

COURSE DESCRIPTION CARD

Faculty of Civil Engineering and Environmental Sciences									
Field of study								Degree level and programme type	
Specialization/ diploma path								Study profile	Academic profile
Course name	Municipal and industrial wastewater treatment							Course code	IS-FCEE-00039S
								Course type	Erasmus
Forms and number of hours of tuition	L	C	LC	P	SW	FW	S	Semester	summer
	15			30				No. of ECTS credits	4
Entry requirements	Water and wastewater technology, Facilities for water and wastewater treatment								
Course objectives	To familiarize the student with the characteristics of industrial wastewater treatment systems and the impact of industrial wastewater on the process of wastewater treatment in municipal wastewater treatment plants. To acquaint the student with the characteristics of sewage in selected industries. Teach the student to choose the technology of equipment for industrial wastewater treatment or sub-treatment with consideration of the Best Available Technique (BAT). To familiarize the student with the operation of selected industrial wastewater treatment systems.								
Course content	<p>The lecture: Characteristics of sewage from selected industries, place of origin and unit indicators. Legal aspects related to the discharge of industrial sewage into the receiver and the municipal sewage system. Characteristics and selection of technologies and rules for sub-treatment plants and industrial sewage treatment plants. Correct operation, monitoring and case analysis.</p> <p>Project: Principles of designing a system for the treatment of industrial wastewater and its pre-treatment before it is discharged to a municipal treatment plant. The best available technology (BAT) in the treatment of wastewater from various industries.</p>								
Teaching methods	Lectures, projects, analysis of actual facilities, case studies								
Assessment method	A written exam is a form of lecture credit. The condition for passing the exam is obtaining at least 50% of points. The form of passing the project is the presentation of the result of the project. The condition for passing the project is active participation in classes in which the student presents the concept and stages of its implementation.								
Symbol of learning outcome	Learning outcomes							Reference to the learning outcomes for the field of study	

LO1	The graduate has knowledge and identifies the processes occurring during the treatment of industrial wastewater	IS2_W01
LO2	A graduate knows the construction, functioning and operation of modern facilities and equipment in sewage treatment technology.	IS2_W02
LO3	The graduate knows the latest methods of managing by-products of industrial wastewater treatment	IS2_W04
LO4	The graduate knows the latest developments and technologies in environmental engineering	IS2_W06
LO5	Graduates can use their knowledge for critical analysis, synthesis, creative interpretation and presentation of environmental engineering issues.	IS2_U02
LO6	Graduates can properly select data in order to design systems and technologies in environmental engineering, use scientific, popular science and industry literature, subject standards, legal acts and internet databases.	IS2_U08
Symbol of learning outcome	Methods of assessing the learning outcomes	Type of tuition during which the outcome is assessed
LO1	Examination for the lecture, execution and defence of the project	L
LO2	Discussion of the project, execution and defence of the project	P
LO3	Lecture completion exam, discussion of the project	L,P
LO4	Passing test of the lecture	L
LO5	Execution and defence of the project, observation of the student in class	P
LO6	Execution and defence of the project, observation of the student in class	L,P
Student workload (in hours)		No. of hours
Calculation	Participation in lectures	15
	Participation in: auditory exercises + laboratory + design classes + specialist laboratory	30
	Participation in consultations related to the exercise/seminar/project	5
	Implementation of project tasks (including preparation of presentations)	45
	Preparation for and attendance at the examination/sitting	20
	Preparation for the project credit	10
	TOTAL:	125
Quantitative indicators		HOURS No. of ECTS

		credits
Student workload – activities that require direct teacher participation		50
Student workload – practical activities		110
Basic references	Industrial Wastewater Treatment, Recycling and Reuse, V. Bhandari, 2014 Wastewater Engineering- treatment, disposal, reuse. Metcalf&Eddy-Mc-Graw Hill, 2003 Joseph D. Edwards; Industrial wastewater treatment: A guidbook, CRC press, 1995	
Supplementary references	Constructed Wetlands for Industrial Wastewater Treatment, <u>Alexandros I. Stefanakis (Editor)</u> , 2018 Industrial Waste Treatment Handbook 2nd Edition, Woodard & Curran, Inc., Butterworth-Heinemann, ISBN: 9781493303199 Innovative Technologies for the Treatment of Industrial Wastewater: A Sustainable Approach 1st Edition, Shirish H. Sonawane, Y. Pydi Setty, T. Bala Narsaiah, S. Srinu Naik, ISBN 9781771884976 -CAT# N11804	
Organisational unit conducting the course	Department of Environmental Engineering Technology	Date of issuing the programme
Author of the programme	Assoc. Prof. Wojciech Dąbrowski, DSc, PhD, Eng.	

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

S – seminar