



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Construction of jet units [S1Lot2-SLiPL>BZN]

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

Course offered in

Polish

Form of study

full-time

Requirements

elective

Number of hours

Lecture

20

Laboratory classes

15

Other

0

Tutorials

20

Projects/seminars

0

Number of credit points

4,00

Coordinators

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Lecturers

Prerequisites

Mechanical and Automotive Engineering (Product Engineering)

Course objective

To familiarize students with the issues of application, construction and use operation for turbine and executive control systems.

Course-related learning outcomes

Knowledge:

has an ordered, theoretically founded general knowledge covering key issues in aerodynamics and body flow

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

has a basic knowledge of the mechanisms and laws governing human behavior and psyche

Skills:

can obtain information from various sources, including literature and databases, both in Polish and in

English, integrate them properly, interpret and critically evaluate them, draw conclusions and exhaustively justify their opinions
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
knows how to analyze the strategies of enterprises and interpret their activities and can use in practice the basic tools of strategic analysis
can estimate various types of costs, can verify and assess market phenomena, can assess the factors of economic growth and the importance of money for its development, can decide about economic choices in the field of consumption and production,
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 specific task
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:

can think and act in an entrepreneurial way, incl. finding commercial applications for the created system, taking into account not only the business benefits, but also the social benefits of the conducted activity
is aware of the social role of a graduate of a technical university, in particular understands the need to formulate and convey to the society, in an appropriate form, 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:

written exam
final test
final check has been verified

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

Course topics

PART - 66 (THEORY - 15 hours)

MODULE 16. PISTON ENGINE

16.4 Engine fuel systems

16.4.3 Electronic engine control

Operation of engine control and fuel metering systems including electronic engine management (FADEC);

System layout and components. [2]

Teaching methods

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

Bibliography

Basic:

1. Lotnicze silniki turbinowe : konstrukcja - eksploatacja - diagnostyka. Cz. 1 Włodzimierz 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 Godzimski, 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	4,00
Classes requiring direct contact with the teacher	57	2,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	43	1,50