
COURSE: PETROGRAPHY

ACADEMIC YEAR: 2019-2020

TYPE OF EDUCATIONAL ACTIVITY: Characterizing

TEACHER: Giovanna Rizzo

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website:

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mobile (optional):

Language: **ITALIANO**

ECTS: **10 CFU**
(7 lessons and 3 practice)n. of hours: **92 (56 lessons**
and **36 practice)**Campus: **Potenza**
Dept./School: **Dipartimento di**
Scienze
Program:Semester:
(date previste di
inizio e fine corso:
04/03/2020,
20/06/2020)

EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

The course of Petrography is dedicated to understanding the petrogenetic processes such as magmatic process and the metamorphic. The goal is to provide students with the bases of petrological and geological events that originate and development within the lithosphere-asthenosphere and develop in the crust (metamorphism and plutonism) or conclude their evolutionary history by cooling the Earth's surface (volcanism).

- **Knowledge and ability to understand:**

The main knowledge provided will be:

- the description, the classification, and the theory on the genesis of magmatic rocks.
- **Ability to apply knowledge and understanding:**

The student must acquire the ability to:

- recognize the minerals constituting the magmatic and metamorphic rocks, therefore the mineralogical association and the structure, in order to classify the rock with the optical microscope;
- knowledge of the magmatic process;
- knowledge of the metamorphic process;

- **Autonomy of judgment:**

The student must be able to know the petrogenetic processes: magmatic and metamorphic.

- **Communication skills:**

The student must have the ability to explain with the scientific language the acquired knowledge.

- **Learning ability:**

The student must be able to update himself by consulting publications and attending courses and seminars.

PRE-REQUIREMENTS

Knowledge of the Chemistry and Mineralogy. It's necessary to have passed the exam of the Chemistry and Mineralogy.

SYLLABUS

Introduction (2 hours): Topic 1. Structure and composition of the Earth. **Topic 2.** The petrogenetic processes.

The magmatic process (27 hours): Topic 1. Physical properties of magma: magmatic temperatures, magma densities and magma viscosities, the volatile components. **Topic 2.** Phase rule. **Topic 3.** Binary systems. Ternary systems. Quaternary systems. **Topic 4.** Equilibrium crystallization and fractional crystallization. Equilibrium fusion and fractional fusion. **Topic 6.** Processes which modify the composition of primary magmas: assimilation, mixing of magmas, ecc. **Topic 7.** Igneous rock associations. **Topic 8.** Genesis of granites.

The metamorphic process (27 hours): Topic 1. Definition, conditions and types of metamorphism. **Topic 2.** Structure of metamorphic rocks. **Topic 3.** Classification and names of metamorphic rocks. **Topic 4.** Zeolites facies. **Topic 5.**

Contact metamorphism. **Topic 6.** Regional metamorphism. **Topic 7.** Granulite facies. **Topic 8.** Eclogite facies. **Topic 9.** Metamorphism and crustal evolution.

The petrographic microscope (36 hours): **Topic 1.** Properties of the minerals: form, colour, relief, Becke line method, pleochroism, optical sign, interference colours, 2V. **Topic 2.** Identification of minerals in magmatic and metamorphic rocks: quartz, feldspars, plagioclase, olivine, pyroxenes, amphiboles, micas, chlorite, opaque minerals, apatite, zircon, titanite, rutile, epidote, serpentine, carbonate minerals, spinels, garnets, prhenite, pumpellyite. **Topic 3.** Identification of magmatic rocks in thin section. **Topic 4.** Identification of metamorphic rocks in thin section

TEACHING METHODS

Theoretical lessons, Laboratory tutorials, Field trip.

EVALUATION METHODS

Report of two rock samples in thin section with an optical microscope and oral examination.

TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

Notes provided by the teacher at the end of each argument

- D'Amico C., Innocenti F. & Sassi F.P. – Magmatismo e Metamorfismo – UTET, Torino, 1987.
 - Morbidelli L. – Le rocce e i loro costituenti. BARDI EDITORE, 2003
 - Wilson B.M. – Igneous Petrogenesis. Chapman Hall, London, 1986.
 - Deer W.A., Howie R.A., Zussman J. – Introduzione ai minerali che costituiscono le rocce. Zanichelli, 1994.
 - Mackenzie W.S., Donaldson C.H., Guilford C. – Atlante delle rocce magmatiche e delle loro tessiture. Zanichelli
 - Peccerillo A., Perugini D. – Introduzione alla Petrografia ottica. Morlacchi, 2003.
 - Yardley B.W.D., Mackenzie W.S., Guilford C. - Atlante delle rocce metamorfiche e delle loro microstrutture. Zanichelli
 - Zezza U. – Petrografia microscopica. La Goliardica Pavese,1996.
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INTERACTION WITH STUDENTS

Meet with students: Mondays from 18-19 hours; Tuesday from 17-18 hours; Wednesday from 17-19 hours; Thursday from 11-13 hours. In addition the teacher is available for a contact with the students, through their email.

EXAMINATION SESSIONS (FORECAST)¹

26/06/2019; 24/07/2019; 25/09/2019; 23/10/2019; 27/11/2019; 18/12/2019; 05/02/2020; 10/03/2020; 09/06/2020; 07/07/2020; 15/09/2020; 13/10/2020; 15/12/2020;

SEMINARS BY EXTERNAL EXPERTS YES X

FURTHER INFORMATION

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