

## COURSE DESCRIPTION CARD – SPECIMEN

Faculty of Civil Engineering and Environmental Sciences									
Field of study								Degree level and programme type	
Specialization/ diploma path								Study profile	Academic profile
Course name	Facilities for water and wastewater treatment II							Course code	IS-FCEE-00040W
								Course type	Erasmus
Forms and number of hours of tuition	L	C	LC	P	SW	FW	S	Semester	Winter
	30	-	-	30	-	-	-	No. of ECTS credits	6
Entry requirements	Basic knowledge of: chemistry, ecology, biology, biotechnology								
Course objectives	Types of facilities for wastewater treatment, systems, their elements and technology. Calculations of pollution loads, the efficiency of contaminants removal. Knowledge about types of treatment technologies, their advantages and disadvantages, types of wastewater linked to particular parameters. Identification of pollution parameters, analytical methods.								
Course content	<p><b>Lecture:</b> Types, characteristics, technological parameters, application in real conditions of unit processes, methods and devices used for wastewater treatment technology. Wastewater characteristics. Legal regulations related to sewage management. Transformations of pollutants occurring in sewage, in aerobic and anaerobic conditions. Methods of sewage treatment. Technical and technological solutions. Systems for integrated removal of organic compounds, nitrogen and phosphorus. Devices for pre-treatment of selected types of wastewater. Systems of wastewater treatment facilities and equipment.</p> <p><b>Project:</b> Practical implementation of the lectures in the form of a project covering the issues of wastewater technology. The calculation of pollution loads, the efficiency of removal.</p>								
Teaching methods	Multimedia presentation (lecture), design of WWTP system (project)								
Assessment method	lecture – written or oral exam; project – implementation of the project, presentation and discussion								
Symbol of learning outcome	Learning outcomes							Reference to the learning outcomes for the field of study	
LO1	Student has knowledge of basic science, including chemistry and biology, essential to understanding the processes occurring in the environment or processes generated in connection with activities in the field of environment							ISCED_W01	

L02	Student has an elementary knowledge of the materials used in wastewater treatment (facilities)	ISCED_W07	
L03	Student has a basic knowledge of the current situation and the latest development trends in environmental engineering. Student knows standards, specific rules and law connected with calculations of wastewater technology.	ISCED_W18	
L04	Student is able to obtain information from the literature and databases about different types of facilities for wastewater treatment, instalations etc. Student can compare knowledge from different sources, interpret data, make conclusions, formulate and justify own opinions.	ISCED_U18	
L05	Student is able to formulate systems and technological systems used in environmental engineering	ISCED_U21	
L06	Student is responsible for own work and can work in a team during study, takes responsibility for collaborative research.	ISCED_K02	
<b>Symbol of learning outcome</b>	<b>Methods of assessing the learning outcomes</b>	<b>Type of tuition during which the outcome is assessed</b>	
L01	evaluating the student's reports, exam, design presentation	L, P	
L02	design form	P	
L03	exam, design form and presentation	L, P	
L04	evaluating the student's work during project	P	
L05	discussion of the student's design	P	
L06	evaluating the student's work during project	P	
<b>Student workload (in hours)</b>		<b>No. of hours</b>	
<b>Calculation</b>	lecture attendance	30	
	participation in classes	45	
	preparation for classes, projects, seminars, etc.	30	
	working on projects, etc.	25	
	participation in student-teacher sessions related to the classes/seminar/project	5	
	implementation of project tasks	10	
	preparation for and participation in exams/tests	10	
	<b>TOTAL:</b>		<b>155</b>
<b>Quantitative indicators</b>		<b>HOURS</b>	<b>No. of ECTS credits</b>
<b>Student workload – activities that require direct teacher participation</b>		80	3
<b>Student workload – practical activities</b>		80	3
<b>Basic references</b>	Ray, Chittaranjan, Jain, Ravi Drinking Water Treatment Wastewater, Springer 2011, James McGraw-Hill 2011, Engineering- treatment,disposal, reuse. Metcalf&Eddy-Mc-Graw Hill, 2003		
<b>Supplementary references</b>	Wastewater and biosolids treatment technologies, Pollution Engineering 2001		
<b>Organisational unit conducting the course</b>	Department of Environmental Engineering Technology	<b>Date of issuing the programme</b>	

<b>Author of the programme</b>	<b>Joanna Struk-Sokolowska, PhD</b>	<b>09.03.2021</b>
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L – lecture, C – classes, LC – laboratory classes, P – project, SW – specialization workshop, FW - field work,

S – seminar