COURSE DESCRIPTION CARD - SYLLABUS

Course name

Fluid mechanics

Course

Field of study	Year/Semester
Aviation	2/4
Area of study (specialization)	Profile of study
-	general academic
Level of study	Course offered in
First-cycle studies	polish
Form of study	Requirements
full-time	compulsory

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
15		
Tutorials	Projects/seminars	
15		

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

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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

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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 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

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

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

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.

PART - 66 (THEORY - 22.5 hours, PRACTICE - 11.25 hours)

MODULE 2. PHYSICS

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2.2 Mechanics

2.2.4 Fluid dynamics

b) Viscosity, fluid resistance, effects of streamlining;

Effects of compression of fluid;

Static, dynamic and total pressure: Bernoulli's law, Venturi. [2]

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	75	3,0
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]	45	1,5

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[1] delete or add other activities as appropriate