COURSE DESCRIPTION CARD - SYLLABUS

Course name

Engineering of selected 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

15

Laboratory classes

Other (e.g. online)

Tutorials

Projects/seminars

30

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

dr hab. inż. Sylwia Różańska

e-mail: sylwia.rozanska@put.poznan.pl

tel. 61 665 2789

Wydział Technologii Chemicznej

Instytut Technologii i Inżynierii Chemicznej

ul. Berdychowo 4, 60-965 Poznań

Responsible for the course/lecturer:

Prerequisites

Students starting this subject should have basic knowledge in fundamentals of chemical engineering, chemical technology, process kinetics and engineering graphics. They should also have the ability to use spreadsheets, performing statistical analysis of measurement results and be ready to work in a team.

Course objective

Provide students with basic knowledge in the field of processing in the chemical, mineral, food, agricultural, pharmaceutical and cosmetic industries. Developing students' ability to solve problems appearing in the design of devices and apparatus in the chemical and related industries.

Course-related learning outcomes

Knowledge

1. A Student has expanded and in-depth knowledge in chemistry and other related areas of science, allowing to formulate and solve complex tasks related to chemical engineering [K_W03]

2. A student has knowledge of complex chemical processes, including the appropriate selection of materials, raw materials, apparatus and devices for the implementation of chemical processes and the characterization of the obtained products [K_W04]

3. The student has a well-established and expanded knowledge of the selected specialization [K_W12]

Skills

1. A student has the ability to work in a team and to lead a team [K_U02]

2. A student has the ability to present research results in the form of a report, dissertation or presentation [K_U06]

3. A student has the ability to analyze and solve problems related to chemical technology and process engineering, using theoretical, analytical, simulation and experimental methods [K_U09]

4. A student has the ability to use the knowledge acquired as part of the specialization in professional activity [K_U20]

Social competences

1. A student is able to interact and work in a group, taking on different roles [K_K03]

2. The student is able to properly define the priorities for the implementation of the tasks set by himself or others [K_K04]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The knowledge acquired during the lecture is verified during the written exam in a stationary or remote form. The exam consists of 5-6 open questions for the same number of points. Minimum threshold: 50% points.

The topics, on the basis of which questions are formed, will be sent to students by e-mail using the university e-mail system or made available in the e-courses platform.

Skills acquired as part of the project classes are verified based on the developed rectification column project (in groups of one or two) and the multimedia presentation on the topic given by the teacher (in groups of two or three).

Passes the rectification column project has a form of defense taking place during the last and penultimate classes. The final grade for the project is the sum of partial points for the documentation (40 points) and the oral answer to the questions (60 points).

The summary final grade for the project classes will be issued based on the average grade for the defense of the project and the grade for the multimedia presentation.

Programme content

1. Manufacturing and technological production process, manufacturing system (basic definitions and divisions)

2. Selected mechanical processes

3. Size reduction (theoretical basis, size reduction theories, apparatus for size reduction), application

4. Granulation (theoretical basis, apparatus and equipment for pressure and non-pressure granulation), application

5. Calculation of disk granulators and ball mills

6. Tableting and briquetting (theoretical basics, tableting and briquetting devices), application.

7. Basic methods of plastic processing (extrusion, injection, calendering, pressing, casting, laminating)

8. Rubber processing, vulcanization

9. Rubber waste recycling

10. Food additives (application, properties, division)

11. Flows through porous beds

Teaching methods

1. Lecture: multimedia presentation, illustrated with examples on the board.

2. Project: multimedia presentation, illustrated with examples on the board.

Bibliography

Basic

1. Richardson J.F., Harker J.H., Backhurst J.R., Chemical Engineering Volume 2 - Particle Technology and Separation Processes (5th Edition), Elsevier, 2002

2. Ashok Gupta,Denis Yan, Mineral Processing Design and Operation: An Introduction, Elsevier, 2006

3. Imeson A., Food Stabilisers, Thickeners and Gelling Agents, John Wiley & Sons Ltd, United Kingdom, 2010.

4. Ochowiak, M., Woziwodzki, S., Doligalski, M., Mitkowski, P.T. Practical Aspects of Chemical Engineering, Springer, 2018

5. Berk Z., Food Process Engineering and Technology (3rd Edition), Elsevier, 2018

Additional

1. Vogelpohl A., Disstilation, The Gruyter, 2015

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,0
Classes requiring direct contact with the teacher	45	2,0
Student's own work (literature studies, preparation for classes, preparation for exam, project preparation) [1]	30	1,0

[1] delete or add other activities as appropriate