



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Purification processes

Course

Field of study

Chemical and process engineering

Area of study (specialization)

Chemical engineering

Level of study

Second-cycle studies

Form of study

full-time

Year/Semester

1/1

Profile of study

general academic

Course offered in

Polish

Requirements

compulsory

Number of hours

Lecture

Laboratory classes

Other (e.g. online)

45

Tutorials

Projects/seminars

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

Marek Ochowiak Eng, PhD, DSc

Responsible for the course/lecturer:

Jacek Różański Eng, PhD, DSc

Prerequisites

As preliminary requirements the student should have a basic knowledge of the kinetics of heat and mass transfer processes, construction and operating principles of process apparatus, mathematical analysis and process control.

Course objective

The aim of the course is to acquaint the student with the practical course of diffusion-thermal and mechanical processes for the purification of gases, liquids and solids that occur in both the chemical industry and environmental protection. The subject is mainly focused on expanding practical skills.

Course-related learning outcomes

Knowledge

1. Has extended knowledge of diffusion-thermal and mechanical processes for the purification of gases, liquids and solids important from the point of view of chemical engineering and environmental protection. K_W4, K_W9



Skills

1. Is able to plan the process of separating mixtures and carry it out based on previously performed theoretical calculations. K_U9, K_U19
2. Is able to choose the appropriate conditions for conducting the process in order to achieve the desired efficiency of mixture separation. K_U19
3. On the basis of the analysis of pollutant type and concentration, he is able to correctly select the apparatus for gas/liquid stream purification. K_U18
4. Is able to perform and utilize computer image analysis to determine the shape and size of solid particles. K_U7
5. Has teamwork skills and is aware of the security principles. K_U15
6. Has the ability to present research results in the form of a report. K_U6
7. Is able to critically evaluate the results of experimental research. K_U18

Social competences

1. Is aware of the responsibility for teamwork and taking responsibility for it. K_K5
2. 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:

Test, report on laboratory exercises, oral and written answers

Programme content

The laboratory includes the following processes:

- simple distillation,
- periodic rectification,
- mass transfer coefficient in the process of aeration of liquids,
- sieve analysis,
- purification in a chamber dust collector,
- dust removal on the shelf filter,
- foam separation,
- ion exchange,
- separation of petroleum products,



- computer analysis of dust particle images.

Teaching methods

Laboratory exercises, student book.

Bibliography

Basic

1. L. Broniarz-Press, P. Agaciński, M. Ochowiak, J. Różański.: Procesy oczyszczania, Wydawnictwo Politechniki Poznańskiej, Poznań, 2011.
2. Bandrowski J., Merta H., Ziolo J.: Sedymentacja zawiesin. Zasady i projektowanie, Wydawnictwo Politechniki Śląskiej, Gliwice, 2001.
3. Bandrowski J., Troniewski L.: Destylacja i rektyfikacja, Wydawnictwo Politechniki Śląskiej, Gliwice, 1996.
4. Warych J.: Oczyszczanie gazów. Procesy i aparatura, WNT, Warszawa, 1998.

Additional

1. Broniarz-Press L. i inni: Inżynieria Chemiczna i Procesowa. Materiały Pomocnicze. I. Reologia techniczna i procesy przenoszenia pędu, Wydawnictwo Politechniki Poznańskiej, Poznań, 1999
2. Broniarz-Press L. i inni: Inżynieria Chemiczna i Procesowa. Materiały Pomocnicze. II. Procesy wymiany ciepła, Wydawnictwo Politechniki Poznańskiej, Poznań, 2001
3. Broniarz-Press L. i inni: Inżynieria chemiczna i procesowa. Materiały pomocnicze. III. Procesy wymiany masy, Wydawnictwo Politechniki Poznańskiej, Poznań, 2005
4. Selecki A., Gawroński R.: Podstawy projektowania wybranych procesów rozdzielania mieszanin, WNT, Warszawa, 1992
5. Hobler T.: Dyfuzyjny ruch masy i absorbery, WNT, Warszawa, 1976.
6. Hobler T.: Ruch ciepła i wymienniki, WNT, Warszawa, 1986.

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,0
Classes requiring direct contact with the teacher	50	2
Student's own work (literature studies, preparation for laboratory classes, preparation for test, reports preparation) ¹	25	1

¹ delete or add other activities as appropriate