GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00062076		
Field of study	Hydraulika i hydrologia		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2025/2026
Education level	first-cycle studies	Subject group	
Mode of study	Part-time studies	Mode of delivery	at the university
Year of study	2	Language of instruction	Polish
Semester of study	3	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Geotechnical and Hydraulic Engineering -> Faculty of Civil and Environmental Engineering -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Michał Szydłowski	
	Teachers		

Lesson types

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	0.0	0.0	30

Subject objectives

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

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U05] Conducts research (obtaining information, simulations, experimental methods) in the field of construction in order to solve specific tasks and report research results.	The student carries out hydraulic experiments in the field of flows in pipelines, open channels and in the ground, related to civil engineering.	[SU4] Ocena umiejętności korzystania z metod i narzędzi [SU5] Ocena umiejętności zaprezentowania wyników realizacji zadania
[K6_W02] Demonstrate knowledge and understanding of the processes and established methods of analysis / solution of engineering issues & problems in the field of civil engineering and of their limitations.	The student determines and analyzes the elements of the water balance of a river catchment. The student names and explains the physical processes that determine the circulation of water on the surface and in the ground. The student defines concepts and explains the principles of water movement in the natural environment. It determines the nature of water flow in closed conduits and open channels. Analyzes simplified flow models.	[SW1] Ocena wiedzy faktograficznej
[K6_U02] Analyse & solve engineering issues & problems in the field of civil engineering by applying appropriate and relevant established analytical, numerical and experimental methods.	The student solves hydraulic problems and tasks in the field of flows in pipelines, open channels and in the ground, related to civil engineering.	[SU1] Ocena realizacji zadania [SU2] Ocena umiejętności analizy informacji [SU4] Ocena umiejętności korzystania z metod i narzędzi
[K6_U01] Apply knowledge and understanding of mathematics as well as sciences and engineering disciplines underlying civil engineering to solve engineering problems and issues.	The student calculates the basic parameters of water flow in pipelines, channels and hydraulic devices. It measures and determines the parameters of water movement. He pulls it out conclusions about water movement.	[SU1] Ocena realizacji zadania [SU3] Ocena umiejętności wykorzystania wiedzy uzyskanej w ramach przedmiotu

<table>
<tr><td>Subject contents</td><td>Course content – lecture
LECTURE Fluid properties. The forces acting on the fluid. Basic equations of fluid flow. Classification of flows. Elements of hydrostatics. Kinematics of fluids. Simplify the equations of water flow. Conservation equations for one-dimensional flow. The fluid flow in closed pipes. The fluid flow in open channels. Flow of liquid through the wires. Filtration of water in the soil. Velocity and flow measurements. Hydrological cycle, hydrological characteristics of catchments. The parameters of the river basin. Water balance of the catchment. Flood, flow characteristics in rivers. CLASSES Hydraulics and hydrology computations: hydrostatics, pipelines, open channels, water filtration LABORATORY EXERCISES Analysis of flow in pipelines. Analysis of flow in open channel. Analysis of flow in ground.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>No requirements</td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Final test</td><td>60.0%</td><td>50.0%</td></tr>
<tr><td>Midterm colloquium</td><td>50.0%</td><td>25.0%</td></tr>
<tr><td>Laboratory experiments reports</td><td>100.0%</td><td>25.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>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 4. Byczkowski A., Hydrologia, SGGW 1996 5. Ojha C.S.P. et al., Engineering Hydrology, Oxford 2008</td></tr>
<tr><td>Supplementary literature</td><td>1. Sawicki J., Przepływy ze swobodna powierzchnia, PWN Warszawa 1998. 2. Van Te Chow, Open-Channel Hydraulics, McGRAW-HILL, 1957 (first ed.) 3. Van Te Chow et al., Applied Hydrology, McGRAW-HILL, 1988</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>1. Computations of hydrostatic pressure and pressure forces.
2. Computations of pressure flow in pipelines.
3. Compuations of open channel hydraulics.
4. Hydrological computations of river catchment outflow.
5. Measurments of water flow in open channels.</td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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