University of Gdańsk

Subject card

Subject name and code	Hydrological Modelling - lecture, PG_00201426						
Field of study	Water Management and Protection of Water Resources						
Date of commencement of studies	October 2027		Academic year of realisation of subject		2028/2029		
Education level	Bachelor's studies		Subject group		Obligatory subject group in the field of study Subject group related to practical vocational preparation		
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		3.0		
Learning profile	practical		Assessment form		exam		
Conducting unit	Department of Hydrology -> Faculty of Oceanography and Geography -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. Michał Szydłowski				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	0.0	0.0	30
	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	30		2.0		43.0	75
Subject objectives	Acquire basic knowledge of modeling hydrological processes. To acquire skills in the application of different types of modeling with the correct selection of basic modeled parameters and initial and boundary conditions. To acquire the ability to model basic hydrological processes using Excel. To learn the main objectives of using hydrological modeling. To obtain the ability to evaluate the results of different types of modeling (including forecasting, simulation).						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[GWOZWL3-W02] the importance of advanced knowledge in the sciences allowing to understand the processes and phenomena occurring in the hydrosphere, as well as knowledge of the social sciences and of the Earth's geographic environment - as a system of interrelated and interacting components.	K_W02 Understanding of hydrological processes and their mathematical and physical notation	[SW4] test/exam - oral or written
[GWOZWL3-U05] formulate opinions on basic environmental engineering issues, and explain and justify the necessity of land reclamation and construction of hydrotechnical facilities.	K_U05 is able to present and justify the basic need for hydrological and environmental engineering works resulting from the modelling carried out	[SU4] test/exam - oral or written
[GWOZWL3-K05] take responsibility for the safety of his own work and that of others, dealing with emergencies, exercising caution in the laboratory and in the field, responsibility for entrusted equipment and apparatus.	K_K05 is ready to take responsibility for social obligations and initiate actions resulting from his work , especially in the public interest	[SK4] test/exam - oral or written
[GWOZWL3-W04] research techniques, methods and tools currently used in water management and the protection of water resources, in both the natural and social sciences, including basic statistical and IT tools enabling the description, modelling and interpretation of data concerning phenomena and processes occurring in the aquatic environment, as well as tools for describing relationships within socio-ecological systems.	K_W04 Correct mathematical notation of hydrological processes with their interpretation	[SW4] test/exam - oral or written
[GWOZWL3-W01] in advanced basic biological, physical and chemical processes and phenomena, as well as analyzes their mutual relations and course in relation to natural environment and socio-ecological systems.	K_W01 Correct analysis of hydrological phenomena and relationships between available data	[SW4] test/exam - oral or written

Subject contents

1. Subject of hydrological modeling - Modeled hydrological processes and parameters, Objectives of hydrological modeling.

2. Principles and methods of modeling hydrological phenomena 3

. Statistical-empirical models

4. Rainfall-runoff model

5. Flood wave transformation models

6. Evaluation of the quality of modeling depending on its use
7.Numerical models - description of basic models (HEC-RAS)

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
test	51.0%	100.0%

Recommended reading	Basic literature	Ozga-Zielińska M., Brzeziński J., 1994, Hydrologia stosowana, Wyd. Naukowe PWN, Warszawa. Soczyńska U., 1995, Modelowanie systemów naturalnych, WGSR UW, Warszawa. Soczyńska U. (red.), 1997, Hydrologia dynamiczna, Wyd. Naukowe PWN, Warszawa Byczkowski A., 1999. Hydrologia, t. 1 i 2, Wydawnictwo SGGW Gąsiorowski D., Szymkiewicz R., 2016. Podstawy hydrologii dynamicznej. Wydawnictwa Naukowo Techniczne, Warszawa.
	Supplementary literature	Bajkiewicz-Grabowska E., Mikulski Z., 2008. Hydrologia ogólna, Wyd. Naukowe PWN. Banasik K., 2009, Wyznaczanie wezbrań powodziowych w małych zlewniach zurbanizowanych, SGGW, Warszawa HEC, 2000, HEC-HMS Technical Reference Manual, US Army Corps of Engineers Hydrologic Engineering Center 609 Second Street Davis, CA 95616-4687 USA
	eResources addresses	
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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