



## Subject card

Subject name and code	Hydraulics and Hydrology II, PG_00044310						
Field of study	Civil Engineering						
Date of commencement of studies	October 2023	Academic year of realisation of subject			2023/2024		
Education level	second-cycle studies	Subject group			Obligatory subject group in the field of study		
Mode of study	Part-time studies	Mode of delivery			at the university		
Year of study	1	Language of instruction			Polish		
Semester of study	1	ECTS credits			3.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Hydraulic Engineering -> Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Witold Sterpejkowicz-Wersocki				
	Teachers		dr inż. Witold Sterpejkowicz-Wersocki				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	10.0	0.0	0.0	0.0	25
	E-learning hours included: 0.0						
Adresy na platformie eNauczanie:							
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	25		5.0		45.0	75
Subject objectives	The aim of the course is to acquire and expand knowledge and skills related to the description of hydraulic and hydrological processes.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K7_U10] can analyse complicated environmental loads acting on a construction; can apply proper processes to design marine and hydroengineering constructions taking into consideration hydrological and hydraulic impact	Student is able to choose the appropriate calculation method to solve the problem in the field of surface and underground water hydraulics and hydrology. Performs basic calculations related to hydrology as outflow from the catchment area, flows in rivers including design flows for the purpose of designing damming constructions and the development of hydrological information for other hydrotechnical projects.			[SU2] Assessment of ability to analyse information		
	[K7_W11] has deep knowledge of marine and inland hydrotechnical constructions; has knowledge about hydraulic and hydrological constrains in design and exploitation of buildings	The student has extended knowledge related to the processes taking place in the catchment, flood water retention and flows in rivers in connection with hydrotechnical constructions.			[SW1] Assessment of factual knowledge		
Subject contents	LECTURE Water in the ground and groundwater hydraulics, infiltration. Outflow from the catchment. Effective rainfall and surface runoff, temporary unit hydrogram. Flow in rivers, non-homogeneous and undetermined flow. Transformation of flood waves in rivers. Reservoir retention. Flow curve. States and characteristic flows in rivers. Transport of debris in rivers. Termics and ice phenomena in rivers and lakes.  EXERCISES Calculation of water seepage in the earth dam. Calculation of the outflow from the catchment. Dimensioning of retention reservoirs. Hydraulic dimensioning of the culvert and devices for dissipating water energy below the culvert.						
Prerequisites and co-requisites	Knowledge of subjects: fluid mechanics, hydraulics and hydrology (previous course), mathematics.						

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
		Written colloquium. Duration 45 minutes	60.0%
Recommended reading	Basic literature	<ol style="list-style-type: none"> <li>1. Byczkowski A.: Hydrologia, Tom 1, Tom 2, Wydawnictwo SGGW, Warszawa 1996</li> <li>2. Szymiewicz R., Gąsiorowski D.: Podstawy hydrologii dynamicznej, Wydawnictwo WNT, Warszawa 2016</li> <li>3. Mitosek M.: Mechanika płynów w inżynierii środowiska, Wydawnictwo Naukowe PWN, Warszawa 2001.</li> <li>4. Ozga-Zielińska M., Brzeziński J.: Hydrologia stosowana, Wydawnictwo Naukowe PWN, Warszawa 1994.</li> <li>5. Sawicki J.: "Przepływy ze swobodną powierzchnią", PWN Warszawa 1998.</li> <li>6. Lambor J.: Hydrologia inżynierska, Wydawnictwo ARKADY, Warszawa 1971</li> </ol>	
	Supplementary literature	<ol style="list-style-type: none"> <li>1. Kubrak J.: Hydraulika techniczna, SGGW Warszawa 1998.</li> <li>2. Szymkiewicz R.: Modelowanie matematyczne przepływów w rzekach i kanałach, Wydawnictwo Naukowe PWN Warszawa, 2000.</li> <li>3. Sobota J.: Hydraulika i Hydrologia, Wydawnictwo Uniw. Przyrodniczy we Wrocławiu, Wrocław 2004</li> </ol>	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		