



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Chemometrics and Elements of Statistics

### Course

Field of study

Chemical Technology

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

II/4

Profile of study

general academic

Course offered in

English

Requirements

compulsory

### Number of hours

Lecture

15

Laboratory classes

0

Other (e.g. online)

0

Tutorials

30

Projects/seminars

0

### Number of credit points

4

### Lecturers

Responsible for the course/lecturer:

Dr Eng. Joanna Łechtańska

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Faculty of Chemical Technology

ul. Berdychowo 4, 60-965 Poznan

Responsible for the course/lecturer:

### Prerequisites

The student should have basic knowledge in the field of mathematics, the basics of information technology, general chemistry and analytical chemistry.

### Course objective

The main goal of the course is to learn the basics of statistical processing of experimental data (with particular emphasis on data obtained in the chemical laboratory). Moreover, developing skills in reading, processing and presenting statistical data.

### Course-related learning outcomes

Knowledge

A student has the necessary knowledge of mathematics in terms of the use of mathematical methods to describe the problems and processes of chemistry, and to perform calculations needed in engineering.

K\_W01



### Skills

The graduate can obtain necessary information from literature, databases and other sources related to chemical sciences, interpret them properly, draw conclusions, formulate and justify opinions.

K\_U01

The graduate can work both individually and in a team environment in a professional and other environment.

K\_U02

The graduate can implement the process of self-learning.

K\_U05

The graduate can use computer programs that support the tasks typical of technology and chemical engineering, plan chemical experiments, examine the course of chemical processes and properly interpret the results obtained.

K\_U07

The graduate can use mathematical knowledge to simulate, design, optimize and characterize simple chemical processes and unit operations.

K\_U08

The graduate can assess the suitability of routine methods and techniques appropriate for solving engineering tasks of a practical nature in chemical technology, can also select and apply the appropriate method and technique.

K\_U14

### Social competences

The graduate understands the need to develop and improve their professional, personal and social competences.

K\_K01

The graduate can cooperate and work on a team, inspire and integrate engineering environments.

K\_K03

The graduate can appropriately determine the priorities for accomplishing the assigned task.

K\_K04

The graduate can correctly identify problems and makes appropriate career choices, in accordance with professional ethics.

K\_K05

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Knowledge acquired during the lecture and first part of the tutorials course is verified on the basis of a written colloquium. In the second part of the course, the project made in MS Excel is evaluated. Activity classes are also assessed. Passing threshold: 50% of points.



## Programme content

The scope of the subject involves issues related to:

- Basic concepts of the probability theory.
- Random variables.
- Basic concepts of mathematical statistics (descriptive statistics).
- Point and interval estimation.
- Statistical hypotheses.
- Simple linear regression and correlation.
- Factorial experiments.
- statistical processing and calculation of experimental data on the MS Excel computer program and presentation of statistical data in the project.

## Teaching methods

1. Lecture: a multimedia presentation illustrated with examples given on the blackboard by the teacher.
2. Tutorials: a multimedia presentation presenting the content of tasks and tips. The Exercises are solved on the blackboard. In the second part of the course a project are made in the MS Excel computer program.

## Bibliography

Basic

Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers, Keying E. Ye, Probability & Statistics for Engineers & Scientists, Global Edition, 9/E, Pearson 2016, 816 pp. ISBN-10: 1292161361 • ISBN-13: 9781292161365

Additional

Aviva Petrie, Caroline Sabin, Medical Statistics at a Glance Text and Workbook, Wiley Blackwell, 2013, 288 pp, ISBN: 978-1-118-50335-5

## Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,0
Classes requiring direct contact with the teacher	55	2,2
Student's own work (literature studies, preparation for classes/tutorials, preparation for tests, project preparation) <sup>1</sup>	45	1,8

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