GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	URBAN HYDROLOGY, PG_00060009		
Field of study	Environmental Engineering		
Date of commencement of studies	February 2023	Academic year of realisation of subject	2023/2024
Education level	second-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	English
Semester of study	3	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. Katarzyna Weinerowska-Bords	
	Teachers	dr hab. inż. Katarzyna Weinerowska-Bords	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	15.0	0.0	15.0	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	38.0	103

Subject objectives

Recognizing and understanding the problem of the influence of the urbanization on hydrological processes and formation of catchment runoff. Understanding the problems of the consequences of computational method selection on accuracy of the results. Ability of application of basic methods of runoff calculation.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K7_W06	The student has in-depth knowledge of the flow of rainwater in storm sewage and drainage systems.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects
K7_U06	The student selects computational methods depending on the purpose of the task and the characteristics of the analyzed area. Is able to select coefficients and justify their choice and interpret the obtained results.	[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information
K7_U03	The student solves the design task and prepares a report containing a description of the calculations, analysis of the results and conclusions.	[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU5] Assessment of ability to present the results of task [SU3] Assessment of ability to use knowledge gained from the subject
K7_W09	The student has in-depth and structured knowledge of the hydrology of urbanized catchments and the impact of urbanization on water circulation processes.	[SW1] Assessment of factual knowledge

Subject contents

The hydrological cycle in natural and modified environment. Urban catchment and its specificity. Impact of urbanization on the hydrology cycle and quantity of runoff. Definition of rainfall-runoff model. Classifications of hydrological models. Catchment characteristics and their influence on runoff formation. Rainfall as the basic factor determining runoff. IDF formulas. Time of runoff concentration. Global and integrated models for runoff calculations.

<table>
<tr><td>Prerequisites and co-requisites</td><td colspan="3">Recommended prior holding of the course of Hydrology</td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="3"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Project - 2 reports + test</td><td>60.0%</td><td>33.0%</td></tr>
<tr><td>Tutorials - control exercise (test)</td><td>60.0%</td><td>33.0%</td></tr>
<tr><td>Lecture - exam (theory)</td><td>60.0%</td><td>34.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">Akan, A.O., Houghtalen, R.J.: Urban Hydrology, Hydraulics and Stormwater Quality. Engineering Applications and Computer Modeling. John Wiley and Sons, Inc. (2003)</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">1. Highway Hydrology. Publ. of US Department of Transportation (2002)

2. Hydrologic Modeling System HEC-HMS. Technical Reference Manual (2000)

3. Chow, V.T.: Handbook of Applied Hydrology. McGraw Hill Book Company, New York (1964)</td></tr>
<tr><td>eResources addresses</td><td colspan="2">Podstawowe
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=31225 - course on GUT e-learning platform
Adresy na platformie eNauczanie:</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3">Calculate maximal capacity of the analyzed channel.

Calculate with use of rational method the peak value of outflow discharge in urban basin.

Explain the impact of urbanization on particular processes determining stormwater outflow from the catchment.

Explain the concept of 'time of runoff concentration".

Calculate the time of runoff concentration in the analyzed basin.</td></tr>
<tr><td>Work placement</td><td colspan="3">Not applicable</td></tr>
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