GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Computer Applications, PG_00042627						
Field of study	Environmental Engineering						
Date of commencement of studies	October 2021		Academic year of realisation of subject	2022/2023			
Education level	first-cycle studies		Subject group	Optional subject group Subject group related to scientific research 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	5.0			
Learning profile	general academic profile		Assessment form	exam			
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						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	20.0	0.0	0.0	35
	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	35		6.0	85.0		126
Subject objectives	Acquainting the student with the rules of working with programs supporting the work of an engineer in the field of environmental engineering.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[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)	The student is fluent in hydromechanics, knows practical models necessary for solving problems in the field of environmental 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 work in a group.	[SK1] Assessment of group work skills
[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 is fluent in mathematics and statistics.	[SW1] Assessment of factual knowledge
[K6_U11] can use selected computer programs to support design, including CAD graphics programs	The student uses software in the field of modeling flows in open channels. He knows the basics of working in the HEC-RAS hydroinformatics system. Describes the solution of an engineering problem with structural algorithm.	[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information
[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 uses software in the field of modeling flows in open channels. He knows the basics of working in the HEC-RAS hydroinformatics system. Describes the solution of an engineering problem with structural algorithm. Uses basic numerical methods to solve problems in the field of water engineering.	[SW1] Assessment of factual knowledge

Subject contents

WYKŁAD Zastosowanie programów typu public-domain w inżynierii środowiska. Zastosowanie programu hydroinformatycznego w modelowaniu przepływów w korytach otwartych na przykładzie obsługi programu HEC-RAS. Wprowadzenie do programu HEC-RAS. Ogólne założenia do opisu ustalonego przepływu podłużnego model obliczeniowy. Węzłowe obszary rzek i potoków (połączenie i rozgałęzienie strumieni). Numeryczny opis geometrii koryta i doliny rzeki. Określenie współczynnika oporu w korytach złożonych. Zasady obliczania podłużnego układu zwierciadła wody w rzekach i potokach z techniczną zabudową. Zróżnicowane długości drogi przepływu na terasach zalewowych i w korycie głównym. ĆWICZENIA LABORATORYJNE Utworzenie nowego projektu, zdefiniowanie sieci rzek, zdefiniowanie kształtów koryta w charakterystycznych przekrojach poprzecznych. Interpolacja przekrojów pośrednich. Wprowadzenie zabudowy hydrotechnicznej (mosty, przepusty, przelewy). Wprowadzenie danych przepływu ustalonego i wykonanie obliczeń.

Prerequisites and co-requisites

Basic computer skills and knowledge of the Windows operating system. Knowledge of the subject of mathematics, basics of computer science and hydraulics.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
passing the lecture	60.0%	50.0%
laboratory credit	60.0%	50.0%

Recommended reading	Basic literature	1. Szymkiewicz R. Numerical methods in water engineering, Pomeranian digital library, Gdańsk, 2013 (pdf). 2. HEC-RAS, River Analysis System, Reference Manual, US Army Corps of Engineers, Institute For Water Resources, Hydrologic Engineering Center, Davis 2003. 3. HEC-RAS, River Analysis System, Hydraulic Reference Manual, US Army Corps of Engineers, Institute For Water Resources, Hydrologic Engineering Center, Davis 2003. 4. Hydraulic bases for calculating the capacity of river beds, scientific editor. J. Kubrak, E. Nachlik, Ed. SGGW, Warsaw 2003.
	Supplementary literature	1. Fortuna Z. et. al. Numerical methods WN-T, Warsaw, 1993, 2. Ralston A. Introduction to numerical analysis, PWN, Warsaw, 1971.
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	1). List and review known Public Domain packages supporting the work of an engineer in the field of environmental engineering?2) Replace and describe the main modules of the HEC-RAS program?3). What data are needed to simulate river flow using the HEC RAS package.4). List and describe the known commercial packages supporting the work of an engineer in the field of engineeringthe environment?	
Work placement	Not applicable	