

# 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            | Geologia              |
| Course name in English | Geology               |
| Course code            | WIL BUD oIS B9 24/25  |
| Course category        | Przedmioty podstawowe |
| No. of ECTS points     | 2.00                  |
| Semester               | 1                     |

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

| Semester | Lecture | Class exercise | Laboratory | Computer lab | Design exercise | Seminar |
|----------|---------|----------------|------------|--------------|-----------------|---------|
| 1        | 15      | 0              | 15         | 0            | 0               | 0       |

### 3 COURSE OBJECTIVES

**Objective 1** The course is designed to provide a knowledge to the basic issues of Geology - internal and external processes of the Earth System.

## 4 PREREQUISITES IN TERMS OF KNOWLEDGE, SKILLS AND OTHER COMPETENCES

## 5 LEARNING OUTCOMES

**LO1 Knowledge** Student will take knowledge of the Geology as the Earth Science and Earth History and overview of its basic principles. Student gets knowledge about geological materials and processes, know the main minerals and petrographic types of rocks that can be applied as raw materials (building stones, aggregates, clay minerals, salts and other chemical minerals); knows relationships between origin of the rock and its petrographic, structural and textural features and, mechanical properties.

**LO2 Skills** Student is able to identify, examine and describe basic types of rocks and is able to select proper scientific method and proper tools for practical application.

**LO3 Knowledge** Student is able to work in a team and plan, share and compile stages of the project and contribution of the team members.

**LO4 Knowledge** Student will develop valuable skills including critical thinking, written communication, quantitative and technical literacy, teamwork, and problem solving.

## 6 COURSE CONTENT

| Lecture |   |                    |
|---------|---|--------------------|
| No.     | Subject matter of the course<br>Detailed description of thematic blocks   | No. of class hours |
| L1      | 1. Dynamic Earth: course overview, geology overview, geologic time, Earth origins and structure, Earth as a system, the Rock Cycle, Continental Drift, Plate Tectonics  | 2                  |
| L2      | Earth Materials: minerals, physical properties of minerals, mineral groups and resources, igneous rocks, magma origin and composition, types of igneous rocks, classification of igneous rocks, sedimentary rocks, types of sedimentary rocks, detrital sedimentary rocks, chemical sedimentary rocks, classification of sedimentary rocks, Sedimentary environments, sedimentary structures, metamorphic Rocks | 5                  |
| L3      | Surface Processes: Weathering & Soils, hydrologic cycle, landslides, streams & floods, groundwater, glaciers & ice ages, atmosphere, climate, deserts   | 2                  |
| L4      | Tectonics: volcanoes & other igneous activity, earthquakes and earths interior, seismology, earthquake destruction, seismic waves and earths structure, mountain building, deformation, folds, faults, joints, mountain belts,  | 5                  |
| L5      | Elementary soil mechanics: Engineering classification of soils, soil gradation, compaction, consolidation, effective stress, Mechanical and chemical weathering, soil profiles, physical and mechanical properties of soils, Classification of soil particle size and texture,  | 1                  |

| <b>Laboratory</b> |  |                                   |
|-------------------|--|-----------------------------------|
| <b>No.</b>        | <b>Subject matter of the course<br/>Detailed description of thematic blocks</b>  | <b>No. of<br/>class<br/>hours</b> |
| <b>L1</b>         | Mineral Identification: Physical and optical properties of minerals, Structure and classification of silicate minerals, Identify and describe the readily observable properties of minerals and use these properties to identify common minerals with the aid of a flowchart.  | 2                                 |
| <b>L2</b>         | Igneous Rock Identification: Textures and structures of Igneous rocks, Classification of Igneous rocks Volcanic , Plutonic and Hypabyssal Igneous rocks, Magmatism   | 2                                 |
| <b>L3</b>         | Sedimentary Rock Identification: Sedimentary structures (Physical structures, Biogenic sedimentary structures, Diagenetic structures), Sedimentary textures (Granulometric analysis, shape and roundness studies, surface textures), Petrography of rocks of clastic, chemical and biochemical origin (Conglomerates, Sandstone, Mudstone, Limestone & Dolomite), Evaporite, Phosphorite, Chert, Iron and Manganese rich sediments, Volcanogenic sedimentary rocks | 2                                 |
| <b>L4</b>         | Metamorphic Rock Identification: Grades of Metamorphism, Common minerals of metamorphic rocks, Metamorphic Texture and Structures, Metamorphic facies, Metramorphism types & products  | 2                                 |
| <b>L5</b>         | Structural Geology/Geologic Maps Interpret and identify the major types of geologic structures (including faults) by completing the subsurface portions of block diagrams given only the outcrop patterns, Identify and describe erosional and depositional fluvial landforms on a map or photographic image.  | 2                                 |
| <b>L6</b>         | Construction of geological profiles and structural cross section in Geostar, Interpretation of profile sections across the geological maps.  | 2                                 |
| <b>L7</b>         | Elementary soil mechanics; Engineering classification of soils, index properties.  | 2                                 |
| <b>L8</b>         | The diagnosis and the description of the geological structure up to investment based on the map  | 1                                 |

## **7 TEACHING TOOLS**

**N1** Lectures

**N2** Laboratories

**N3** Presentations

**N4** Practical exercise

**N5** Discussion

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## 8 Student workload

| Activity form  | Number of hours of activity |
|--|-----------------------------|
| <b>Hours realized in contact with the teacher</b>        |                             |
| Hours resulting from the study plan                      | 30                          |
| Consultation hours                                       | 4                           |
| Exams and tests during session                           | 2                           |
| <b>Hours of autonomous student work</b>                  |                             |
| Preparing for classes, studying literature               | 10                          |
| Developing results                                       | 8                           |
| Preparing of reports, projects presentations, discussion | 2                           |
| <b>Total number of hours devoted to the subject</b>      | <b>56</b>                   |
| Total number of ECTS points                              | 2.00                        |

## 9 Methods of grading

### Partial grades

F1 Test

F2 Practical exercise

F3 Individual project

F4 Team project

### Summary grade

P1 Weighted average of grades

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