

Course title: Wastewater technology Technologia ścieków		
Programme: Environmental engineering		Code: 0712
Type of course:	Course level: 1-BSc	Semester:
Form of classes: Lecture, laboratory	Number of hours per week/meeting: 30L, 30Lab	Credit points: 7 ECTS
Education profile: general academic		Course language: English
Enrolment:		

SYLLABUS

I. COURSE CHART

COURSE OBJECTIVES

- C.1.** To acquire knowledge on wastewater and wastewater treatment processes
- C.2.** To learn the basics of chemistry and microbiology of wastewater treatment
- C.3.** Presentation of the way of conducting chemical experiments, data collecting, calculation of final results and formulating conclusions from experimental work in English

PRELIMINARY COURSE REQUIREMENTS FOR KNOWLEDGE, SKILLS AND OTHER COMPETENCES

- 1.** Student knows principal rules and laws in mathematics, chemistry and biology
- 2.** Student is able to logical thinking and estimation of the quality of results obtained during calculation

LEARNING OUTCOMES

- EU 1 -** student understands the wastewater treatment process
- EU 2 -** students recognize how their actions influence the performance of wastewater treatment plant
- EU 3 -** student has the ability to safely conduct laboratory experiments on wastewater treatment based on the instructions, description of the experiment carried out, perform appropriate calculations of technological parameters

COURSE CONTENT

Form of classes - lectures	Hours
Historical background of wastewater treatment. Municipal and industrial	2
Sewage collection systems.	2
Legislation.	2
Overview of wastewater treatment methods.	2
Mechanical wastewater treatment.	2
Microbiological processes of wastewater treatment. Aerobic vs. anaerobic	2
Biological wastewater treatment - attached growth processes. Technical parameters.	2
Biological wastewater treatment - activated sludge. Technical parameters.	2
Biological nutrient removal.	4
How to control wastewater treatment plants - introduction.	3
Waste management in wastewater treatment plants. Sewage sludge	2
Small wastewater treatment plants.	2
Advanced methods of wastewater treatment.	2
Final test	1
Form of classes - laboratory	Hours
Lab safety training.	1
Analysis of selected parameters of wastewater.	3
Treatment of wastewater with trickling filters. Technical parameters.	5
Precipitation of phosphorus.	5
Treatment of wastewater with activated sludge. Technical parameters.	5
Biological nutrient removal with activated sludge method.	5
Visit to a municipal wastewater treatment plant.	6

COURSE STUDY METHODS

1. blackboard, interactive whiteboard
2. multimedia presentation
3. laboratory manuals
3. Laboratory installations of selected wastewater treatment technologies

METHODS OF ASSESMENT (F - formative; S - summative)

F1. – activity in classes
F2. – evaluation of the team work in the laboratory classes
F3, - initial tests before laboratory
F4. – evaluation of the laboratory reports
S1. – final test lecture

STUDENT WORKLOAD

Form of activity	Workload (hours)
Participation in lectures	29 h
Participation in classes	- h
Laboratory	30 h

Participation in project classes	- h
Participation in seminar	- h
Preparation course on e-learning	- h
Test	1- h
Entrance test for laboratory classes	- h
Project's defence	- h
Exam	- h
Consultation hours	20- h
DIRECT TEACHING, hours/ ECTS	80 h / 3,2 ECTS
Preparation for tutorials	30- h
Preparation for laboratories	30 h
Preparation for projects	- h
Preparation for seminars	- h
Preparation for e-learning classes	- h
Participation in e-learning classes	- h
Working on project	- h
Preparation for tests	35 h
Preparation for exam	- h
SELF-STUDY, hours/ ECTS	95h / 3,8 ECTS
TOTAL (hours)	Σ 175. h
TOTAL ECTS	7 ECTS

PRIMARY AND SUPPLEMENTARY TEXTBOOKS

Grady L., et al., Biological Wastewater treatment, CRC Press, 2011 or later edition

SUBJECT COORDINATOR (NAME, SURNAME, E-MAIL ADDRESS)

1. dr hab. inż. Ewa Wiśniowska, prof. PCz, ewa.wisniowska@pcz.pl

NAME OF LECTURER (s) (NAME, SURNAME, E-MAIL ADDRESS)

1. dr hab. inż. Ewa Wiśniowska, prof. PCz, ewa.wisniowska@pcz.pl

Learning outcome	In relation to the learning outcomes specified for the field of study	Course objectives	Course content	Course study methods	Methods of assesment
EU1					
EU2					
EU3					

II. OTHER USEFUL INFORMATION

1. All the information on the class schedule is posted on the student information board and online at: www.is.pcz.pl
2. The information about the consultation hours is provided to students on the first class meeting and posted online at the Faculty of Infrastructure and Environment Website
3. The information on course completion and grade is provided to students on the first class meeting.