

Academic Year/course: 2022/23

26417 - Stratigraphic Correlation and Synthesis

Syllabus Information

Academic Year: 2022/23

Subject: 26417 - Stratigraphic Correlation and Synthesis

Faculty / School: 100 - Facultad de Ciencias

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

ECTS: 7.0

Year: 3

Semester: First semester

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, laboratory sessions, fieldwork and tutorials.

4.2. Learning tasks

This 7 ECTS course is organized as follows:

- **Lectures and seminars** (30 hours). Participatory sessions through which basic knowledge is transmitted. Seminars will address some relevant aspects to complement laboratory sessions and fieldwork. Different useful material related to the course will be available in the online learning platform (Moodle).
- **Fieldwork** (4 days). 20 hours. In the field trips, students will obtain the necessary data that later will be analyzed in laboratory sessions. They will demonstrate the degree of understanding of the course as well as a correct application of concepts, methods and techniques used.
- **Laboratory sessions** (20 hours). 10 sessions in which students will analyze data obtained in the fieldwork.
- **Autonomous work and study**
- **Tutorials**. Students can attend tutorials in order to ask questions about any course content.
- **Exam** (7 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:

- **Facies distributions and sedimentary architecture.** Walter's law. Geometry of sedimentary bodies. Lateral terminations of the strata and facies. Facies aggradation, retrogradation and progradation. Geometric relationships: onlap and offlap; top lap and downlap.
- **Correlation and sedimentary discontinuities.** Concept and types of correlation. Classification of discontinuities. Discontinuities in the marine and continental environment. Angular, progressive and cartographic unconformities. Chronostratigraphic restorations: erosional gap and sedimentary hiatus.
- **Accommodation and sedimentary cycles.** Accommodation concept. Control factors in the filling of basins (subsidence, eustasia and sedimentary supply): interaction of climate and tectonics. Transgressions and regressions. Sedimentary cycles: orders and subdivision.
- **Depositional sequences and systems tracts.** Seismic and sequence stratigraphy. Comparison with the T/R cycle. Systems tracts in carbonate and siliciclastic platforms, in coastal plains and in continental systems.
- **Syntectonic sedimentation.** Syntectonic deposits in compressive and extensive basins. The tectosedimentary analysis. The tectosedimentary units (UTS): application to continental basins. Syntectonic units in coastal and marine environments.
- **Parasequences and orbital cycles.** High frequency sequences (parasequences). The record on shallow platforms: the Fischer diagram. The record in the continental environment and in the deep marine environment.
- **Stratigraphic events and correlation.** Concept and types of events: correlation potential. Deposits in relation to tectonic and sedimentary events. Bioevents and anoxic events
- **Stratigraphic synthesis maps.** Facies maps. Isopach maps. Structural contour maps. Paleogeographic maps. Palinspastic reconstructions.
- **Sedimentary Basins:** Basic concepts. Extensional, compressional and pull-apart basins

Laboratory sessions

The sessions are organized in order to work and solve questions about the cases that have been previously visited and introduced in the field. Each case is assigned one or two sessions of two laboratory hours. This program includes the resolution of up to 9 case studies. The topics covered by the laboratory sessions deal with the following topics:

- Correlation of sedimentary successions from distributions of facies and discontinuities in continental, coastal and marine environments. Preparation of maps of facies distributions.
- Analysis of marine, transitional and continental environments
- Reconstruction of sedimentary architecture in terrigenous and carbonate systems.
- Reconstruction of sedimentary basins: preparation of isopaque maps.

Fieldwork

- **Trip 1.** Correlation, discontinuities and lateral facies relationships in continental and coastal mixed to terrigenous successions
- **Trip 2.** Correlation, discontinuities, and lateral facies relationships in marine carbonate shelf/slope systems and in reef systems
- **Trip 3.** Systems tracts and sea level variations: Application to coastal and marine shelf-slope systems
- **Trip 4.** Parasequences and syntectonic deposits in continental and coastal units

4.4. Course planning and calendar

- Exam: the start time and duration of the global test will be established in the schedule of exams of the Sciences Faculty and announced at least 3 days in advance in the ADD and the bulletin board of the Stratigraphy Area.
- Fieldwork trips will be scheduled in coordination with lectures and laboratory sessions.

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://biblos.unizar.es/br/br_citas.php?codigo=26417&year=2020