GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Water Management, PG_00049422		
Field of study	Environmental Engineering		
Date of commencement of studies	October 2020	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	Full-time studies	Mode of delivery	at the university
Year of study	3	Language of instruction	Polish
Semester of study	6	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Faculty of Civil and Environmental Engineering		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Tomasz Kolerski	
	Teachers	mgr inż. Dominika Kalinowska dr hab. inż. Tomasz Kolerski	

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	15.0	0.0	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	5.0	35.0	85

Subject objectives	The course aims to emphasize the advantages of interdisciplinary work and team work aimed at solving problems in the water resources management

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_U03] can prepare documentation regarding the implementation of an engineering task/project and prepare a text or presentation including a discussion of the results of the implementation	The student is able to prepare documentation concerning the determination of the usable capacity of the tank; the student is able to prepare documentation on determining the permanent retention of the reservoir; The student is able to discuss the results of the presented documentation	[SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment
	[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 able to calculate the amount of effective precipitation on the basis of meteorological data and information about the use of the catchment area; the student is able to calculate the runoff from an uncontrolled catchment using the geomorphological hydrograph model.	[SW1] Assessment of factual knowledge
	[K6_U01] has the ability to self-education, can obtain information from literature, databases and other sources, uses information technology, Internet resources; can integrate the obtained information, make their interpretation, as well as draw conclusions and formulate and justify opinions	The student knows how to use Internet resources in the field of meteorological and hydrological databases; is able to use topographic maps to determine the catchment boundary; is able to interpret hydrological maps in order to determine the classification of watercourses; The student is able to draw conclusions from the obtained results of calculations.	[SU2] Assessment of ability to analyse information
	[K6_W04] possesses elementary knowledge in the field of land mechanics, ground science, land reclamation and geotechnics; has basic knowledge about the composition of air, water and soil, environmental pollution and processes responsible for their formation and ways to reduce them, knows the principles and organization of sustainable water management	The student knows the water resources of the globe and Poland in relation to rainwater and surface water resources; Knows the rules of water retention and small retention systems; knows the characteristics of the tank regime and the division of the tank capacity, can define and describe the characteristic and guaranteed flows; is able to classify water management plans in a reservoir under normal conditions and water deficits and during floods; knows the principles of operation of dry retention reservoirs; knows technical and non-technical measures in flood protection; knows the role of dikes in flood protection; can classify drought as a hydrological phenomenon	[SW1] Assessment of factual knowledge
	[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 knows the basics of the geomorphological hydrograph model which can be used to solve the practical problem of calculating the runoff from an uncontrolled catchment; the student knows the basics of the equidistant method for determining the usable capacity of a tank; the student knows the submissions of water management plans in a reservoir during a flood and is able to use them to calculate the permanent reserve of the reservoir	[SW1] Assessment of factual knowledge

Subject contents	The course is designed to familiarize students with the theory and practice of planning and managing water resources. As part of the course, students learn about the water resources of the Earth and Poland in relation to rainwater and surface water resources; Students learn the principles of water retention as well as the methods of operation and the role of small retention systems. The student learns the characteristics of the tank regime and the division of the tank capacity as well as is able to define and describe the characteristic and guaranteed flows. As part of the course, the student acquires knowledge about water management plans in a reservoir under normal conditions and water deficits as well as during floods; knows the principles of operation of dry retention reservoirs; knows technical and non-technical measures in flood protection; knows the role of dikes in flood protection; can classify drought as a hydrological phenomenon.
Prerequisites and co-requisites	Hydraulics, hydrology, fluid mechanics

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Final test	60.0%	70.0%
Reports	60.0%	30.0%

Recommended reading

Basic literature	Lambor L. (1962), *Gospodarka wodna na zbiornikach retencyjnych* Arkady Dziewoński Z. (1973) *Rolnicze zbiorniki retencyjne* Warszawa Ciepielowski A. (1999) *Podstawy gospodarowania wodą* SGGW Kolerski T. (2014) Praktyczne aspekty gospodarki wodnej w projektowaniu zbiorników retencyjnych
Supplementary literature	1. Cech, T., V., Principles of Water Resources, John Wiley & Sons, Inc. 2002 2. Chow, V.T., Open-channel Hydraulics, McGraw-Hill, 1959 3. Dzurik, A., A., Water Resources Planning (3rd ed), Rowman & Littlefield Pub. Inc., 2003
eResources addresses	Podstawowe https://www.researchgate.net/publication/263043106_Praktyczne_aspekty_gospodarki_wodnej_w_projektowaniu - Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	• Determination of the usable capacity of the tank • Determination of the permanent retention of a reservoir • Calculation of the geomorphological hydrograph
Work placement	Not applicable