

26429 - Basin Analysis

Syllabus Information

Academic Year: 2021/22

Subject: 26429 - Basin Analysis

Faculty / School: 100 - Facultad de Ciencias

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

ECTS: 5.0

Year: 4

Semester: First semester

Subject Type: Optional

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, practice sessions and fieldwork.

The course consists of three complementary parts: theory, laboratory practice and field practice. The proposed activities are based on the transmission of basic and essential knowledge through participatory teaching master classes. This knowledge is successive in the order of learning and is supplemented by exercises and field activities in which the student demonstrates the degree of understanding and application of concepts, methods and analytical and descriptive used techniques. In addition, the tutorials are a complementary activity in which the student can consult or complete issues it deems appropriate. Finally, students can access various materials related to the subject through the ADD.

For all this we have designed a work schedule that allows addressing the different training aspects with a balanced workload throughout the course.

4.2. Learning tasks

This course is organized as follows:

- **Lectures** (25 hours). Participatory lectures.
- **Laboratory** (15 hours). 7.5 sessions of 2 hours each.
- **Fieldwork** (1 ECTS). It involves 3 trips.
- **Autonomous work and study** (73 hours).
- **Exams** (2 hours).
- **Tutorials**

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.

4.3. Syllabus

This 5 ECTS (125 hours) course will address the following topics:

Lectures

- **Topic 1.** Introduction to the Basin Analysis
 - Concept and objectives
 - Sedimentary basins in their geodynamic context
 - Plate Tectonics and Wilson cycle
 - Main basin analysis techniques
- **Topic 2.** Factors of control of Sedimentary Filling
 - Subsidence
 - Eustasy
 - Sediment supply
- **Topic 3.** Sedimentary basins: types
 - Classification criteria of sedimentary basins
 - Adopted classification:
 - Basins formed by extension of the lithosphere
 - Basins formed by flexure of the lithosphere
 - Basins associated with directional faults
- **Topic 4.** Modeling of Sedimentary Basins Infilling
 - Introduction to the modelling of sedimentary basins
 - Software for modelling of sedimentary basins

Laboratory sessions

- **Section 1.** Tools in basin analysis
- **Section 2.** Calculation of subsidence. Geohistorical analysis
- **Section 3.** Calculation of denudation rates. Evolution of the source area
- **Section 4.** Fischer diagrams for recognition of sedimentary cycles

Fieldwork are organized in 3 thematic blocks:

- **Section 1.** Recognition and study of different types of sedimentary basins in a cross Almazan Basin-Cameros Basin-Ebro-Basin (1 day)
- **Section 2.** Tectonics-sedimentation relationships in the Ebro Basin (1 day)
- **Section 3.** Jaca Basin (1 day)

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=26429>