COURSE DESCRIPTION CARD

<table>
<tr><td colspan="10">Faculty of Civil Engineering and Environmental Sciences</td></tr>
<tr><td>Field of study</td><td colspan="6">Environmental Engineering</td><td colspan="2">Degree level and programme type</td><td>Master's degree</td></tr>
<tr><td>Specialization/ diploma path</td><td colspan="6">International School of Engineering</td><td colspan="2">Study profile</td><td>academic profile</td></tr>
<tr><td rowspan="2">Course name</td><td colspan="6" rowspan="2">Selected Problems of Water Supply and Sewage Systems</td><td colspan="2">Course code</td><td>19284255H</td></tr>
<tr><td colspan="2">Course type</td><td>obligatory</td></tr>
<tr><td rowspan="2">Forms and number of hours of tuition</td><td>L</td><td>C</td><td>LC</td><td>P</td><td>SW</td><td>FW</td><td>S</td><td>Semester</td><td>winter</td></tr>
<tr><td>16</td><td></td><td></td><td>32</td><td>16</td><td></td><td></td><td>No. of ECTS credits</td><td>5</td></tr>
<tr><td>Entry requirements</td><td colspan="9">Basic knowledge of water supply and sewage systems</td></tr>
<tr><td>Course objectives</td><td colspan="9">Students will learn engineering principles of multi-zone water supply systems and alternative sewer systems operation and design. By the end of this module students should be able to estimate required technical parameters and design specific elements of the systems.</td></tr>
<tr><td>Course content</td><td colspan="9"><u>Lectures</u>: Multi-zone water supply systems. Technical and economical aspects of pressure regulation in water distribution network. Technical solutions and hydraulic calculations of multipipe transmission mains. Alternative sewer and drainage systems.
<u>Project -</u>: design of multipipe transmission main with hydraulic calculations and the placement of required appurtenances; design of the layout and hydraulic calculations of drainage system, conceptual design of rainwater percolation system
<u>Specialized workshop</u> – application of professional computer software for design and hydraulic analysis of water supply, sewer and drainage systems.</td></tr>
<tr><td>Teaching methods</td><td colspan="9">Informational lectures (with multimedia presentations), design project (with example calculations)</td></tr>
<tr><td>Assessment method</td><td colspan="9">lecture – written test; project / specialized workshop – project / exercises completion, presentation and discussion</td></tr>
<tr><td>Symbol of learning outcome</td><td colspan="8">Learning outcomes</td><td>Reference to the learning outcomes for the field of study</td></tr>
<tr><td>LO1</td><td colspan="8">Student knows and is able to describe specific solutions of water distribution, sewerage and drainage systems</td><td>IS2_W06</td></tr>
<tr><td>LO2</td><td colspan="8">Student is able to design a complex water supply network and sewage disposal system</td><td>IS2_U09</td></tr>
<tr><td>LO3</td><td colspan="8">Student is able to access and apply data necessary for a design and analysis of water supply and sewer/drainage</td><td>IS2_U08</td></tr>
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	systems	
LO4	Student is ready to analyse problems related to water supply and sewage disposal	IS2_K01
LO5		
Symbol of learning outcome	Methods of assessing the learning outcomes	Type of tuition during which the outcome is assessed
LO1	written exam	L
LO2	evaluation of submitted project and exercises from the workshop	P, SW
LO3	evaluation of submitted project / exercises	P, SW
LO4	discussion of submitted project	P
LO5		
Student workload (in hours)		No. of hours
Calculation	lecture attendance	16
	participation in classes, laboratory classes, etc.	48
	working on projects, reports, etc.	40
	participation in student-teacher sessions related to the classes/seminar/project	6
	preparation for and participation in exam	15
	TOTAL:	125

Quantitative indicators	HOURS	No. of ECTS credits
Student workload – activities that require direct teacher participation	70	2,8
Student workload – practical activities	88	3,5

Basic references	1. P.N. Modi: Water Supply Engineering Volume - 1 (ISBN-13: 9788189401351), 2018, STANDARD BOOK HOUSE 2. . Butler, D., Davies J.W.: Urban Drainage, 2nd edition, Spon Press, London And New York, 2000 3. Rossman, L., H. Woo, M. Tryby, F. Shang, R. Janke, AND T. Haxton. EPANET 2.2 User Manual. U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-20/133, 2020. 4. Rossman, L.A., 2009. Storm Water Management Model User's Manual Version 5.0. EPA/600/R-05/040, National Risk Management Research Laboratory. United States Environmental Protection Agency, Cincinnati, Ohio.
Supplementary references	1. Rossman, L., W. Huber. Storm Water Management Model Reference Manual Volume I, Hydrology. U.S. EPA Office of Research and Development, Washington, DC, EPA/600/R-15/162A, 2015

Organisational unit conducting the course	Department of Water Supply and Sewage Systems	Date of issuing the programme
Author of the programme	Dariusz Andraka, PhD	2023.01.12

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