

Tadeusz Kosciuszko Cracow University of Technology

Course Card

Faculty of Civil Engineering

Field of study: Civil Engineering

Study profile: general academic

Study form: full-time

Field of study code: BUD

Study cycle: 1st

Specialty: no specialty

1 COURSE INFORMATION

Course name	Chemia
Course name in English	Chemistry
Course code	WIL BUD oIS B11 24/25
Course category	Przedmioty podstawowe
No. of ECTS points	4.00
Semester	1 and 2

2 CLASS TYPE, NUMBER OF HOURS ACCORDING TO THE STUDY PLAN

Semester	Lecture	Class exercise	Laboratory	Computer lab	Design exercise	Seminar
1	15	0	0	0	0	0
2	0	0	30	0	0	0

3 COURSE OBJECTIVES

Objective 1 Introducing basic terms concerning cohesion forces of homogeneous and heterogeneous materials.

Objective 2 Providing students with the problems of dispersed systems in civil engineering.

Objective 3 Providing students with surface phenomena and their significance in civil engineering.

Objective 4 Providing students with the issues of kinetics and chemical equilibrium of chemical reactions taking place while obtaining and applying building materials.

Objective 5 Gaining team work experience.

Objective 6 Preparing students for scientific practice

4 PREREQUISITES IN TERMS OF KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1 Basic knowledge of chemistry within the scope of the high school program.

5 LEARNING OUTCOMES

LO1 Knowledge A student describes basic notions concerning cohesive forces in homogeneous materials and dispersed systems.

LO2 Skills A student is able to define types of dispersed systems in civil engineering and describe their properties.

LO3 Knowledge A student is able to explain the importance of surface phenomena for durability of building materials.

LO4 Skills A student defines basic thermodynamic and kinetic quantities of reactions taking place in civil engineering and describes processes of concrete and steel corrosion.

LO5 Skills A student is able to carry out the analysis of the usability of water used for civil engineering purposes and write down characteristic reactions connected with obtaining and application of building materials.

LO6 Knowledge A student knows selected processes concerning high-molecular compounds and discerns cement- polymeric systems.

LO7 Knowledge A student is able to work in a team.

6 COURSE CONTENT

Lecture		
No.	Subject matter of the course Detailed description of thematic blocks	No. of class hours
L1	Cohesive forces of homogeneous and heterogeneous materials. States of matter: characterization of liquids, structure of solids crystalline structures and their defects.	2
L2	Chemistry of metals. Basics of electrochemistry: electrolysis, cells. Corrosion of steel.	3
L3	Characterization and division of chemical reactions taking place in civil engineering. Kinetics and chemical equilibrium.	2
L4	Surface phenomena and their significance in civil engineering.	4
L5	Production and chemistry of mineral building materials, especially chemistry of binding materials. Corrosion of cement composites.	2

Lecture		
No.	Subject matter of the course Detailed description of thematic blocks	No. of class hours
L6	Chemistry of polymers and bituminous materials.	1
L7	Macroscopic dispersion on the example of concrete and polymeric composites.	1

Laboratory		
No.	Subject matter of the course Detailed description of thematic blocks	No. of class hours
L1	Naming laboratory equipment and inorganic compounds. Concentrations of solutions.	2
L2	Introduction to processes taking place in building materials.	4
L3	Production, setting and application of cement, lime and gypsum binders.	4
L4	Corrosion processes of cement materials.	4
L5	Corrosion of metals.	4
L6	Plastics in civil engineering.	4
L7	Additions and admixtures to mineral binders.	4
L8	Mixing water and concrete exposure classes.	4

7 TEACHING TOOLS

N1 Lectures

N2 Multimedia presentations

N3 Laboratory classes

N4 Consultations

N5 Others

8 Student workload

Activity form	Number of hours of activity
Hours realized in contact with the teacher	
Hours resulting from the study plan	45
Consultation hours	6
Exams and tests during session	9
Hours of autonomous student work	
Preparing for classes, studying literature	30
Developing results	10
Preparing of reports, projects presentations, discussion	20
Total number of hours devoted to the subject	120
Total number of ECTS points	4.00

9 Methods of grading

Partial grades

F1 Grades from tests concerning each main topic and lab report models (in the case of the laboratory classes)

F3 A test from lectures

Summary grade

P2 Mean grade calculated based on all partial grades

Conditions for passing the course

L1 a. Only the students who have successfully completed the lecture course can attend laboratory classes

L2 At least E grade from lectures and laboratory classes
