POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

COURSE DESCRIPTION CARD - SYLLABUS

Course name
Computer methods in chemical technology [S1TCh2>MKwTC]

Course

Field of study	**Year/Semester**
Chemical Technology	3/5
Area of study (specialization)	**Profile of study**
–	general academic
Level of study	**Course offered in**
first-cycle	Polish
Form of study	**Requirements**
full-time	elective

Number of hours

Lecture	**Laboratory classes**	**Other**
0	0	0
Tutorials	**Projects/seminars**	
0	15	

Number of credit points

1,00

Coordinators

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Lecturers

Prerequisites

He 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

Gaining knowledge in the basics of chemical technology.

Course-related learning outcomes

Knowledge:
The student has knowledge of mathematics in the scope allowing to use mathematical methods to describe chemical processes and make calculations needed in engineering practice He knows the basics of kinetics, thermodynamics and catalysis of chemical processes (K_W01, K_W03, K_W06, K_W07).

Skills:
The student works individually and effectively in a team. He or she uses computer programs that support the realization of tasks typical for chemical technology (K_U01, K_U06, K_U07, K_U14).

Social competences:
The 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_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, through independent completion of project tasks by the student, 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
Issues concerning the basics of chemical technology.

Course topics
In this course, students carry out projects related to the mathematical description of chemical reactors described by systems of non-linear algebraic and differential equations, taking into account the mode of operation of the reactor, the dosage method and thermal effects, as well as the course of the chemical reaction. Mass and heat balance equations are analysed.

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	25	1,00
Classes requiring direct contact with the teacher	15	0,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	10	0,50