



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Fuels and fuel systems

Course

Field of study

Aerospace Engineering

Area of study (specialization)

Onboard systems and aircraft propulsion

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

3/5

Profile of study

general academic

Course offered in

polish

Requirements

compulsory

Number of hours

Lecture

30

Laboratory classes

Other (e.g. online)

Tutorials

15

Projects/seminars

15

Number of credit points

4

Lecturers

Responsible for the course/lecturer:

dr hab. inż. Agnieszka Wróblewska, prof. PP

email: agnieszka.wroblewska@put.poznan.pl

tel. 61 665 2201

Wydział Inżynierii Środowiska i Energetyki

ul. Piotrowo 3, 60-965 Poznań

Responsible for the course/lecturer:

Prerequisites

The student has knowledge of issues related to the construction of aircraft engines and their operation. He can apply the scientific method in solving problems, knows the limitations of his own knowledge and skills.

Course objective

Familiarize yourself with the basic methods of controlling the fuel system on various types of aircraft.

Course-related learning outcomes

Knowledge

1. has expanded knowledge necessary to understand profile subjects and specialist knowledge about



construction, methods of construction, manufacture, operation, aircraft control, safety systems, economic, social and environmental impact in the field of aviation engineering for selected specialties:

1. Piloting of aircraft
 2. Aircraft engines and airframes
 3. On-board systems and aviation propulsion
2. has basic knowledge about metal, non-metallic and composite materials used in machine construction, in particular about their structure, properties, methods of production, heat and thermo-chemical treatment and the impact of plastic treatment on their strength as well as fuels, lubricants, technical gases, refrigerants e.t.c.
3. has ordered, theoretically founded general knowledge covering key issues in the field of fluid mechanics, in particular aerodynamics, i.e. ideal liquids and gases, viscous Newtonian and non-Newtonian liquids, theory of heat-flow machines

Skills

1. can use a language to a degree enabling understanding of technical texts in the field of aviation (knowledge of technical terminology)
2. has the ability to self-study using modern teaching tools, such as remote lectures, websites and databases, teaching programs, e-books
3. can draw a diagram and a simple machine element in accordance with the principles of technical drawing

Social competences

1. can properly prioritize the implementation of tasks specified by him or others based on available knowledge
2. understands the need for critical assessment of knowledge and continuous learning
3. is aware of the importance and understands the non-technical aspects and effects of engineering activities, including its impact on the environment, and the associated responsibility for the decisions taken

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: written exam. The knowledge acquired during the lecture is verified by a 90-minute test carried out during the 15th lecture. Passing threshold: 50% of points.

Tutorials: assessing solutions to tasks in tutorials, final test.

Project: The skills acquired in the lectures and tutorials are used to draw up part of the fuel system design.



Programme content

Fuel measurement and indication systems - elements of the installation, types of installations, arrangement of fuel tanks in single and multi-engine airplanes. Delivery systems. Fuel tanks. Fuel supply: gravity and pressure feed, crossfeed, construction diagram. Drain, vent and pump out. Switching and displacement. Monitoring the operation of the fuel system: use, indicators, warning systems, fuel management (sequence of switching fuel tanks), bayonet for direct measurement of fuel quantity. Refueling and emptying tanks - the sequence and methods of refueling, fuel is useless. Oil installation. Fire protection. Fire and smoke detection, warning systems. fire extinguishing systems. Controlling systems.

Teaching methods

1. Lecture: multimedia presentation, illustrated with examples given on the blackboard.
2. Exercises: performing the tasks given by the teacher
3. Project: practical design of the fuel system.

Bibliography

Basic

1. Balicki W., Szczeciński S. " Diagnozowanie lotniczych silników lotniczych", WNIL,2001, Warszawa
2. Dzierżanowski P., ŁAgosz M., Prociak R., " Konstrukcja silników lotniczych" cz. I, WAT, 1984, Warszawa
3. Cichosz E., Kordziński W., Łyżwiński M., Szczeciński S., " Charakterystyka i zastosowanie napędó", WKiŁ, 1980, Warszawa

Additional

1. Boliński B., Stelmaszyk Z., " Eksploatacja silników turbinowych", WKiŁ, 1981. Warszawa

Breakdown of average student's workload

	Hours	ECTS
Total workload	105	4,0
Classes requiring direct contact with the teacher	72	2,5
Student's own work (literature studies, project preparation and implementation, preparation for tests) ¹	33	1,5

¹ delete or add other activities as appropriate