

Academic Year/course: 2021/22

26422 - Igneous and Metamorphic Petrology

Syllabus Information

Academic Year: 2021/22

Subject: 26422 - Igneous and Metamorphic Petrology

Faculty / School: 100 - Facultad de Ciencias

Degree: 296 - Degree in Geology
588 - Degree in Geology

ECTS: 9.0

Year: 3

Semester: Annual

Subject Type: Compulsory

Module:

1. General information

2. Learning goals

3. Assessment (1st and 2nd call)

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

The methodology followed in this course is oriented towards the achievement of the learning objectives. A wide range of teaching and learning tasks are implemented, such as lectures, seminars, laboratory sessions and fieldwork, autonomous work and study and exams.

This course aims to provide students with a basic understanding of the nature and origin of igneous and metamorphic rocks, from their petrographic characteristics, both in the field and under the polarizing microscope, to their origin, distribution, and association with particular tectonic settings. The course also introduces fundamental concepts of geochemistry and mineralogy applied to igneous and metamorphic rocks. Integral practical labs will use petrographic techniques, both hand specimens and optical microscopy to identify and classify the principal igneous and metamorphic rocks based on their geometric and compositional features. It also includes two days of fieldwork, working on two different geological settings, the Quaternary volcanic field of La Garrotxa (Gerona) and the Variscan granitoids and regional and contact metamorphic rocks from the Catalanian Coastal Range around Palamós and Begur (Gerona).

4.2. Learning tasks

This 9 ECTS (225 hours) course is organized as follows:

- **Lectures** (4 ECTS: 40 hours). Two weekly one-hour sessions to present the key concepts and the theory fundamentals of the course.
- **Seminars** (1 ECTS: 10 hours). Two-hour seminars to solve geochemistry problems and to engage the students in the study and identification of igneous and metamorphic rocks in hand specimens.
- **Laboratory sessions** (3 ECTS: 30 hours). Two-hour sessions in the microscopy lab to study thin sections of igneous and metamorphic rocks under the polarizing microscope.
- **Fieldwork** (1 ECTS: 10 hours). 2-day field trip to show in situ important examples of igneous and metamorphic processes.
- **Autonomous work and study** (130 hours)

- **Exams** (5 hours)

Teaching and assessment activities will be carried out on site for as long and as much as possible. This scenario could change if safety regulations related to the covid19 crisis recommended online activities.

Note: the teaching and evaluation activities will be carried out on-site unless, due to the Covid-19 health situation, the provisions issued by the competent authorities and by the University of Zaragoza require them to be carried out online or mixed on-site-online with reduced-capacity rotating groups. Online teaching will not be applied to field practices.

4.3. Syllabus

This course will address the following topics:

Lectures

- Topic 1. Introduction and Methodology (9 hours)
- Topic 2. Origin of Igneous Rocks (4 hours)
- Topic 3. Magma intrusion and extrusion: field relations of plutonic and volcanic rocks (4 hours)
- Topic 4. Characteristics of main igneous rock types (6 hours)
- Topic 5. Magmatic-petrotectonic associations (7 hours)
- Topic 6. Metamorphism and metamorphic rocks (10 hours)

Practice sessions

- Geochemistry seminars: 2 two-hour seminars.
- Identification of igneous and metamorphic rocks in hand specimen: 6 one-hour sessions.
- Identification of igneous and metamorphic rocks under the polarizing microscope: 15 two-hour sessions.

Fieldwork

- One two-day field trip to NE Spain (Catalonia).

4.4. Course planning and calendar

This course starts at the beginning of the academic year in September and ends in May. There is an exam period in February (for the topics covered during the first semester) and another in June (for the topics covered in the second semester). Later in June the final exam takes place for those students that have failed in the February exams or in the early June exams, or both.

Theory lectures are taught in 1h sessions twice a week (Monday and Tuesday from 11 to 12AM). Practice sessions (geochemistry seminars, rock identification in hand sample, and microscopy lab) are taught in 2h sessions in small groups (15 students or less) on Wednesdays afternoon. The 2-day field trip is usually arranged for the first or second week of May.

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course will be provided on the first day of class or please refer to the Faculty of Sciences and Earth Sciences Department websites (<https://ciencias.unizar.es>, <https://cienciatierra.unizar.es>) and Moodle (<https://moodle2.unizar.es/add/>).

4.5. Bibliography and recommended resources

<http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=26422>