



RTU Course "Theory of Aircraft Engines"

15E01 Aeronautikas tehnoloģiju katedra

General data

Code	TAE307
Course title	Theory of Aircraft Engines
Course status in the programme	Compulsory/Courses of Limited Choice
Course level	Undergraduate Studies
Course type	Professional
Field of study	Transport
Responsible instructor	Ozoliņš Ilmārs
Academic staff	Lejnieks Ernests
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	The course "Aviation engine theory" is based on the classification, operating principle, work processes, main parameters, and operating characteristics as well as study of different types of gas turbine engines.
Goals and objectives of the course in terms of competences and skills	To learn different types of gas turbine engines, their differences, operating principles, parameters and characteristics. To learn the gas turbine engine parameters determination using the modern software.
Structure and tasks of independent studies	Work with the literature and internet. Main parameters of the internal combustion engine are determined.
Recommended literature	<ol style="list-style-type: none"> 1. Klaus Hunecke. Jet Engines: Fundamentals of Theory, Design and Operation. 2004. 2. Labendiks V., Pavelko I., Pikke R. Turbīnas gāzdinamiskais aprēķins. Rīga: RTU, 2001, 34 lpp. 3. A&P Technician Powerplant Textbook. Colorado: Jeppesen Sanderson, Inc. 1994. 550p. 4. Nicholas Cumpsty. Jet Propulsion: A Simple Guide to the Aerodynamic and Thermodynamic Design and Performance of Jet Engines. Second Edition. 2005. 5. В.В.Кулагин. Теория, расчет и проектирование авиационных двигателей и энергетических установок. Москва, "Машиностроение", 2002. 6. Тихонов И.Д. Рабочий процесс и эксплуатационные характеристики авиационных ГТД /тексты лекций, - Рига: РАУ, 1991.
Course prerequisites	Physics.

Course outline

Theme	Hours
Development history and classification of gas turbine engine.	6
Operating principles of different types of gas turbine engine, as well as thrust, performance and power determination.	6
Specifics of operation and characteristics of gas turbine engine inlet and exhaust units.	6
Specifics of operation and characteristics of gas turbine engine compression and expansion units.	6
Gas turbine engine combustion process and its characteristics.	6
The influence of operational factors on the characteristics of gas turbine engines.	6
Application of modern software for definition of engine work cycles parameters.	6
Development trends and perspectives of gas turbine engines.	6

Learning outcomes and assessment

Learning outcomes	Assessment methods
Students know the history of development, classification and development tendencies of gas turbine engines.	Test, exam.
Students know and can determine the basic parameters of the gas turbine engine.	Test, exam.
Students understand relationships in different units of the gas turbine engine.	Test, exam.
Students are able to apply modern software for determining gas turbine engine parameters.	Independent work, exam.
Students know operational factors and are able to analyse their influence on the indices of gas turbine engines.	Test, exam.

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		*	