

Nazwa w jęz. angielskim: Fluid mechanics

Dane dotyczące zajęć:
Information on course:

Jednostka oferująca: Wydział Inżynierii Środowiska i Energetyki // dr hab. inż. Sebastian Rulik, prof. PŚ

Course offered by: Faculty of Energy and Environmental Engineering // dr hab. inż. Sebastian Rulik, prof PŚ

Język wykładowy:
angielski
Language:
English
Strona WWW: Course homepage:
Skrócony opis:
Short description:
Introduction to fluid mechanics. Basic problems related to the field of fluid statics and dynamics are considered.
Opis:
Description:
Lecture: Issues basic fluid mechanics and its division. Properties of fluids. Forces in fluids. Terms equilibrium. Pascal's Law. Hydrostatic pressure. Hydrostatic thrust. Buoyancy, Archimedes' principle. Continuity equation. The basic equations of motion of viscous fluids. Bernoulli's equation. The dynamic pressure. Measurement of flow rate. The outflow of liquid from the tank. Discharging time of the tank. The equations of motion of viscous fluids. The dynamic similarity of flow. Hydraulic losses in the flow. Calculation of losses in the flow. Laminar and turbulent flows. Selected aspects of the compressible fluid flows.
Classes: Solving the examples to illustrate issues of the lecture: the condition of fluid equilibrium, hydrostatic pressure, buoyancy, Archimedes' principle, continuity equation, Bernoulli's equation, dynamic thrust, hydraulic losses in flow.
Laboratory: Measuring the viscosity of the liquid. Relatively stationary state at rotational motion around vertical axis. Stability of floating bodies. Determination of density using a hydrostatic balance. Determination of the hydrodynamic drag coefficient. Discharging time of the tank. Determination of the coefficient of contraction of the hole. Measuring the flow rate through the holes. Measurement of hydraulic losses. Reynolds experiment. Calibration of orifice flow meter. The study of flow around bodies in a wind tunnel.
Number of hours of classes with direct participation of academic teachers or other persons teaching courses and students
Contact hours Lecture: 30h Classes: 30h Laboratory: 15h Number of ECTS credits: 6
Literatura:

Bibliography:
1. Nakayama Y., Boucher R. F., Introduction to Fluid Mechanics, Butterworth-Heinemann, 1999 2. Cengel Y. A., Cimbala M. J., Fluid Mechanics. Fundamentals and Applications, McGraw-Hill 2010 3. Clayton T. Crowe, Donald F. Elger, John A Roberson, Barbara C Williams, Engineering Fluid Mechanics, Wiley 2009
Efekty uczenia się:
Learning outcomes:
K1A_W13 basic principles of technical and chemical thermodynamics, as well as the basic laws of heat and mass transfer and fluid mechanics K1A_U19 describe physical and chemical processes, using the laws of thermodynamics, heat and mass transfer, as well as fluid mechanics
Metody i kryteria oceniania:
Assessment methods and assessment criteria:
Lecture. Written test with open questions and tasks. Passing criteria: minimum 50% of correct answers Classes. Written test including open tasks. Laboratory. Positive evaluation of reports and short tests. Final grade: 50% lecture+30% classes + 20% laboratory

Przynależność do grup przedmiotów w cyklach:
Element of course groups in various terms:

Opis grupy przedmiotów Course group description	Cykl pocz. First term	Cykl kon. Last term
przedmioty obieralne studia stacjonarne i niestacjonarne stopień studiów – dowolny kierunek studiów – dowolny, semestr dowolny electives full-time and part-time studies degree of study - any field of study - any, semester - any	2023/2024	