of flight ability. Loads and stress in structures. Operation and structure of rotor. Design of airframe components and joining methods of components. Methods of surface protection. Landing gear types and loads. Loads and calculation of control systems. Fluctuation of structure. Study parameters of dampers and tires; landing gear, fluctuation of control system and wing structure.
Goals and objectives of the course in terms of competences and skills	Knowledge of the helicopter structure and design philosophy. Knowledge of the principles of helicopter systems operation. To have a grasp of systems and its unit working, being able to test the system on the boards and airplane cockpits simulators. Knowledge of aircraft systems
Structure and tasks of independent studies	Based on literature research to make a course work and to do demonstration of some of the systems. Perform practical tasks concerning the structure, control systems and chassis.
Recommended literature	1. Pavelko V. Gaisakuģu aerodinamika. Rīga, RTU izdevniecība, 2009.-258 lpp. 2. A&P Technician AIRFRAME. Textbook. Colorado. Jeppesen Sanderson Inc. 2002.- 650p. 3. Airoplane Structure and Strength Analysis. Part 2. RTU, Riga 2002.g. 102p. 4. Kroes M.I., William A. Watkins, Frank Delp Aircraft Maintenance. Repair. Sixth Edition, New York, 2002, 650p. GLENCOE Aviation Technology Series 5. Helikoptera Mi-8 rokasgrāmatas, 8 sējumi. Maskava, 1978-1994. 6. Основы конструкции вертолетов. Ред. С.С.Фатеев, . Москва, 1990.-248.стр.
Course prerequisites	Second school education, Mathematics, Physics

Course outline

Theme	Hours
Praktiskie darbi, praktiskie uzdevumi, eksāmens, tests.	4
Helicopter Theory of Flight - Rotary Wing Aerodynamics	4
Helicopter basic design	4
Airframe structures (fuselage, wing, stabilizer.)	4
Main and tail rotor, blade, transmissions	4
Flight control systems	4
Landing Gear;Construction, shock absorbing; wheels, tyres, brakes	4
Helicopter fluid and gas general description (hydraulic, fuels, pneumatic systems)	4
Helicopter passenger life support systems (oxygen,air conditioning and cabin pressurization systems;Equipment and furnishings)	4
Aircraft safety systems (fire safety and de-icing systems, emergency and rescue)	4
Practical work	32
Laboratory work	8

Learning outcomes and assessment

Learning outcomes	Assessment methods
Student is familiar with helicopter structure.	Practical work, practical tasks, exam, test
Student knows aircraft classification, designing process	Practical work, practical tasks, exam, test
Student knows helicopter danger zones.	Exam, test
Student knows the basic helicopter systems and its operation	Practical work, practical tasks, exam, test
Student know system failure results	Practical work, practical tasks, exam, test

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		*	
2.	3.0	4.5	1.5	1.0	0.5		*	