

Academic Year/course: 2022/23

26414 - Sedimentary Processes and Environments

Syllabus Information

Academic Year: 2022/23

Subject: 26414 - Sedimentary Processes and Environments

Faculty / School: 100 - Facultad de Ciencias

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

ECTS: 9.0

Year: 2

Semester: Annual

Subject Type: Compulsory

Module:

1. General information

1.1. Aims of the course

Main objectives of the course are:

1. To understand the sedimentary processes and their control in sedimentary production and accumulation.
2. To decipher sedimentary processes from the analysis of texture and sedimentary structures of sediments and sedimentary rocks.
3. To describe present sedimentary environments and their sedimentary processes and deposits.
4. To study facies sequences and facies models of sedimentary successions in the geol

2. Learning goals

2.2. Learning goals

Upon passing the course, the student will be competent in:

1. Explaining and relating the different concepts, models and hypothesis of the Sedimentology.
2. Recognizing the different types of sediments and sedimentary rocks and interpreting their genetic processes and sedimentary environments.
3. Analysing the information related to facies analysis and their applications.

3. Assessment (1st and 2nd call)

3.1. Assessment tasks (description of tasks, marking system and assessment criteria)

3.1. Continuous assessment

Continuous assessment includes the following assessment activities (to pass the course a 5/10 mark is required in all the assessment activities):

1. Theory exam (60% of the final mark), including:
 - First part (65% of the final mark of the theory): Theory exam of Module 1 (Sedimentary processes) and Module 2 (Continental sedimentary environments) developed during the 1st four-month period.
 - Second part (35% of the final mark of the theory): Theory exam of Module 3 (Transitional and marine sedimentary environments) developed during the 2nd four-month period.
2. Laboratory practices (20% of the final mark), including the assessment of both the attendance to practices and the correction of the practices and related exercises.
3. Fieldwork (10% of the final mark), including the assessment of both the attendance to practices and the correction of the

field notes and related exercises. This activity is mandatory (see Art. 9.1, 22th December 2010 "Reglamento de Normas de Evaluación del Aprendizaje", University of Zaragoza).

4. Seminar (10% of the final mark), including the assessment of the oral presentation of the seminar and the answer to questions asked by the teachers and students.

3.2. Global assessment

Global assessment includes:

1. Theory exam, with similar structure and criteria than the continuous assessment.
2. Practice exam of laboratory practices. See also requirements for fieldwork assessment in 3.1.
3. Seminar, similar than that described in 3.1.

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, laboratory sessions and fieldwork.

The main objective of the course is the description and the interpretation of present and ancient sedimentary environments. The course is developed using some descriptive concepts seen in the previous course "Stratigraphic analysis", but including detailed descriptive and interpretive concepts concerning facies and sedimentary processes and environments. By means of individual and team works, the students will improve their knowledge and ability to work on fields such as Stratigraphy, Sedimentology and Basin analysis.

4.2. Learning tasks

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

Lectures (40 hours)

Laboratory sessions (20 hours). Ten sessions, 2 hours each.

Fieldwork (30 hours). It includes 6 daylong field trips.

Autonomous work and study (126 hours). This section includes the oral presentations of seminars (see 3.1. and 4.3). Working teams (up to 2 members) and choice of topic will be established at the beginning of the course. Each team will explain the obtained results in a 10-minutes-long oral presentation in April.

Exams (9 hours).

Note: 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 recommended it.

4.3. Syllabus

This course will address the following topics:

1. Lectures

Module 1. Sedimentary processes?

- 1.1. Sedimentary environments and Sedimentology
- 1.2. Facies analysis
- 1.3. Sedimentary processes: transport-sedimentation interaction

Module 2. Continental sedimentary environments?

- 2.1. Alluvial fans
- 2.2. Fluvial environments
- 2.3. Lake environments
- 2.4. Aeolian environments
- 2.5. Glacial environments

Module 3. Transitional and marine environments

- 3.1. Introduction: from coast to deep sea
- 3.2. Tidal flats
- 3.3. Beaches and barrier inlands
- 3.4. Deltas and estuaries
- 3.5. Continental platforms
- 3.6. Carbonate buildups
- 3.7. Continental slope and deep-sea environments

2. Laboratory practices?

Module 1. Sedimentary processes?

Practice 1. Granulometric analysis

Practice 2. Palaeocurrent analysis

Module 2. Continental sedimentary environments?

Practice 1. Genetic analysis of sedimentary structures

Practice 2. Sequential analysis

Practice 3. Interpretation of sedimentary logs in continental sedimentary environments

Module 3. Transitional and marine environments

Practice 1. Genetic analysis of carbonate rocks

Practice 2. Interpretation of sedimentary logs in transitional and platform sedimentary environments

Practice 3. Genetic analysis of present carbonate sediments

Practice 4. Interpretation of sedimentary logs in continental slope and deep-basin environments

3. Fieldwork.

Analysis of Mesozoic and Cenozoic sedimentary successions outcropping in the Iberian Chain, Pyrenees and Ebro Basin, including:

Module 1. Analysis of processes, deposits, facies and sequences in continental sedimentary environments (3 days).

Module 2. Analysis of processes, deposits, facies and sequences in transitional and marine sedimentary environments (3 days).

4. Oral presentation of the seminars.

4.4. Course planning and calendar

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.

4.5. Bibliography and recommended resources

<http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=26414>