

## SDAŃSK UNIVERSITY 的 OF TECHNOLOGY

## Subject card

Subject name and code	Fluid Mechanics , PG_00040058								
Field of study	Mechanical Engineering, Mechanical Engineering								
Date of commencement of studies	October 2020		Academic year of realisation of subject			2021/2022			
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	Part-time studies		Mode of delivery			at the university			
Year of study	2		Language of instruction			Polish -			
Semester of study	4		ECTS credits			5.0			
Learning profile	general academic profile		Assessment form			exam			
Conducting unit	Department of Energy and Industrial Apparatus -> Faculty of Mechanical Engineering and Ship Technology							p Technology	
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. inż. Krzysztof Tesch						
	Teachers prof. dr hab. inż. Krzysztof Tesch								
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM	
	Number of study hours	15.0	8.0 0.0 0.0		0.0		0.0	23	
	E-learning hours included: 0.0								
	Adresy na platformie eNauczanie:								
Learning activity and number of study hours	Learning activity	Participation in classes includ plan	didactic Participation in ed in study consultation hours		Self-study SUM		SUM		
	Number of study hours	23		7.0		95.0		125	
Subject objectives	The aim of the course is to provide the student with theoretical and practical knowledge of fluid mechanics, allowing for solving engineering computational problems related to fluid mechanics.								
Learning outcomes	Course outcome		Subject outcome			Method of verification			
	[K6_W09] possesses basic knowledge within the range of thermodynamics and fluid mechanics, construction and operation of heat generating devices, process equipment, including renewable energy sources, cooling and air conditioning		The student has basic knowledge in the field of thermodynamics and fluid mechanics, construction and operation of thermal energy devices, process equipment, including renewable energy sources as well as refrigeration and air conditioning			[SW1] Assessment of factual knowledge			
	[K6_U06] is able to use mathematical and physical models for analysing the processes and phenomena occurring in mechanical devices within the range of material strength, thermodynamics and fluid mechanics		The student is able to use mathematical and physical models to analyze the processes and phenomena occurring in mechanical devices in the field of material strength, thermodynamics and fluid mechanics			[SU3] Assessment of ability to use knowledge gained from the subject			
Subject contents	LECTURE Introduction and basic definitions. Properties of fluids. Fluid models. Fluid equilibrium state. Determination of hydrostatic pressure. Archimedes' law. Methods of describing fluid movement. General fluid movement. Fluid element deformation. Swirling fluid movement. Principles of conservation of mass, momentum and energy. Balance of entropy. Navier-Stokes equation. Bernoulli equation. PRACTICAL EXERCISES Kinematics of flows. Laminar and turbulent flows in a pipe - averaging flow parameters. Practical application of Bernoulli's equation. Determination of forces acting on the walls of channels and surfaces of flowing bodies. Solving simplified forms of the Navier-Stokes equation.								
Prerequisites and co-requisites	Knowledge of differential and integral calculus, differential equations and the basics of vector calculus. Basic knowledge of classical solid state mechanics								

Assessment methods	Subject passing criteria	Passing threshold	Percentage of the final grade			
and criteria	Written exam	50.0%	100.0%			
Recommended reading	Basic literature	Tesch K.: Mechanika płynów, Wyd. Politechniki Gdańskiej, Gdańsk 2008				
	Supplementary literature Puzyrewski R., Sawicki J.: Podstawy mechaniki płynów i hyc PWN Warszawa 1998		y mechaniki płynów i hydrauliki,			
	eResources addresses					
Example issues/ example questions/ tasks being completed	-					
Work placement	Not applicable					