GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Hydraulics II, PG_00043537		
Field of study	Environmental 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	Full-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	prof. dr hab. inż. Jerzy Sawicki	
	Teachers	dr inż. Natalia Gietka prof. dr hab. inż. Jerzy Sawicki dr inż. Patrycja Mikos-Studnicka	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	30.0	0.0	0.0	60

E-learning hours included: 0.0

Adresy na platformie eNauczanie:

Additional information:
current lectures in written form, e-films with lecturer comments, classical handbooks

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	60	4.0	39.0	103

Subject objectives

Presentation of fundamental methods of hydraulic, applied in the environmental engineering, necessary in technical practice.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W15] knows and understands the methods of measuring basic quantities characteristic for fluid mechanics and hydraulics, hydrology; knows the calculation methods and IT tools necessary to analyze the results of laboratory and field work	Student knows, understands and is able to apply basic methods of the hydraulic values measurements, and the methods of the measurements results analysis as well.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects
[K6_W05] knows the theoretical basis of hydromechanics and its practical models, necessary to solve technical problems in the field of environmental engineering (sanitary engineering, water melioration, water management and flood protection, pollution spread)	Student has an arranged and deepen knowledge in the scope of hydraulics, is able to apply technical methods of calculations and solves problems of hydraulics.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects
[K6_K01] can think and act in a creative and enterprising way; can set priorities for the implementation of an individual or group task; understands the need for continuous training and professional responsibility for their activities and team	Student is able to cooperate in a team. He understands the question of professional responsibility.	[SK3] Assessment of ability to organize work [SK1] Assessment of group work skills
[K6_U08] can use properly selected methods and devices of hydraulics and hydrology, enabling determination of basic quantities characterizing the flow of water in open channels and rivers, pipelines and flow objects of environmental engineering	Student has an arranged and deepen knowledge in the scope of hydraulics, is able to apply technical methods of calculations and solves problems of hydraulics.	[SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools
[K6_U02] can work individually and in a team; knows how to estimate the time needed to complete the task ordered; is able to develop and implement a work schedule that ensures deadlines	Student is able to work individually and in a task team, according to the work time table.	[SU1] Assessment of task fulfilment [SU5] Assessment of ability to present the results of task

Subject contents

Practical methods of groundwater flow phenomena (wells, porous banks, ditches, drains). Open-channels hydraulics (general equations of one-dimensional flow in open channels, Manning formula,non-uniform flow, swelling curve,de Saint-Venant equations). Free-jets of a liquid (submerged and non-submerged, Abramovich formulae). Hydrodynamic thrust. Modelling and similarity of hydraulic phenomena. Measurements in hydraulics.

Prerequisites and co-requisites

Polytechnical course of mathematics, fluid mechanics and firs part of the subject (Hydraulics I)

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
control works during tutorials	60.0%	30.0%
Written exam (possibility of additional talk	60.0%	70.0%

Recommended reading

Basic literature	1) Sawicki J.M., "Mechanics of flows", Wydawnictwo PG, Gdańsk 2009, 2) Orzechowski Z., Prywer J., Zarzycki R., "Mechanics of fluids in environmental engineering", WNT, Warszawa 1997. 3) Walden H., Stasiak J., "Mechanics of liquids and gases in sanitary engineering", Arkady, Warszawa 1971.
Supplementary literature	1) Grabarczyk Cz., "Liquids flows in conduits. Methods of calculations", Envirotech, Poznań 1997. 2) Kubrak E., Kubrak J., "Technical hydraulics", SGGW, Warszawa 2004.
eResources addresses	

Example issues/ example questions/ tasks being completed

1, Dimensioning of wells and trenches.

2. Hydraulic calculations of open channels.

3.Hydraulic aspects of waste-water outfalls

Work placement

Not applicable