



Subject card

Subject name and code	Hydraulics & Hydrology, PG_00072570						
Field of study	Civil Engineering						
Date of commencement of studies	October 2026		Academic year of realisation of subject			2026/2027	
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	1		Language of instruction			English	
Semester of study	1		ECTS credits			3.0	
Learning profile	general academic profile		Assessment form			assessment	
Conducting unit	Department of Geotechnical and Hydraulic Engineering -> Faculty of Civil and Environmental Engineering -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Tomasz Kolerski				
	Teachers		dr hab. inż. Tomasz Kolerski Parisa Radan				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	15.0	15.0	0.0	0.0	45
	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	45		3.0		27.0	75
Subject objectives	The aim of the subject is to introduce students to the fundamentals of open-channel hydraulics and hydrology, with particular emphasis on rainfall–runoff processes, catchment characteristics, and water resources management. The subject covers basic methods of flow analysis, hydrological calculations, and the operating principles of selected hydraulic structures. It also aims to develop students' skills in performing engineering calculations, conducting laboratory measurements, and interpreting their results.						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	[K7_U02] interprets, in an in-depth way, phenomena and relationships between processes in the construction industry, using modern knowledge in line with the main trends in the development of scientific disciplines related to the field of study		The student interprets hydraulic and hydrological phenomena and their interrelationships, with particular emphasis on open-channel flow, rainfall–runoff processes, and the interaction between water flow and hydraulic structures. Applies current engineering knowledge to analyze and evaluate these processes.			[SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools	
	[K7_W01] identifies in-depth the phenomena related to the field of study and the theories describing them, indicating reliable sources of knowledge and information relevant to the issues analysed		The student identifies and explains hydraulic and hydrological phenomena, particularly those related to open-channel flow, rainfall–runoff processes, and the operation of hydraulic structures. Demonstrates knowledge of the theoretical principles governing these processes and identifies reliable sources of information used in engineering analyses.			[SW1] Assessment of factual knowledge	

Subject contents	Course content – lecture		
	Fundamentals of water resources management in Poland. Open-channel hydraulics: continuity and energy equations, uniform flow, Manning equation, specific energy, critical flow, gradually varied flow, and hydraulic jumps. Fundamentals of hydrology: hydrological cycle, water balance, catchment characteristics, precipitation processes, rainfall measurement and analysis, IDF curves, infiltration, and evapotranspiration. Rainfall–runoff transformation, unit hydrograph, and estimation of design discharges. Fundamentals of hydraulic structures: dams, spillways, reservoirs, and culverts.		
	Course content – exercises		
	Analysis of hydrological data and determination of catchment parameters. Estimation of design rainfall and catchment runoff using selected hydrological methods. Calculation of runoff hydrographs and design discharges. Hydraulic calculations of culverts, including their discharge capacity and flow conditions.		
Prerequisites and co-requisites	Course content – laboratory		
	Discharge measurements in open channels. Determination of flow resistance and roughness coefficients. Flow measurements using a Parshall flume. Hydraulic experiments on culverts and spillways. Investigation of seepage through porous media. Processing and interpretation of laboratory measurements.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Test	60.0%	40.0%
	Laboratory	60.0%	30.0%
	Tutorial assignments	60.0%	30.0%
Recommended reading	Basic literature	Chow V. T., Handbook of Applied Hydrology, 1964 Edition (or later) McGraw Hill, Inc. Department Library (available in place) – open stock	
		Mays L. W., <i>Water Resources Engineering</i> , 2005 Edition (or later) John Wiley & Sons, Inc. Department Library (available in place) – open stock	
	Supplementary literature	Young D. F., Munson B R Okiishi T. H., Huebsch W. W., <i>A Brief Introduction to Fluid Mechanics</i> , John Wiley and Sons, Inc. 2007 (or later edition)	
	eResources addresses		
Example issues/ example questions/ tasks being completed	• Determination of catchment hydrological parameters. • Runoff hydrograph calculation using the unit hydrograph method. • Calculation of culvert conveyance and analysis of hydraulic conditions. • Discharge measurement in an open channel.		
Practical activities within the subject	Not applicable		

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