Engineering Geology

1. **Course number and name:** 020GEIGS4 Engineering Geology

2. **Credits and contact hours:** 2 ECTS credits, (1)x1.25 hours

3. **Name(s) of instructor(s) or course coordinator(s):** Soumaya Ayadi Maasri

4. **Instructional Materials:**
   - **a.** Professor class notes and course material
   - **b.** Scientific papers
   - **c.** Field trip

5. **Specific course information**
   - **a. Catalog description:** Engineering Geology represents the connection between geological sciences and civil engineering techniques. This course explains the characteristics of surface and subsurface geology, the physicochemical properties of rocks and the hydrographic network. It covers different kinds of natural hazards such as mass movement, landslide, flooding, and earthquakes. It explains the origin of natural hazards and their impact on civil engineering projects. It also focuses on the importance of understanding regional geology. This course aims at enabling students to give coherent interpretations of the geological context and its foreseeable development; and to integrate geological parameters into the early phases of the project in order to guarantee its success and ensure its durability.

   - **b. Prerequisites or co-requisites:** None

   - **c. Required:** Restricted Elective

6. **Educational objectives for the course**
   - **a. Specific outcomes of instruction:**
     By the end of the course, the student will be able to:
     - recognize fundamental geological notions that enable the engineer to construct a clear and concrete vision of the different geological and geomorphological environments in which a civil engineering projects can be developed
     - estimate and identify natural hazards that may occur and threaten the success or sustainability of projects
     - identify potential difficulties related to geological phenomena, in civil engineering projects
     - understand the importance of regional geology and its added value in decision-making in civil engineering projects

b. PI addressed by the course:

PI	1.2	2.1
Covered	yes	yes
Assessed		

7. Brief list of topics to be covered:

a) Surface and sub-surface geology (2.5 hours)

- Stratigraphy
- Structural geology and rock mechanics
- Karst structures

b) Petrography, lithology and geomaterials (2.5 hours)

- Physicochemical properties of rocks
- Rocks behavior
- Soil lithology
- Geomaterials

c) Engineering geology and natural hazards (5 hours)

- Mass movement: Landslides, collapses…
- Flooding
- Earthquake

d) Cartography (2.5 hours)

- Topographic map
- Geological map and geological section

e) Engineering geology and structures (3.75 hours)

Geological problems: Case studies

- Impact of regional geology on civil engineering projects
- Impacts of civil engineering developments on the geological environment

f) Field trip