

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	Water and wastewater technology II							Course code	IS-FCEE-00030W
								Course type	Erasmus
Forms and number of hours of tuition	L	C	LC	P	SW	FW	S	Semester	Winter
	30	-	30	15	-	-	-	No. of ECTS credits	5
Entry requirements	Basic knowledge of: biology, biotechnology, chemistry, ecology								
Course objectives	Types of advanced technologies for wastewater treatment, systems and their mechanical, biological elements, etc. Municipal and industrial wastewater characteristic. Calculations of pollution loads, the efficiency of contaminants removal. Knowledge about types of treatment technologies, their differences, advantages and disadvantages. Identification of pollution parameters, analytical methods. Legal requirements for treated wastewater discharged into the environment (rivers, land).								
Course content	<p>Lecture: Wastewater characteristic. Types, characteristics, technological parameters, application in real conditions of unit processes, methods and devices used for wastewater treatment technology. Legal regulations related to sewage management. Transformations of pollutants occurring in sewage, in aerobic and anaerobic conditions. Methods and technologies 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>Laboratory classes: Conducting research to identify contaminants in wastewater. Analytical methods used to characterise qualitatively and quantitatively pollutants in wastewater. Comparison of the effectiveness of different wastewater treatment technologies in removing organic and biogenic pollutants.</p> <p>Project: 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), conducting research to identify contaminants in wastewater (laboratory classes), design of WWTP (project)								
Assessment method	lecture – written or oral exam; laboratory classes – report on research carried out, project – implementation of the project, presentation and discussion								

Symbol of learning outcome	Learning outcomes	Reference to the learning outcomes for the field of study	
L01	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 technologies and systems (materials) used in wastewater treatment	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 wastewater treatment technology.	ISCED_W18	
L04	Student is able to obtain information from the literature and databases about different types of wastewater, technologies of treatment, WWTP installations 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 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	
Symbol of learning outcome	Methods of assessing the learning outcomes	Type of tuition during which the outcome is assessed	
L01	evaluating the student's reports, exam, design presentation	L, LC, P	
L02	exam, report, design presentation	L, LC, P	
L03	exam, design form and presentation	L, LC, P	
L04	evaluating the student's work during preparing report and project	LC, P	
L05	discussion of the student's design	P	
L06	evaluating the student's work during conducting research and preparing project	LC, P	
Student workload (in hours)		No. of hours	
Calculation	lecture attendance	30	
	participation in classes	75	
	preparation for laboratory classes, project	5	
	working on projects, etc.	10	
	participation in student-teacher sessions related to the classes/seminar/project	5	
	implementation of project tasks	5	
	preparation for and participation in exams/tests	5	
	TOTAL:	135	
Quantitative indicators		HOURS	No. of ECTS credits
Student workload – activities that require direct teacher participation		75	3
Student workload – practical activities		55	2

Basic references	Ray, Chittaranjan, Jain, Ravi Drinking Water Treatment Wastewater, Springer 2011, James McGraw-Hill 2011, Engineering- treatment,disposal, reuse. Metcalf&Eddy-Mc-Graw Hill, 2003	
Supplementary references	Wastewater and biosolids treatment technologies, Pollution Engineering 2001	
Organisational unit conducting the course	Department of Environmental Engineering Technology	Date of issuing the programme
Author of the programme	Joanna Struk-Sokolowska, PhD	09.03.2021

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

S – seminar