# COURSE DESCRIPTION CARD - SYLLABUS

Course name
Fluid mechanics

## Course

Field of study
Aviation

Year/Semester
2/3

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

2

## Lecturers

Responsible for the course/lecturer:
dr inż. Bartosz Ziegler

email: bartosz.ziegler@put.poznan.pl

tel. 616652344

Wydział Inżynierii Środowiska i Energetyki

ul. Piotrowo 3 60-965 Poznań

Responsible for the course/lecturer:
dr hab. inż. Damian Joachimiak

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tel. 616652209

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## 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 and theoretically founded general knowledge in the field of key technical issues and detailed knowledge of selected issues related to air transport, knows the basic techniques, methods and tools used in the process of solving tasks related to air transport, mainly of an engineering nature

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

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 flow around a body

Social competences

1. 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

## Programme content

Subject of fluid mechanics. Continuous media model. Some concepts and theorems of fluid kinematics. Power line. Current surface. Fluid element path. Acceleration of fluid element. Substantive, convective and local derivative. Circulation. The principle of mass conservation. Forces affecting the fluid. General motion properties of non-viscous and non-conductive fluids. Fluid statics. Determination of equipotential surfaces and pressure distribution. Liquid pressure on the walls of solids. Swimming and stability of floating bodies.

## Teaching methods

1. Lecture: multimedia presentation and on the board.

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

## 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 | 45 | 1,5 |
| Student's own work (literature studies, preparation for tutorials, preparation for tests) [1] | 5 | 0,5 |

[1] delete or add other activities as appropriate