RTU Course "Engineering diagnostics of an aircraft"

15E01 Aeronautikas tehnoloģiju katedra

General data

Code	TAE515
Course title	Engineering diagnostics of an aircraft
Course status in the programme	Compulsory/Courses of Limited Choice
Course level	Post-graduate Studies
Course type	Professional
Field of study	Transport
Responsible instructor	Urbahs Aleksandrs
Academic staff	Muhins Valerijs
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	Processes of different failure formation in aviation equipment under working loads. Problems of theoretical and applied diagnostics and of non-destructive testing of an airframe, engine, separate functional systems and components of aviation structures. Special procedures and methods of detecting failures and malfunctions in components of complex aviation equipment systems. Mathematical modelling and prediction of service life of aviation equipment.
Goals and objectives of the course in terms of competences and skills	To acquire methods and devices for aircraft and aviation engine diagnostics, methods and technologies for their servicing and preventive maintenance, as well as methods for predicting the technical condition of aviation equipment.
Structure and tasks of independent studies	Independent work with technical literature, regulatory documents including the materials of European Commission Regulation (EC) No 2042/2003 (20 November 2003). Drawing up laboratory works, preparing reports and presentations.
Recommended literature	1.Urbahs A., Boldirevs J., Urbaha M., Carjova K. Mašīnu diagnostikas un nesagraujošās kontroles metodes. Lekciju konspekts, RTU, 2013. - 254 lpp. 2.Urbahs A., Boldirevs J., Korhs J., Urbaha M., Carjova K. Nesagraujošās kontroles metodes. Metodiskie norādījumi laboratorijas darbiem, RTU, 2013. -85 lpp. 3.Paul E. Mix, Introduction to Nondestructive Testing, A Training Guide, Second Edition. – New Jersey: John Wiley & Sons, 2005. – 681 pages. 4.M.J. Kroes Aircraft Maitenance & Repair Sixth Editon, Clencoe, New York, 1993, 650 lpp. 5.Kinnison H.A. Aviation Maintenance Management. – New York: McGraw-Hill, 2004. - 300 p. 6.FAR Handbook for Aviation Maintenance Technicians. Englewood: Jeppesen Sanderson, Inc. 2002. 7.Урбах А. Диагностика повреждений и прогнозирование разрушений авиационных конструкций акустико-эмиссионным методом. - Рига, Рижский авиационный университет, 1996, 123 с. 8.Пивоваров В.А. Повреждаемость и диагностирование авиационных конструкций.– Москва, Транспорт, 1994. 206 с. 9.Ямпольский В.И. и др.Контроль и диагностирование гражданской авиационной техники. - Москва, Транспорт, 1990. 182 с. 10.Eiropas Komisijas(EK) Regula Nr.2042 / 2003 (no 20.03.2003.): Training Course PART 66/147, 2004. 11.Latvija civilās aviācijas normatīvie dokumenti. LCAA, Latvijas vēstnesis, 1999- 2013.
Course prerequisites	Background knowledge of aircraft and aviation engine construction.

Course outline

Theme	Hours
Aviation equipment as a diagnostic object.Types of aviation equipment technical condition.	4
Types of aviation equipment defects and visual inspection equipment; non-destructive testing methods and devices.	4
Diagnostic systems. Automation of diagnostic procedures.	4
Mathematical models for diagnostics.Predicting the technical condition of aviation equipment.	4
Practical works:Choosing a set of diagnostic parameters, assessment of significance and optimization of testing.	16
Laboratory works:Methods and devices for the diagnostics of aircraft and aviation engines in maintenance and repair.	16

Learning outcomes and assessment

Learning outcomes	Assessment methods
A student can describe an aircraft and aviation engine as a diagnostic object.	Practical and laboratory works, exam.
A student can apply methods and devices for visual inspection, diagnostics and non-destructive testing.	Practical works, laboratory works, exam.
A student can carry out diagnostics of aviation equipment and detect defects during maintenance and repair.	Practical works, laboratory works, exam.
A student can calculate diagnostic indicators of aviation equipment objects by using methods and devices that are accepted in aviation.	Calculation tasks, practical classes. Defending the results of calculation tasks.

A student can predict the technical condition of aviation equipment.	Calculation tasks, practical classes. Defending the results of calculation tasks.

Study subject structure

Part	CP	ECTS	Hours per Week			Tests		
			Lectures	Practical	Lab.	Test	Exam	Work
1.	3.0	4.5	1.0	1.0	1.0		*	