



## Course Syllabus

<b>Course Code</b>	<b>Course Title</b>	<b>ECTS Credits</b>
GEOL-110	Physical Geology	6
<b>Prerequisites</b>	<b>Department</b>	<b>Semester</b>
None	Engineering	Fall/Spring
<b>Type of Course</b>	<b>Field</b>	<b>Language of Instruction</b>
Elective	Oil and Gas Engineering	English
<b>Level of Course</b>	<b>Lecturer(s)</b>	<b>Year of Study</b>
1 <sup>st</sup> Cycle	Dr Stefano Patruno	1 <sup>st</sup>
<b>Mode of Delivery</b>	<b>Work Placement</b>	<b>Corequisites</b>
Face-to-face	N/A	None

### Course Objectives:

The main objectives of the course are to:

- Introduce the study of the Geology science.
- Introduce the students to the geologic processes that created the Earth system.
- Explain the theory of plate tectonics and how the three major families of rocks are created.
- Provide knowledge on how Igneous rocks are created.
- Understand the creation of Sedimentary Rocks.
- Underline the importance of the conditions that create Metamorphic rocks.
- Identify how sediments convert to sedimentary rocks and what types of sedimentary rocks host hydrocarbons.
- Familiarize students with the operation and effects of the various internal processes that comprise the geological environment of the Earth and shape its evolution over geological time.
- Develop the student ability to identify and interpret earth materials, processes and features.
- Obtain basic knowledge of geological maps and designing geologic sections and underlying layers.

### Learning Outcomes:

After completion of the course students are expected to be able to:

1. Know how the earth system works.
2. Explain the geologic processes that created the three major families of rocks.
3. Understand the basic structure of the earth and the nature of solid earth materials.

4. Identify common minerals and rocks.
5. Describe the physical processes that operate to reshape our dynamic planet.
6. Understand the concept of geologic time and be familiar with the geologic time scale.
7. Understand the causes of geologic hazards such as earthquakes, volcanic eruptions and landslides.
8. Understand the formation and extent of geologic resources such as soil, mineral ores, fossil fuels, and sustainable use.
9. Be able to communicate their understanding of geologic issues to others.
10. Interpret the various types of rocks (igneous, sedimentary and metamorphic).
11. Illustrate through design of sections the surface topography and the underlying layers from geologic maps.
12. Examine various types of rocks in the field (compulsory field trip)

**Course Content:**

- Introduction to geologic processes
- Basic concepts and terms.
- The earth system.
- Internal processes: Plate tectonics
- Weathering and erosion
- Igneous rocks (processes of magma solidification)
- Sedimentary rocks (formation of rocks by surface processes)
- Metamorphic rocks (alterations of rocks by temperature and pressure increase).
- The rock cycle
- Geologic time scale.
- Maps laboratory.
- Compulsory field trip.

**Learning Activities and Teaching Methods:**

Lectures, in-class examples, laboratory exercises, projects, compulsory field trip, discussion.

**Assessment Methods:**

Homework assignments, Laboratory reports, Mid-term examination, Final examination.

**Required Textbooks / Readings:**

<b>Title</b>	<b>Author(s)</b>	<b>Publisher</b>	<b>Year</b>	<b>ISBN</b>
Understanding Earth 7th Edition	John Grotzinger and Tom Jordan	Macmillan Learning	2014	978-1464138744
Introduction to Physical Geology 2nd Edition	Graham Thompson and Jonathan Turk	Brooks Cole	1997	0030243483

**Recommended Textbooks / Readings:**

<b>Title</b>	<b>Author(s)</b>	<b>Publisher</b>	<b>Year</b>	<b>ISBN</b>
Essentials of Geology	Frederick Lutgens, Edward Tarbuck and Dennis Tasa	Pearson	2017	978- 0134446622