COURSE DESCRIPTION CARD - SYLLABUS

Course name

Fluid mechanics

Course

Field of study

Aviation

Year/Semester

2/4

Area of study (specialization)

Profile of study

general academic

Level of study

First-cycle studies

Course offered in

polish

Form of study

full-time

Requirements

compulsory

Number of hours

Lecture

15

Laboratory classes

15

Other (e.g. online)

Tutorials

15

Projects/seminars

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

dr inż. Bartosz Ziegler

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Wydział Inżynierii Środowiska i Energetyki

ul. Piotrowo 3, 60-965 Poznań

Responsible for the course/lecturer:

Prerequisites

Mathematics and physics news in the field of study program. The student is able to describe the basic physical phenomena and perform calculations related to them. The student is able to determine the priorities important in solving the tasks set before him. The student demonstrates independence in solving problems, acquiring and improving acquired knowledge and skills.

Course objective

To familiarize students with the theoretical foundations and applications of fluid mechanics.

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. has knowledge of the method of presenting test results in the form of tables and graphs, performing the analysis of measurement uncertainties

3. the student knows the basic probability distributions. The student knows the basic concepts of mathematical statistics. The student knows various methods of statistical inference. Has an ordered, theoretically founded knowledge of mathematics used to analyze the results, create mathematical models and their adaptation to the numerical code

Skills

1. is able to properly plan and perform experiments, including measurements and computer simulations, interpret the obtained results, and correctly draw conclusions from them

2. can solve tasks using basic knowledge of aerodynamics, flight mechanics and body flow

Social competences

1. understands that in technology, knowledge and skills very quickly become obsolete

2. 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:

Lecture: exam

Exercises: tests

Laboratories: continuous assessment, during each class - rewarding the increase in the ability to use known issues, assessment of the report from the exercise

Programme content

Basic equations of fluid dynamics. The principle of mass conservation. The principle of conservation of angular momentum and angular momentum. Forces affecting the fluid. General motion properties of non-viscous and non-conductive fluids. Euler equation. Bernoulli's equation and its applications. The reaction exerted by the liquid stream. The principle of conservation of mass and momentum.

Teaching methods

1. Lecture: multimedia presentation and on the board.

2. Accounting exercises: examples analyzed on the board and self-made by students.

3. Laboratories: presentation of the content and course of research, supervision over their implementation.

Bibliography

Basic

1. Ciałkowski M., Mechanika Płynów. Skrypty Uczelniane. Wydawnictwo Politechniki Poznańskiej.

2. Ciałkowski M., Bartoszewicz J., Frąckowiak A., Grudziński M., Grzelczak M., Kołodziej J., Piątkowski R., Rybarczyk J., Wróblewska A., Mechanika płynów: zbiór zadań z rozwiązaniami, Wydawnictwo Politechniki Poznańskiej, Poznań 2008.

3. Prosnak W.J. Mechanika Płynów, t. I. PWN Warszawa 1971

Additional

1. . Gołębiewski C., Łuczywek E., Walicki E., Zbiór zadań z mechaniki płynów, PWN Warszawa1978

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,0
Classes requiring direct contact with the teacher	30	1,5
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam) [1]	20	0,5

[1] delete or add other activities as appropriate