GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Hydraulics, PG_00044396		
Field of study	Civil 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
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	4.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Hydraulic Engineering -> Faculty of Civil and Environmental Engineering		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Michał Szydłowski	
	Teachers		

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	10.0	5.0	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	7.0	63.0	100

Subject objectives

Acquisition of knowledge and skills related to the description of the liquid state.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U07] Can design and properly dimension basic elements of construction or basic foundations of general, hydrotechnical and bridge constructions	Student calculates basic flow parameters in pipelines, channels and hydraulic devices. He studies hydraulic phenomena in the laboratory. It measures and determines the parameters of water movement. Draws conclusions regarding water movement.	
[K6_W07] has basic knowlede on natural processes (hydrological, hydraulical or geological) and its influence on building subsoil; understands specific aspects of surface and underground water, which constraints the design and exploitation of buildings and engineering objects	Student defines concepts and explains the principles of water movement in the ground environment.	
[K6_W01] has knowledge of selected branches of mathematics, physics and chemistry, which is a base of construction subjects, such as construction theory and material technology and id needed to formulate and solve typical problems of civil engineering	Student defines concepts and explains the principles of water movement in the natural environment. Specifies the nature of water flow in closed conduits and open troughs.	
[K6_U02] is able to define basic calculation models used in computer calculations	Student analyzes simplified flow models. Student calculates basic flow parameters in pipelines, channels and hydraulic devices. He studies hydraulic phenomena in the laboratory. It measures and determines the parameters of water movement. pulls out conclusions regarding water movement.	

Subject contents	LECTURE Properties of liquids. Forces in fluids. Fundamental equations in fluid flow. The classification of flows. Elements of the hydrostatics. The kinematics of liquids. Simplifications of the flow equations. Equations for one-dimensional flows. Flow in closed canals and pipes. Open channel flow. The outflow by weirs, spillway and culverts. The groundwater flow. Measurements of the fluid velocity and flow discharge. CLASSES Hydraulics computations: hydrostatics, pipelines, open channels, water filtration LABORATORY EXERCISES Analysis of flow in pipelines. Analysis of flow in open channel.
Prerequisites and co-requisites	No requirements

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Midterm colloquium	50.0%	35.0%
Written test	50.0%	50.0%
Lab reports	100.0%	15.0%

Recommended reading

Basic literature	1. Czetwertyński E., Utrysko B. „Hydraulika i hydromechanika”, PWN 1986 2. Kubrak J., „Hydraulika techniczna”, SGGW Warszawa 1998 3. Mitosek M., „Mechanika płynów w inżynierii i ochronie środowiska”, PWN 2001
Supplementary literature	1. Sawicki J., „Przepływy ze swobodna powierzchnia”, PWN Warszawa 1998.
eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	1. Computations of hydrostatic pressure and pressure forces. 2. Computations of pressure flow in pipelines. 3. Compuations of open channel hydraulics.
Work placement	Not applicable