GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Fluid mechanics in medicine, PG_00055750		
Field of study	Mechanical and Medical Engineering		
Date of commencement of studies	October 2021	Academic year of realisation of subject	2022/2023
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study Subject group related to scientific research in the field of study
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	2	Language of instruction	Polish
Semester of study	3	ECTS credits	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Energy and Industrial Apparatus -> Faculty of Mechanical Engineering and Ship Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Krzysztof Tesch	
	Teachers	dr inż. Marzena Banaszek dr inż. Marta Drosińska-Komor prof. dr hab. inż. Krzysztof Tesch	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	15.0	0.0	0.0	30
E-learning hours included: 0.0						

Learning activity and number of study hours

Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
Number of study hours	30	2.0	18.0	50

Subject objectives

The objective of the course is to provide basic information about fluid mechanics in IMM, which will be useful in the work of an engineer.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W08] he/she has basic knowledge related to thermodynamics and fluid mechanics and rheology	The student has a basic knowledge of thermodynamics and fluid mechanics, including bioreology	[SW1] Assessment of factual knowledge
[K6_U05] he/she is able to use analytic and modelling methods to formulate and solve engineering tasks related to the mechanical-medical area	The student is able to use analytical, simulation and computer methods to formulate and solve engineering tasks in the field of mechanical and medical engineering	[SU4] Assessment of ability to use methods and tools
[K6_U01] he/she is able to acquire knowledge and self-studying, he/she is able to find needed information in specialist books, databases and other sources, he/she is able to integrate information and draw conclusions, he/she is able to communicate by using different technics in work and outside	The student has the ability to self-study, can find the necessary information in professional literature, databases and other sources, can integrate information and formulate conclusions, and communicate using various techniques in the professional environment and outside it	[SU4] Assessment of ability to use methods and tools

Subject contents	Lecture: 1. Differential operators 2. Strem lines, trajectories, acceleration 3. Deformation of the fluid element 4. conservation equations 5. Constitutive equations for Newtonian and Newtonian fluids including blood. 6. Governing equations describing fluid motion including this blood LABORATORY: Flow visualization. Outflow from holes. Measurement of flow rates in open channels and in pipelines. Study of the flow in the aerodynamic tunnel. Modeling of gas flows by hydrodynamic analogy.
Prerequisites and co-requisites	Mathematics
Assessment methods and criteria	

Subject passing criteria	Passing threshold	Percentage of the final grade
Exam	50.0%	50.0%
Exam	50.0%	50.0%

Recommended reading	Basic literature	Tesch K., "Mechanika Płynów", Wyd. PG, 2008, 2013 Tesch K., "Wybrane Zagadnienia Modelowania Przepływów Krwi...", Wyd. PG, 2012
	Supplementary literature	Bębenek B., "Przepływy w układzie krwionośnym" Wyd. PK, 1999 Cieślicki K., "Hydrodynamiczne uwarunkowania krążenia mózgowego", Wyd. EXIT, 2001 Puzyrewski R., Sawicki J., "Podstawy Mechaniki Płynów i Hydrauliki", PWN, 1998
	eResources addresses	Adresy na platformie eNauczanie: Mechanika płynów w medycynie, W/L, sem. 3, zimowy 22/23 (PG_00055750) - Moodle ID: 25365 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=25365
Example issues/ example questions/ tasks being completed	-	
Work placement	Not applicable	

Document generated electronically. Does not require a seal or signature.