

COURSE DESCRIPTION CARD

Faculty of Civil and Environmental Science									
Field of study								Degree level and programme type	
Specialization/ diploma path								Study profile	Academic profile
Course name	Facilities for water and wastewater treatment I							Course code	IS-FCEE-00029W
								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	Water technology								
Course objectives	<p>Water purification devices used for drinking, domestic and industrial water. Required technological parameters of the discussed devices and their effectiveness in water treatment. Types, principles of operation and parameters of water treatment devices.</p> <p>Principles of equipment selection depending on the type of treated water, its quality, demand and purpose. Systematization of the acquired knowledge, skills and competences. project and design of water treatment stations for household and technological water.</p>								
Course content	<p>Lecture: Discussion of basic systems of domestic water treatment plants and technological water treatment. Transfer of knowledge in the field of basic methods of source water purification i.e. ground water, surface water and infiltration water. Presentation of knowledge in the field of devices for mechanical, chemical, physico-chemical. and physical treatment of drinking, domestic and process water: straining, sedimentation coagulation, filtration, de- and de-ionization, sorption, disinfection, softening, deoxygenation. Discussion of sludge management at the water treatment station.</p> <p>Project: Types, operating characteristics, technological parameters, and application of devices used for water treatment in real conditions of water treatment. Examples of technological and design solutions of water treatment stations for drinking and household purposes.</p>								
Teaching methods	Lecture – presentation, discussion with students, case study explanation, project – calculation and design of water treatment stations								
Assessment method	Lecture – final exam, project – projects and design issues								

Symbol of learning outcome	Learning outcomes	Reference to the learning outcomes for the field of study
LO1	Student has knowledge to an advanced degree in the field of basic methods of physico-chemical analyses, processes and phenomena occurring in water and the latest methods of water treatment	IS1_W07 IS1_W06
LO2	Student knows in advanced degree - principles of designing technology, systems in environmental engineering, as well as principles of operation and use of equipment. He/she can use scientific, popular science and industry literature, subject matter The student is able to use scientific, popular and branch literature, norms, legal acts, internet databases. He/she uses acquired information appropriately, draws conclusions and formulates and presents opinions, evaluates different opinions and discusses them.	IS1_W09
LO3	The student is able to design solutions of devices, systems, objects in environmental engineering using appropriately selected methods, techniques, tools and materials. The student is able to design and implement their own innovative technical and technological solutions of devices, objects and systems in environmental engineering. The student is able to act creatively and entrepreneurially, to cooperate in a group taking various roles	IS1_U12 IS1_U13
LO4	Students is able to analyse and evaluate technical, technological and organisational solutions concerning of arising pollution, is able to act in a creative and entrepreneurial way cooperate in a group, taking various roles in it.	IS1_U08
LO5	The student is ready to analyze the content obtained from sources and to critically evaluate the possibility of use them in professional work	IS1_K01
Symbol of learning outcome	Methods of assessing the learning outcomes	Type of tuition during which the outcome is assessed
LO1	Exam	L
LO2	Exam, project and design	L, P
LO3	Exam, project and design	L,P
LO4	Exam, project and design	L, P
LO5	Exam, project and design	L,P
Student workload (in hours)		No. of hours
Calculation	Attendance at lectures	15
	Attendance at project	30

	Preparation for exam	10	
	Preparation for project and design	15	
	Preparation for home work	30	
	Project defence	5	
	Consultations with teacher	10	
	TOTAL:	115	
	Quantitative indicators	HOURS	No. of ECTS credits
	Student workload – activities that require direct teacher participation	60	2,5
	Student workload – practical activities	80	3
Basic references	<ol style="list-style-type: none"> 1. Binnie C., Kimber M., Smethurst G. (2002) Basic Water Treatment, Londyn Thomas Telford Ltd. 2. Carter M.R., Gregorich E.G. Soil sampling and methods of analysis, II edition, Taylor & Francis Publ. NW 2008 3. Cheremisinoff P. (2002). Handbook of Water and Wastewater Treatment Technologies. Butterworth-Heinemann. 		
Supplementary references	<ol style="list-style-type: none"> 1. Beverly P (2005). Filter Troubleshooting and Design Handbook. American Water Works Association 2. Crittenden J.C., Rhodes Trussell R., Hand D.W., Howe K.J., Tchobanoglous G. (2005) Water treatment: Principles and design, 2nd edition, John Wiley & Sons, Inc. 3. Frayne C. (2011) The metro handbook of water treatment for HVAC systems, The metro group. Servicing water systems with environmental care, NY USA 		
Organisational unit conducting the course	Department of Technology in Environmental Engineering	Date of issuing the programme	
Author of the programme	Professor Iwona Skoczko	2021.03.15	

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

S – seminar