COURSE DESCRIPTION CARD - SYLLABUS

Course name
Engineering of environmental protection processes

Course

Field of study
Chemical and process engineering

Year/Semester
1/2

Area of study (specialization)
Chemical engineering

Profile of study
general academic

Level of study
Second-cycle studies

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
30

Laboratory classes

Other (e.g. online)

Tutorials

Projects/seminars

Number of credit points

2

Lecturers

Responsible for the course/lecturer:
Marek Ochowiak Eng, PhD, DSc

Responsible for the course/lecturer:

Prerequisites

As preliminary requirements the student should have basic knowledge of chemical engineering, environmental engineering, automation and industrial surveying as well as the design and operation principles of process apparatus.

Course objective

The student is acquainted with selected environmental protection processes. Particular attention is paid to devices for water and wastewater treatment important from the point of view of environmental engineering.

Course-related learning outcomes

Knowledge

1. Has the knowledge needed to formulate and solve apparatus computational tasks for selected environmental protection processes. K_W1, K_W2, K_W3

2. Has knowledge of complex chemical processes, including the appropriate selection of materials, raw materials, apparatus and equipment for the implementation of chemical processes in environmental protection. K_W4

3. Knows environmental protection problems related to the implementation of industrial chemical processes. K_W9

Skills

1. Uses the indicated sources of knowledge appropriately and acquire knowledge from other literature sources. K_U1

2. Is able to independently determine the directions of further education and search for the appropriate topic to develop.K_U5

3. Is able to verify modern concepts of engineering solutions in relation to the current state of knowledge.K_U10

Social competences

1. Has formed awareness of the limitations of science and technology related to environmental protection. K_K2

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Multimedia presentation/test

Programme content

The following subjects are discussed:

• Methods to prevent atmospheric, water and soil pollution, both through measures to minimize production of pollutants and their removal.

• Analysis and design principles for the purification of exhaust and waste gases, liquids and emulsions, industrial and domestic sewage, absorption and spraying as well as spraying apparatus.

• Issues of process and apparatus exploitation in industry.

• Mechanical, physical, chemical, electrical treatment, etc. as well as standards of installation systems with particular emphasis on environmental protection aspects.

Teaching methods

Multimedia presentation, didactic trips

Bibliography

Basic

1. Ochowiak M., Broniarz-Press L.: Inżynieria procesów ochrony środowiska, Wyd. Politechnikii Poznańskiej, Poznań, 2012.

2. Gawroński R.: Procesy oczyszczania cieczy, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa, 1999.

3. Zarzycki R.: Wymiana ciepła i ruch masy w inżynierii środowiska, WNT, Warszawa, 2005.

4. Orzechowski Z., Prywer J.: Wytwarzanie i zastosowanie rozpylonej cieczy, Wydawnictwa Naukowo-Techniczne, Warszawa 2008.

Additional

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2
Classes requiring direct contact with the teacher	35	1.5
Student's own work (literature studies, preparation for test or presentation preparation, trips) [1]	15	0,5

[1] delete or add other activities as appropriate