COURSE DESCRIPTION CARD - SYLLABUS

Course name

Principle of chemical technology/kinetic of reaction

Course

Field of study

Environmental Protection Technologies

Year/Semester

III/5

Area of study (specialization)

-

Profile of study

general academic

Level of study

First-cycle studies

Course offered in

polish

Form of study

full-time

Requirements

elective

Number of hours

Lecture

0

Laboratory classes

0

Other (e.g. online)

0

Tutorials

0

Projects/seminars

15

Number of credit points

1

Lecturers

Responsible for the course/lecturer:

dr hab. inż. Katarzyna Staszak

Responsible for the course/lecturer:

dr inż. Monika Rojewska

Prerequisites

Students has knowledge of mathematics to the extent that allows him to use mathematical methods to describe chemical processes and make calculations needed in engineering practice.

He can obtain information from literature, databases and other sources related to chemical sciences, he can interpret it, draw conclusions and formulate opinions.

Understands the need to improve their professional and personal skills.

Course objective

Achieving knowledge in the field of chemical technology

Course-related learning outcomes

Knowledge

Student has a knowledge of mathematics which allows him/her to use mathematical methods to describe chemical processes and to perform calculations needed in engineering practice [K_W01].

Student knows the foundations of kinetics, thermodynamics and catalysis of chemical processes [K_W08]

Skills

Student works individually and works effectively in a team [K_U02].

Student uses computer programs assisting the implementation of typical tasks in environmental protection technologies [K_U07].

Social competences

Student understands the need for further education and improvement of his/her professional and personal competences. He/she is aware of the importance and understanding of non-technical aspects and effects of engineering activities, including their impact on the environment and the related responsibility for decisions taken (K_K01, K_K02).

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Semester evaluation of the completed projects, consisting of a preliminary pre-project analysis, the quality of the completed project and the preparation of the final report.

In the case of stationary classes, credit is given in a computer laboratory, while in the case of online classes credit is given using the university's network and computer infrastructure (VPN) via the Remote Desktop Protocol (RDP) using a remote desktop connection tool.

Programme content

During the classes, the students develop projects related to solving the problems of kinetics of simple and complex reactions using non-linear algebraic and differential equations. Students analyze the influence of stoichiometry of chemical reaction, heat of reaction, temperature and process conditions (non-stationary or stationary) in the course of chemical reaction in different types of reactors.

Teaching methods

Presentation of aproaches for equation resolution and nonlinear equation systems with the Mathcad tool. At this stage, the teacher assists students in using the CAD tool without solving any design problems.

During the completion of target credit projects, students are assisted in the functioning of the software, but they make their own design decisions for which they are responsible.

Bibliography

Basic

1. J. Szarawara, J. Skrzypek, A. Gawdzik, “Podstawy inżynierii reaktorów chemicznych”, WNT Warszawa 1991.

2. A.Burghardt, G. Bartelmus, „Inżynieria reaktorów chemicznych”, PWN Warszawa 2001.

3. M. Wiśniewski, K. Alejski, Podstawy technologii chemicznej i inżynierii reaktorów, Wyd. P. P., Poznań 2017.

Additional

1. S. Bretsznajder, W. Kawecki, J. Leyko, R. Marcinkowski, “Podstawy ogólne technologii chemicznej”, WNT Warszawa 1973.

2 A. L. Myers, W.D. Seider, “Obliczenia komputerowe w inżynierii chemicznej”, WNT Warszawa 1979.

Breakdown of average student's workload

	Hours	ECTS
Total workload	30	1,0
Classes requiring direct contact with the teacher	20	0,7
Student's own work (literature studies, preparation for tutorials, projects preparation) [1]	10	0,3

[1] delete or add other activities as appropriate