



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Aircraft engine tests and diagnostics

Course

Field of study

Year/Semester

Aviation

Area of study (specialization)

Profile of study

Aircraft engines and airframes

general academic

Level of study

Course offered in

First-cycle studies

polish

Form of study

Requirements

full-time

elective

Number of hours

Lecture

Laboratory classes

Other (e.g. online)

15

15

Tutorials

Projects/seminars

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

Responsible for the course/lecturer:

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Prerequisites

Basic knowledge of mechanics, metrology, material strength and machine construction. He can apply the scientific method in solving problems, carrying out experiments and inference. He knows the limits of his own knowledge and skills; can formulate questions precisely, understand the need for further education

Course objective

The aim of the course is to learn theoretical and practical issues related to research and diagnostics of aircraft engines, including: the scope of engine tests and methods of diagnosis, diagnostic modeling and forecasting future states of aircraft engines.

Course-related learning outcomes

Knowledge



the student has knowledge of aviation safety and management. The student knows the concept of the human factor and methods of assessing human reliability, has detailed knowledge related to selected issues in the field of human capabilities and limitations during aircraft operation in flight, its impact on health and the ability to perform air operations, as well as the possibility of improving physical condition

has the ability to self-study with the use of modern teaching tools, such as remote lectures, websites and databases, teaching programs, e-books

Skills

is able to obtain information from various sources, including literature and databases, both in Polish and in English, integrate them properly, interpret them and make a critical evaluation, draw conclusions and exhaustively justify the opinions they formulate

is able to properly use information and communication techniques, applicable at various stages of the implementation of aviation projects

can see legal aspects in the process of formulating and solving tasks in air transport, in particular, use the aspects of European and national aviation law regulations

can assess - at least in a basic scope - various aspects of the risk associated with a logistics undertaking in air transport

is able to organize, cooperate and work in a group, assuming various roles in it, and is able to properly define priorities for the implementation of a task set by himself or others

is able to plan and implement the process of own permanent learning and knows the possibilities of further education (2nd and 3rd degree studies, postgraduate studies, courses and exams conducted by universities, companies and professional organizations)

Social competences

is able to think and act in an entrepreneurial way, incl. finding commercial applications for the created system, bearing in mind not only the business benefits, but also the social benefits of the activity

is aware of the social role of a technical university graduate, in particular understands the need to formulate and provide the society, in an appropriate form, with information and opinions on engineering activities, technological achievements, as well as the achievements and traditions of the engineer profession

correctly identifies and resolves dilemmas related to the profession of an aerospace engineer

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Knowledge acquired as part of the lecture is verified by a 45-minute test carried out on the 7th lecture. Colloquium consists of questions (test and open), variously scored. Passing threshold: 50% of points.



Skills acquired as part of the laboratory classes are verified on the basis of the final test, consisting of tasks scored differently depending on their level of difficulty. Passing threshold: 50% of points.

Programme content

Basic stages of engine testing. The role and scope of bench tests and during flight. Braking of aircraft engines and their capabilities. Technical measures in aircraft engine tests. Methods of bench tests and during flight of aircraft engines. Determination of operating parameters and characteristics of aircraft engines. Registration and processing of results from engine tests

PART - 66 (THEORY - 11.25 hours, PRACTICE - 11.25 hours)

MODULE 6. MATERIALS AND EQUIPMENT

6.4 Corrosion

b) Types of corrosion and their identification;

The causes of corrosion;

Types of materials, susceptibility to corrosion. [1]

MODULE 7A. MAINTENANCE ACTIVITIES

7.18 Disassembly, Inspection, Repair and Assembly Techniques

d) Disassembly and reassembly techniques. [2]

e) Troubleshooting techniques. [2]

Teaching methods

1. Lecture: multimedia presentation, illustrated with examples given on the board.

2. Laboratory exercises: multimedia presentation illustrated with examples given on a blackboard and performance of tasks given by the teacher - practical exercises.

Bibliography

Basic

1. Bukowski J., Łucjanek W., Napęd śmigłowy. Teoria i konstrukcja, Wyd. MON, Warszawa 1986r

2. Mysłowski J., Doładowanie silników, Wyd. Komunikacji i Łączności, Warszawa 2006r

3. R.B. Randall: Vibration based condition monitoring, Wiley, 2011.

4. Niziński S. Michalski R.: Diagnostyka obiektów technicznych. Monograficzna seria wydawnicza Biblioteka Problemów Eksploatacji, Warszawa - Sulejówek - Olsztyn - Radom, 2002.

5. J. Marciniak: Diagnostyka techniczna kolejowych pojazdów szynowych. WKiŁ, Warszawa 1982.



6. B. Żółtowski: Podstawy diagnostyki maszyn. Wydawnictwo. Uczelniane Akademii Techniczno-Rolniczej w Bydgoszczy, Bydgoszcz 1996.

7. C. Cempel, F. Tomaszewski: Diagnostyka Maszyn. Zasady ogólne, przykłady zastosowań. M.C.N.E.M.T, Radom 1992.

Additional

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,0
Classes requiring direct contact with the teacher	30	1,3
Student's own work (literature studies, preparation for laboratory classes, preparation for tests) ¹	20	0,7

¹ delete or add other activities as appropriate