

Academic Year/course: 2022/23

## 26438 - Technics in Paleontology

### Syllabus Information

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**Academic Year:** 2022/23

**Subject:** 26438 - Technics in Paleontology

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

**Degree:** 296 - Degree in Geology

588 - Degree in Geology

**ECTS:** 5.0

**Year:** 4

**Semester:** Second semester

**Subject Type:** Optional

**Module:**

## 1. General information

### 1.1. Aims of the course

The main objective of the subject "Technical paleontology" is to provide the student with knowledge and skills to tackle any professional paleontological problem.

The starting point is that students already know how to find and study fossils from different groups. In addition, they have knowledge on paleobiology, paleoecology, biostratigraphy, systematics, etc., areas that are traditionally related to the basic investigation. From this conceptual base, the general objective of the course is to offer the tools necessary for the geologist to solve technical questions related to Paleontology. The subject has a theoretical part because it is necessary to teach content that does not exist in other subjects; however the practicals are essential for students to acquire the necessary skills. For example, students will spend time preparing real fossils or designing a paleontological exhibition.

These approaches and objectives are aligned with the following United Nations Sustainable Development Goals (SDGs) (<https://www.un.org/sustainabledevelopment/>), in such a way that the acquisition of the results of Learning the subject provides training and competence to contribute to some extent to its achievement:

Goal 13 Climate Action

Goal 14 Life Below Water

Goal 15 Life On Land

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

"Technical paleontology" aims to cover the training of Geology students in a subject that is not covered in any of the other subjects of the Geology degree at the University of Zaragoza. In recent years, a wide niche of professional Paleontology jobs has been developed: prepare fossils in the lab using a wide range of techniques, design paleontological exhibitions, excavations and preventive surveys, administration, etc.

### 1.3. Recommendations to take this course

This course introduces students to technical and professional paleontology. It is recommended that the student has previously studied other paleontological courses, since general concepts on Paleontology will be used.

Taking into account the novelty of this subject in terms of its contents, the laboratory practices are particularly important to learn various paleontological techniques.

## 2. Learning goals

### 2.1. Competences

When pass the subject, students will be more competent to ...

Know the applications, techniques and professional opportunities of Paleontology.  
Give technical advice on projects, conservation and management of paleontological heritage.  
Implement projects on technical management of paleontological excavations.  
Use the appropriate field and laboratory techniques typical of the different paleontological groups.  
Manage data processing programs, statistics, drawing, etc. and image analysis.  
Manipulate and curate fossil collections.  
Provide professional advice on Technical Paleontology, including exhibition projects for museums, and protection of paleontological heritage.  
Learn skills to work with ocean drilling cores and carry out paleoceanographic studies.  
Apply paleontological techniques in studies of environmental conservation and pollution.

## 2.2. Learning goals

In order to pass this subject, the student must be able to:

Make appropriate decisions to design and carry out fossil preparation and curation.  
Design and carry out a technical paleontology project.  
Highlight the significance of -and protect- the paleontological heritage.  
Design the management of a paleontological collection.

## 2.3. Importance of learning goals

In recent years, paleontological exhibitions, museums, websites and companies have proliferated, many of them managed and / or designed by geologists specialized in Paleontology. Training in Paleontology allows the geologist to expand his work panorama in a significant way. Students who have completed this subject they will be able to understand, organize and develop professional projects on Paleontology, from field work to cabinet work, value the paleontological heritage and participate in its protection plans.

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

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

- Assessment of the theoretical-practical part of the subject:

- Continuous assessment of laboratory classes and fieldwork, and a theoretical-practical exam ; or
- A global theoretical-practical evaluation test at the end of the course, on the dates proposed by the Faculty. This test will include short questions, open questions and exercises/problems similar to those addressed in the laboratory and during field work campaigns.

- In addition, the students will carry out a personal project to create a paleontological exhibition in a museum. This project will be presented and defended in class, followed by an open discussion.

### Evaluation and Qualification Criteria

The assessment and rating of the different activities will be conducted using the following criteria:

- The theoretical-practical part will account for 70% of the overall grade. For those students who choose the continuous assessment, this grade will be calculated from the theoretical-practical exam (35%) and the laboratory and fieldwork activities (35%), being necessary to pass both parts.
- Personal project on a paleontological display for a museum: 30% of the global qualification.

# 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, seminars, fieldwork and tutorials.

The course is eminently practical, and the proposed activities are aimed at the understanding and the assimilation of content from personal experience (?Hands-on?). The knowledge acquired in lectures is complemented by practical laboratory activity and seminars, where the student will learn and demonstrate methods and analyses, and their application. In personal work, the student must demonstrate the ability to investigate, present and defend a report on subjects related to technical Paleontology.

For better monitoring of the learning process, students will be encouraged to use the tutorials through various systems and methods: conventional tutorials, more specific tutorials related to practical work-type seminar, and the possibility of carrying out telematic tutorials.

## 4.2. Learning tasks

This course is organized as follows:

- **Lectures** (1,4 ECTS: 14 hours)
- **Laboratory** (1,55 ECTS: 15,5 hours).
- **Case studies and seminars.** (0.8 ECTS: 8 hours)
- **Fieldwork** (1,25 ECTS: 12,5 hours) 2,5 days.

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 course will address the following topics:

### Lectures

- Introduction. The professionalization of Palaeontology. The role of a palaeontologist in companies, as freelance, or as a technician in the administration and in museums.
- Paleontological techniques I. Field work. Prospecting, sampling and collection of fossils. Excavation and documentation techniques.
- Paleontological techniques II. Laboratory work. Fossils reconstruction, conservation and documentation.
- Museum techniques in Palaeontology. Paleontological heritage.
- Management of collections. Documentation and storage techniques. Special collections.
- Techniques to work with fossils from ocean cores.
- Techniques in molecular palaeontology and organic biomarkers.
- Paleontological techniques applied to environmental monitoring (water quality, pollution). Applications of Palaeontology in criminalistics and forensic sciences.

### Laboratory sessions

- Paleontological techniques in the laboratory: macrofossil reconstruction, preparation and conservation.
- Palaeontology in the museums: techniques.
- Management of collections.
- Moulds of macro and microfossils.
- Digitalization techniques.

### Case studies and seminars

- Seminars for essay presentations.
- Paleontological techniques applied to exploration of geological resources, oceanographic studies, and environmental monitoring. Techniques to work with ocean cores.

### Fieldwork

- Advanced field work techniques: fossil prospection, sampling and collection. Coring and excavation techniques.

## 4.4. Course planning and calendar

- Theoretical lectures: Wednesday and Thursday from 11:00 to 12:00 throughout the second semester.
- Practical sessions: Wednesday from 12:00 to 14:00.

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 website (<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=26438&year=2020](http://biblos.unizar.es/br/br_citas.php?codigo=26438&year=2020)

