
COURSE: Geological Mapping module 2

ACADEMIC YEAR: 2019-2020

TYPE OF EDUCATIONAL ACTIVITY: Characterizing

TEACHER: Giacomo Prosser

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Language: Italian

ECTS: 5(lessons n.2;
tutorials/practice n. 3)**n. of hours: 52**(lessons n. 16;
tutorials/practice n. 36)**Campus: Potenza**Dept: **Department of Sciences**
Program: **Course in Geological
Sciences (L-34)****Semester: second****(March 2nd, 2020 to
May 31st – June 20th,
2020)**

EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

The course aims at providing the basic information on the interpretation of geological structures based in field and map data. In more detail, the main goals of the course are:

- 1) To introduce the main methods used for the 3D reconstruction of the geological structures (folds and faults), on the basis of geological maps, using the structure contour method.
- 2) To describe the projection methods for attitude data for the interpolation methods used for construction fold profiles, to obtain geological cross-sections;
- 3) To have knowledge on the geological setting of the southern Apennines.

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

- 1) Practicing the use of the geological compass for the field measurement of linear and planar structures (fold axes, fault planes and related slickenside striations, joints and cleavage surfaces).
- 2) Practicing the field mapping of structurally complex areas.
- 3) Using information from geological maps to construct structural cross-sections.
- 4) Obtaining 3D information from geological maps to interpret the structural setting of the rock bodies, with particular emphasis on reconstruction of fold geometry and fault displacement.
- 5) Describing, classifying, correlating and representing geological data (i.e., outcrops, lithologies, attitude of bedding planes, stratigraphic boundaries, etc.) on topographic maps.

PRE-REQUIREMENTS

Topics treated in the following courses: - Physical Geography, Geology (general geology, stratigraphy, lithological description), Structural Geology (analysis of geological structures and elements of tectonics)

SYLLABUS

1. Dip and thickness calculations from geological maps; apparent and real dip; apparent and real thickness.
2. Analysis of fold geometry using field data and by applying the structure contour technique.
3. Analysis of attitude and displacement of faults; relationships between faults and folds.
4. Construction of geological cross-sections in structurally complex areas. Projection of map data onto the cross-section plane. Reconstruction of fold geometries by means of different geometrical methods.
5. Introduction to the geology of Southern Apennines;
6. Field exercise: construction of one geological map in a small area of the southern Apennines, where it is possible to document the presence of overthrusts, faults and folds (four days).

TEACHING METHODS

The course will include lectures, numerical and graphical exercises (attitude calculations; thickness of a formation and related uncertainties; geometrical analysis of tectonic and stratigraphic contacts; construction of geological cross-sections) and mapping exercises carried out in the field. In more detail, field exercises will include four one-day excursions in a selected area of the southern Apennines, in order to perform geological mapping in a structurally complex area and to carry out observations of different types of tectonic structures.

EVALUATION METHODS

A mid-term written examination on the construction of geological cross-sections, starting from 1:10.000 and 1:25.000 geological maps, will be held during the second half of the course. The final exam will be integrated with Geological Mapping module 1. It will focus on theoretical and practical aspects of the geological mapping and on the discussion of the geological map, the scientific report and the geological cross-sections resulting from the field exercises.

TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

- Rilevamento Geologico di Giorgio Cremonini - Pitagora Editrice, Bologna.
- Mc Clay K. The mapping of geological structures. Geological Society of London handbook
- Powell D. Interpretation of geological structures through maps. Longman.
- Rowland S.M. & Duebenendorfer E.M. Structural analysis and synthesis. Blackwell Scientific Publications.

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

23/01/2020, 13/02/2020, 12/03/2020, 09/04/2020, 14/05/2020, 18/06/2020, 16/07/2020, 10/09/2020, 08/10/2020, 19/11/2020

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.