

COURSE DESCRIPTION CARD

Faculty of Civil Engineering and Environmental Science									
Field of study	Environmental Engineering							Degree level and programme type	Bachelor's degree
Specialization/ diploma path	International School of Engineering							Study profile	Academic profile
Course name	Water management and protection							Course code	19284214H/IS1S41030
								Course type	Obligatory
Forms and number of hours of tuition	L	C	LC	P	SW	FW	S	Semester	VI
	1	-	-	1	2	-	-	No. of ECTS credits	5
Entry requirements	Basic knowledge of mathematics, chemistry and hydrology, basic knowledge of information technologies								
Course objectives	The aim of the course is to provide students knowledge about principles of water management and protection, including information on hydrological phenomena and processes, methods of water quality assessment and possibilities of water protection. Practical outcome of the course is ability to perform engineering calculations applied in water protection projects.								
Course content	<p>LECTURES: Water resources and water demand; Hydrologic cycle: water balance, characteristic of hydrologic cycle components and processes; Sources of water pollution; River water quality: processes in rivers, water quality zones; Lakes water quality: physical limnology, biological and chemical characteristics; Groundwater quality: groundwater zones, contaminant transport; Management practices for water protection</p> <p>PROJECT: Engineering calculations used in water protection projects including water quality classification, spread of pollutants in water, time of pollutant migration to watercourses and water reservoirs, release of pollutants into waters</p> <p>SPECIALIZATION WORKSHOP: Influence of wastewater on the quality of surface waters: computer model development, simulations.</p>								
Teaching methods	case study analysis, discussion, technical calculations, teacher-centered instruction, project-based learning								
Assessment method	correctness of engineering calculations, written test								
Symbol of learning outcome	Learning outcomes							Reference to the learning outcomes for the field of study	
LO1	Knowledge concerning water management and protection including water resources, water quality and water protection							IS1_W01	
LO2	Knowledge of processes and phenomena occurring in water environment and during hydrological cycle							IS1_W07	
LO3	Knowledge of possibilities and methods of assessing environmental impact on water quality							IS1_W11	

LO4	Is able to plan proper calculation for water management/protection, interpret the results and draw conclusions on their basis	IS1_U02
LO5	Can select and use computer tools to solve complex engineering computational tasks	IS1_U05
LO6	Can use the different kinds of information related to water management and protection	IS1_U14
LO7	Is ready to carry out duties during the specialization workshop and project tasks, taking into consideration the social conditions	IS1_K05
Symbol of learning outcome	Methods of assessing the learning outcomes	Type of tuition during which the outcome is assessed
LO1	written test	L
LO2	written test, engineering calculation	L, P, SW
LO3	written test, engineering calculations	L, P
LO4	interpretation of research results	SW, P
LO5	engineering calculations, evaluation of the correctness of algorithms	SW, P
LO6	engineering calculations	SW, P
LO7	written test, engineering calculations, activity during project	L, SW, P
Student workload (in hours)		No. of hours
Calculation	participation in lectures	16
	participation in project and specialization workshop	48
	preparation for written test (lecture)	8
	preparation of project calculations	32
	preparation for specialization workshop	40
	participation in student-teacher sessions related to the project/lectures	5
	TOTAL:	125
Quantitative indicators		HOURS
Student workload – activities that require direct teacher participation		69
Student workload – practical activities		5
Basic references	1. Pennington K.L., Cech T.V. Introduction to water resources and Environmental Issues. Cambridge University Press, 2015 2. Clausen John C. Introduction to Water resources. Waveland Press, Inc, 2018 3. Sudha Goel. Water and wastewater Engineering. Cambridge University Press, 2019	
Supplementary references	Hadrian F. Cook. The Protection and Conservation of Water Resources, Second Edition. John Wiley & Sons Ltd. 2017 ISBN:9781119970040	
Organisational unit conducting the course	Department of Water Supply and Sewage Systems	Date of issuing the programme
Author of the programme	dr hab. inż. Izabela Anna Tałała, prof. PB dr inż. Paweł Biedka	May 2022

L – lecture, C – classes, LC – laboratory classes, P – project, SW – specialization workshop, FW - field work,

S – seminar