GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00059169		
Field of study	Environmental Engineering		
Date of commencement of studies	October 2022	Academic year of realisation of subject	2024/2025
Education level	first-cycle studies	Subject group	Optional subject group 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	3	Language of instruction	Polish
Semester of study	5	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. Piotr Zima	
	Teachers	mgr inż. Dominika Kalinowska dr hab. inż. Piotr Zima dr hab. inż. Michał Szydłowski	

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	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 in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
	Number of study hours	60	5.0	45.0	110

Subject objectives	The aim of the course is to familiarize students with public domain programs used to support problem solving in sanitary engineering.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W01] has knowledge in the field of mathematics, including: linear algebra, mathematical analysis and elements of mathematical statistics, probability theory, applications of mathematics, including mathematical methods and numerical methods, necessary for: 1) description and analysis of hydrological phenomena; 2) description and analysis of meteorological phenomena; 3) solving project tasks of the sanitary industry;	The student formulates the problem of solving equations describing selected issues in the field of sanitary engineering. Describes the solution of an engineering problem using a structural algorithm. Uses basic numerical methods to solve problems. Knows how to take into account practical aspects	[SW1] Assessment of factual knowledge
[K6_U11] can use selected computer programs to support design, including CAD graphics programs	The student is able to use available public domain software packages used in sanitary engineering	[SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools
[K6_W06] has a structured and theoretically founded knowledge in the field of computer science, numerical methods and the possibilities of their applications for solving tasks, description of phenomena related to the flow of water in the environment, in open pipes and channels, filtration, migration of pollutants	The student is able to use system and application software, is able to apply specific numerical methods to solve tasks in the field of sanitary engineering	[SW1] Assessment of factual knowledge
[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	The student is able to solve tasks in the field of sanitary engineering	[SK5] Assessment of ability to solve problems that arise in practice

Subject contents

Application of public-domain programs in sanitary engineering. Application of hydroinformatics program in modeling flows in collectors and open channels on the example of using HEC-RAS/SWMM program. Introduction to HEC-RAS/SWMM program. General assumptions for describing steady longitudinal flow computational model. Nodal areas (connection and branching of streams). Numerical description of the geometry of the collector, river bed and valley. Determination of the resistance coefficient in complex channels. Principles of calculating the longitudinal system of the water surface in rivers and streams with technical development. Differentiated lengths of the flow path on flood terraces and in the main channel. Transport of dragged and lifted sediment. Unsteady flow

Prerequisites and co-requisites

Basic computer skills and operating system knowledge. Knowledge of the following subjects: mathematics, basic computer science, and fluid mechanics and hydraulics.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
lecture	60.0%	50.0%
lab	60.0%	25.0%
tutorials	60.0%	25.0%

Recommended reading

Basic literature	1. Hec-Ras manual 2. SWMM manual
Supplementary literature	1. Hec-Ras Hydaulic referens
eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	1). List and describe the Public Domain packages you know that support the work of an engineer in the field of environmental engineering? 2). List and describe the main modules of the HEC-RAS/SWMM program? 3). What data is needed to simulate river flow using one of the packages? 4). List and describe the commercial packages you know that support the work of an engineer in the field of environmental engineering?
Work placement	Not applicable

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