



## Subject card

Subject name and code	Hydraulics, PG_00044396						
Field of study	Civil 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		
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	Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Michał Szydłowski				
	Teachers		dr inż. Natalia Gietka				
			dr hab. inż. Michał Szydłowski				
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						
	Adresy na platformie eNauczanie: Hydraulika inżynierska 2021/2022 - Moodle ID: 21143 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=21143">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=21143</a>						
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.	[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools
	[K6_W07] has basic knowlede on natural processes (hydrological, hydraulic 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.	[SW1] Assessment of factual knowledge
	[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.	[SW1] Assessment of factual knowledge
	[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.	[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task
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	Hydraulika inżynierska 2021/2022 - Moodle ID: 21143 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=21143">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=21143</a>	
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		