

## 60433 - Paleontology and dynamics of the biosphere

### Syllabus Information

**Academic Year:** 2019/20

**Subject:** 60433 - Paleontology and dynamics of the biosphere

**Faculty / School:** 100 - Facultad de Ciencias

**Degree:** 541 - Master's in Geology: Techniques and Applications

**ECTS:** 5.0

**Year:** 1

**Semester:** Second semester

**Subject Type:** Optional

**Module:** ---

### 1.General information

#### 1.1.Aims of the course

#### 1.2.Context and importance of this course in the degree

#### 1.3.Recommendations to take this course

### 2.Learning goals

#### 2.1.Competences

#### 2.2.Learning goals

#### 2.3.Importance of learning goals

### 3.Assessment (1st and 2nd call)

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

### 4.Methodology, learning tasks, syllabus and resources

#### 4.1.Methodological overview

The methodology followed in this course is aimed at achieving the learning objectives. The course is divided into three sets of topics and a seminar. Students are expected to participate actively in the class throughout the semester. The materials for the classroom will be available through Moodle and [www.aragosaurus.com](http://www.aragosaurus.com). These include a deposit of the class notes used in class, the course program, as well as other course-specific learning materials, including a discussion forum. More information about the course will be provided on the first day of class.

The learning process that has been designed for this subject is based on the following: paleontological record in the past, shape analysis, evolution of fossil associations and paleoenvironmental, paleoecological and paleobiogeographic inferences.

The course has a workload distributed in the following methodologies:

- 1. Theory sessions (1.9 ECTS): detailed discussion of the issues with the help of ICT and active participation of students.
- 2. Laboratory sessions (2.8 ECTS): application of various techniques for solving problems based on real or potential cases, use of general or specific software.
- 3. Seminar (0.3 ECTS): discussion of the proposed topic.

In order to optimize the coordination between theory and practice, the course is taught in intensive four-hour sessions that will mix the introduction of the key theoretical aspects with their application.

#### 4.2.Learning tasks

Paleontology and dynamics of the biosphere is a 5 ECTS credit course, consisting of 50 hours of theory and practice sessions distributed throughout the second semester. At the end of the course a seminar will be held in which students are given the opportunity to interact with terrestrial biosphere researchers working in other fields. The practice sessions consist on solving both simple and more complex problems related to the theoretical core concepts previously introduced.

### 4.3.Syllabus

**The syllabus offered to the student to help him achieve the expected results includes the following activities.**

#### **Topic 1: Contributions of paleontology to the knowledge of the biosphere**

- 1.1. Contributions of paleontology to the knowledge of the biosphere and its dynamics: a historical perspective.
- 1.2. The phenomenon of life on Earth
- 1.3. The origin of life: the interpretation of the fossil record

#### **Topic 2: The evolution of the shape of organisms**

- 2.1. Diversification and morphological and ecological disparity. Environmental change and natural selection in paleontology. Coevolution.
- 2.2. Phylogenetic inference and its application in Paleobiogeography

#### **Topic 3: The study of palaeobiodiversity**

- 3.1. Contributions of taphonomic analysis on the correct interpretation of the fossil record and analysis of the palaeobiodiversity.
- 3.2. Geosphere and Biosphere: impact of the organisms in the ecosystems of the past and in the fossil record.
- 3.3. Biosphere response to environmental perturbations at regional and global scale.
- 3.4. Periodicity on a geological scale of biotic events.
- 3.5. Using paleontological data banks in the study of biodiversity and its dynamics.
- 3.6. Contributions in the fields of Evolutionary ecology, Macroecology and Historical Biogeography.

#### **Seminar**

- Contributions of Paleontology in the field of astrobiology

### 4.4.Course planning and calendar

#### **Calendar of face-to-face sessions and presentation of works**

**The subject will be taught in theoretical-practical sessions lasting 3-4 hours on Mondays in the morning. The definitive schedules can be consulted on the website of the Faculty of Sciences.**

More information will be given on the class boards and in the Teaching Digital Ring (<https://moodle2.unizar.es/add/>) or on the website aragosaurus (<http://www.aragosaurus.com/>) when available of this information.

Classes begin in the second semester in February, according to the calendar that is published on the website of the faculty.

Dates of exams at the end of the classes, according to the calendar that is published on the website of the faculty.

The practical classes will begin in the second week of classes to synchronize theory-practice.

### 4.5.Bibliography and recommended resources

[http://biblos.unizar.es/br/br\\_citas.php?codigo=60433&year=2019](http://biblos.unizar.es/br/br_citas.php?codigo=60433&year=2019)