COURSE DESCRIPTION CARD - SYLLABUS

Course name

Construction of jet units

Course

Field of study

Aviation

Year/Semester

2/4

Area of study (specialization)

Aircraft engines and airframes

Profile of study

general academic

Level of study

First-cycle studies

Course offered in

polish

Form of study

full-time

Requirements

elective

Number of hours

Lecture

20

Laboratory classes

15

Other (e.g. online)

-0

Tutorials

20

Projects/seminars

-0

Number of credit points

4

Lecturers

Responsible for the course/lecturer:

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Maszyn Roboczych i Transportu

ul. Piotrowo 3; 60-965 Poznań

Responsible for the course/lecturer:

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Prerequisites

Basic knowledge of technical drawing, mechanics, strength of materials and thermodynamics.

Course objective

To familiarize students with issues related to the requirements, construction and operation of aircraft assemblies for turbine engines and examples of control systems implementation.

Course-related learning outcomes

Knowledge

1. has ordered, theoretically founded general knowledge covering key issues in the field of technical thermodynamics, fluid mechanics, in particular aerodynamics

2. knows the basic concepts of economics, relating in particular to air transport, has basic knowledge of managing and running a business and knows the general principles of creating and developing forms of individual entrepreneurship, especially in the aspect of aviation companies

3. 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

1. 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

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

3. 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

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

5. can analyze the strategies of enterprises and interpret their activities, and can use in practice the basic tools of strategic analysis

6. is able to estimate various types of costs, is able to verify and assess market phenomena, is able to assess the factors of economic growth and the importance of money for its development, is able to decide about economic choices in the field of consumption and production

7. 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

8. 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

1. 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

2. 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

3. 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:

written exam

final test

laboratory reports and test

Programme content

Turbine engines as a drive for aircraft engines. Requirements, construction and operational requirements for drive units and automatic turbine engine control systems. Examples of practical implementation of control systems of modern turbine engines. Operation of aircraft powered by turbine and piston engines according to standards specified in the requirements of EASA PART 66 aviation regulations

PART - 66 (THEORY - 15 hours, PRACTICE - 11.25 hours)

MODULE 16. PISTON ENGINE

16.4 Engine fuel systems

16.4.2 Fuel injection systems

Types, construction and principles of operation. [2]

Teaching methods

lecture, description, discussion, blackboard exercises, independent practical exercises, laboratories

Bibliography

Basic

1. Lotnicze silniki turbinowe : konstrukcja - eksploatacja - diagnostyka. Cz. 1Włodzimierz Balicki, Ryszard Chachurski, Paweł Głowacki, Jan Godzimski, Krzysztof Kawalec, Adam Kozakiewicz, Zbigniew Pągowski, Artur Rowiński, Jerzy Szczeciński, Stefan Szczeciński. , Wydawnictwa Naukowe Instytutu Lotnictwa. Wydawca, Wydawnictwa Naukowe Instytutu Lotnictwa, 2010

2. Lotnicze zespoły napędowe. Cz. 2 / Stefan Szczeciński, Włodzimierz Balicki, Ryszard Chachurski, Paweł Głowacki, Jan Godzimirski, Adam Kozakiewicz, Zbigniew Pągowski, Jerzy Szczeciński.Wydawnictwa Naukowe Instytutu Lotnictwa. Wydawca, Wydawnictwa Naukowe Instytutu Lotnictwa,

3.Lotnicze zespoły napędowe. Cz. 3 / Stefan Szczeciński, Włodzimierz Balicki, Ryszard Chachurski, Paweł Głowacki, Krzysztof Kawalec, Adam Kozakiewicz, Jerzy Szczeciński. Wydawnictwa Naukowe Instytutu Lotnictwa. Wydawca, Wydawnictwa Naukowe Instytutu Lotnictwa,

4. Eksploatacja silników turbinowych / Benedykt Boliński, Zdzisław Stelmaszczyk.Wydawnictwa Komunikacji i Łączności. Wydawca

5. Turbinowe silniki odrzutowe / Paweł Dzierżanowski, Walerian Kordziński, Mieczysław Łyżwiński, Jerzy Otyś, Stefan Szczeciński, Ryszard Wiaterek,Wydawnictwa Komunikacji i Łączności. Wydawca

Wydawnictwa Komunikacji i Łączności, 1983.

Additional

Rolls Royce.. The Jet Engine, Renault Printing Co Ltd, Birmingham 1986.

Boyce, Meherwan P.. Gas Turbine Engineering. Butterworth-Heinemann, Waltham, fourth edition, 2012.

Kiameh, Philip.. Power Generation Handbook. McGraw-Hill, New York, 2002.

Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,0
Classes requiring direct contact with the teacher	57	2,5
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	43	1,5

[1] delete or add other activities as appropriate