



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Podstawy technologii chemicznej (Fundamentals of chemical technology)

### Course

Field of study

Year/Semester

Technologia chemiczna (Chemical Technology)

III/5

Area of study (specialization)

Profile of study

-

general academic

Level of study

Course offered in

First-cycle studies

Polish

Form of study

Requirements

full-time

compulsory

### Number of hours

Lecture

Laboratory classes

Other (e.g. online)

0

0

0

Tutorials

Projects/seminars

15

0

### Number of credit points

1

### Lecturers

Responsible for the course/lecturer:

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Responsible for the course/lecturer:

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### Prerequisites

1. A student has basic knowledge of mathematics to the extent that enables the use of mathematical methods to describe chemical issues and processes and to perform calculations needed in engineering activities.
2. A student has basic knowledge of chemistry to enable understanding of chemical phenomena and processes.
3. A student has basic knowledge of products and processes used in chemical technology.
4. A student has the ability to use Excel in the field of calculations and graphs.



5. A student understands the need for further training and raising his professional and personal competences, is able to interact and work in a group, is able to think and act in a creative and entrepreneurial way.

### **Course objective**

Extending knowledge of the fundamentals of chemical technology with issues related to chemical equilibrium, the impact of various parameters on the reaction equilibrium, and the rate of complex reactions.

### **Course-related learning outcomes**

#### Knowledge

1. A student has knowledge in the field of technology and chemical engineering. [K\_W13]
2. A student knows the basic methods, techniques, tools and materials used to solve simple tasks in the field of technology and chemical engineering - simulation of chemical reaction with distillation (reactive distillation). [K\_W15]

#### Skills

1. A student is able to obtain the necessary information from literature, databases and other sources related to chemical sciences, correctly interprets it, draws conclusions, formulates and justifies opinions. [K\_U01]
2. A student can work both individually and as a team member. [K\_U02]
3. A student is able to prepare and present in Polish or English an oral presentation on exercises in the fundamentals of chemical technology. [K\_U04]
4. A student uses computer programs (Excel, RECTIFICATION) supporting the implementation of tasks typical for chemical technology and engineering, examines the course of chemical processes and properly interprets the results obtained. [K\_U07]
5. A student, when formulating and solving tasks, can see their systemic and non-technical aspects. [K\_U09]

#### Social competences

1. A student understands the need for further training and raising their professional, personal and social competences. [K\_K01]
2. A student can interact and work in a group. [K\_K03]
3. A student is able to properly set priorities for the implementation of the task. [K\_K04]

### **Methods for verifying learning outcomes and assessment criteria**

Learning outcomes presented above are verified as follows:

Ongoing control of calculations and simulation results, presentation of simulation results by students in Power Point presentations, colloquium on calculations related to chemical equilibrium.



## Programme content

Classes include issues related to chemical equilibrium, the impact of various parameters on the change of equilibrium - on the example of a simulation of chemical reaction with distillation (reactive distillation) using a computer program RECTIFICATION. Classes also include calculation exercises in the field of chemical equilibrium and the rate of complex reactions.

## Teaching methods

Team work, computer simulations, problem solving, presentation of results, discussion

## Bibliography

Basic

1. Z. Ziołkowski, Destylacja i rektyfikacja w przemyśle chemicznym, WNT, Warszawa 1978.
2. T. Ufnalski, Równowagi chemiczne, WNT, Warszawa 1995.
3. J. Szarawara, J. Piotrowski, Podstawy teoretyczne technologii chemicznej, WNT, Warszawa 2010.
4. S. Bretsznajder, Podstawy ogólne technologii chemicznej, WNT, Warszawa 1973.

e-zasoby Biblioteki PP, baza e-booków Knovel:

1. O. Levenspiel, Chemical Reaction Engineering, Wiley&Sons, USA 1999.
2. A. Kayode Coke, Ludwig's Applied Process Design for Chemical and Petrochemical Plants, Volume 2 (4th Edition), Elsevier, USA 2010.

Additional

1. K. Alejski, I. Miesiąc, K. Prochaska, M. Regel-Rosocka, A. Sobczyńska, J. Staniewski, K. Staszak, M. Staszak, M. Wiśniewski, Podstawy technologii chemicznej i inżynieria reaktorów. Część I i II. Pod redakcją M. Wiśniewskiego i K. Alejskiego, Wyd. Politechniki Poznańskiej, Poznań 2017.

## Breakdown of average student's workload

	Hours	ECTS
Total workload	25	1,0
Classes requiring direct contact with the teacher	15	0,8
Student's own work (literature studies, preparation for tutorials, preparation for cologium, simulation and presentation preparation) <sup>1</sup>	10	0,2

<sup>1</sup> delete or add other activities as appropriate