
COURSE/MODULE: GEOLOGY I

ACADEMIC YEAR: 2019-2020

TYPE OF EDUCATIONAL ACTIVITY: Base

TEACHER: Giacomo Prosser

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Language: Italian

ECTS: 6(lessons n.3;
tutorials/practice n. 3)**n. of hours: 60**(lessons n. 24;
tutorials/practice n. 36)**Campus: Potenza**Dept: **Department of Sciences**
Program: **Course in Geological
Sciences (L-34)****Semester: first****(October 1st, 2019 to
December 20th 2019 –
January 20th, 2020)**

EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

The course has the following educational goals:

- 1) Provide a general view of the structure and the geodynamic evolution of the Planet Earth in order to outline the connections between the different topics treated during the Bachelor course in geological sciences.
- 2) Introduce the students on the spatial and temporal scales of the geological processes.
- 3) Provide an introduction on the geometrical features of the geological structures and the related tectonic and geodynamic settings.
- 4) Describe the geological and geodynamic processes that can be recognized in the central Mediterranean area and in the southern Apennine mountain belt.

The main abilities acquired at the end of the course will be:

- 1) Understanding the model of the plate tectonics.
- 2) Applying the classification schemes used for igneous and metamorphic rocks that represent the main components of the lithosphere.
- 3) Provide a simple description of the main tectonic structures and stratigraphic units from outcrop data.
- 4) Recognizing the main tectonic structures and distinguishing the tectono-stratigraphic units in regional-scale geological maps.
- 5) Locating on a topographic map some stratigraphic and tectonic elements (such as faults, stratigraphic boundaries, overthrusts and folds).

PRE-REQUIREMENTSNone

SYLLABUS

- 1) Introduction to the structure and the dynamics of the Planet Earth. An introduction on the time scales used for the geological processes. The internal structure of the Earth; compositions of the core, the mantle and the crust; the meaning of the lithosphere; the meaning of isostasy.
 - 2) An introduction to the main rock-forming minerals. Rock classification. Practical training on the classification diagrams used for igneous and metamorphic rocks; using a lens for recognizing the main rock-forming minerals.
 - 3) Plate tectonics. Historical background on the continental drift; seafloor spreading; the plate tectonics theory; oceanic and continental crust; thermal and compositional stratification of the crust; divergent, convergent and transform margins; the possible causes of plate tectonics.
 - 4) Volcanoes and earthquakes; seismic and volcanic activity in the frame of the plate tectonics theory and the features of the different plate margins.
 - 5) An introduction on rock deformation. The geometry of the main tectonic structures (faults and folds). Practical training on the description of the main tectonic structures in regional-scale geological maps.
 - 6) The orogenesis and the main orogenic cycles recognized in the Mediterranean area. Genesis and main features of the mountain belts. Magmatism and metamorphism related to orogenic processes.
 - 7) Tectonic and geodynamic features of the Mediterranean area and the Southern Apennines. Practical training on the description of the main tectono-stratigraphic units cropping out in Southern Apennines by using regional-scale
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geological or tectonic maps.

8) Practical field training (two days) to introduce the methods used for geological mapping (rock classification in the field, description of an outcrop, use of the geological compass for measuring the attitude of bedding planes, location of an outcrop on a topographic map) and to recognize the geological features of the Southern Apennines.

TEACHING METHODS

The course will include lectures, followed by practical training in classroom and in the field (use of geological maps for the description of faults, folds and tectono-stratigraphic units; observations on minerals and rocks with a lens; location outcrops on a topographic map; description of an outcrop on a field-notebook; some elements on the usage of a geological compass). Two one-day excursions in selected areas of the southern Apennines will allow the students to perform observations on different types of tectonic structures and tectono-stratigraphic units.

EVALUATION METHODS

A mid-term written examination on the classification of rock samples and the usage of geological maps will take place during the second half of the course. The final oral exam, regarding the theoretical topics treated in the course, will be integrated with the final examination of the course "Geology module 2". Only students that passed the mid-term examination will be allowed to access the final oral exam. Moreover, the students should deliver a short report on the results of the field trip before the oral examination.

TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

- Livio Trevisan, Gaetano Giglia. Introduzione alla geologia, Pacini Editore (2003).
- Pompeo L. Casati. Scienze della Terra. Vol. 1: Elementi di geologia generale. CittàStudi (2012).

Powerpoint slides, classification diagrams and geological/tectonic maps used for the practical training will be available on the e-learning site of UNIBAS.

INTERACTION WITH STUDENTS

The teacher may answer to questions on the course and provide teaching material in the following days:

	<i>from</i>	<i>to</i>	<i>Where:</i>
<i>MONDAY</i>			
<i>TUESDAY</i>	<i>9:30</i>	<i>11:30</i>	<i>Cartography laboratory or Giacomo Prosser's room (Campus Macchia Romana)</i>
<i>WEDNESDAY</i>			
<i>THURSDAY</i>	<i>15:30</i>	<i>17:30</i>	<i>Cartography laboratory or Giacomo Prosser's room (Campus Macchia Romana)</i>
<i>FRIDAY</i>			

Students may ask for further appointments by phone and/or e-mail

EXAMINATION SESSIONS (FORECAST)¹

20/01/2020, 10/02/2020, 09/03/2020, 06/04/2020, 11/05/2020, 15/06/2020, 13/07/2020, 07/09/2020, 05/10/2020, 16/11/2020..

SEMINARS BY EXTERNAL EXPERTS YES NO

FURTHER INFORMATION

¹ Subject to possible changes: check the web site of the Teacher or the Department/School for updates.