

SDAŃSK UNIVERSITY 的 OF TECHNOLOGY

Subject card

Subject name and code	Hydraulics and Hydrology , PG_00043958								
Field of study	Civil Engineering								
Date of commencement of studies	October 2022		Academic year of realisation of subject			2023/2024			
Education level	first-cycle studies		Subject group						
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			4.0			
Learning profile	general academic profile		Assessment form			assessment			
Conducting unit	Department of Geotechnical and Hydraulic Engineering -> Faculty of Civil and Environmental Engineering								
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Michał Szydłowski						
	Teachers		dr inż. Patrycja Mikos-Studnicka						
			mgr inż. Paweł Wielgat						
			drint Marzona Wélaik						
			ur inz. iviarzena vvojcik						
			dr inż. Wioletta Gorczewska-Langner						
			dr hab. inż. Michał Szydłowski						
			prof dr hab, inż Adam Szymkiewicz						
			pron ar naor i					_	
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM	
	Number of study hours	30.0	15.0	15.0	0.0		0.0	60	
	E-learning hours included: 0.0								
Learning activity and number of study hours	Learning activity Participation ir classes include plan		didactic Participation in consultation hours		Self-study		SUM		
	Number of study hours	60		0.0		0.0		60	
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_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] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject				
	[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] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools				
	[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] Assessment of factual knowledge				
	[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] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task				
Subject contents	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.						
Prerequisites and co-requisites	No requirements						
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade				
	Laboratory experiments reports	100.0%	25.0%				
	Midterm colloquium	50.0%	25.0%				
	Final test	60.0%	50.0%				
Recommended reading	Basic literature	re 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					
	Supplementary literature	plementary literature 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					
	eResources addresses Adressy na platformie eNauczanie: Hydraulika i hydrologia - wykład 2023/2024 - Moodle ID: 28907 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=28907 Hydraulika i hydrologia - wykład 2023/2024 - Moodle ID: 28907 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=28907						
Example issues/ example questions/ tasks being completed	 Computations of hydrostatic pressure and pressure forces. Computations of pressure flow in pipelines. Computations of open channel hydraulics. Hydrological computations of river catchment outflow. Measurments of water flow in open channels. 						
Work placement	Not applicable						