

Academic Year/course: 2022/23

## 26421 - Micropalaeontology

### Syllabus Information

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**Academic Year:** 2022/23

**Subject:** 26421 - Micropalaeontology

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

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

**ECTS:** 6.0

**Year:** 3

**Semester:** Second semester

**Subject Type:** Compulsory

**Module:**

## 1. General information

### 1.1. Aims of the course

The 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:

-Goal13: Climate Action

-Goal14: Life Below Water.

## 2. Learning goals

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

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

1. Theory exam: 30% (to assess the student's knowledge of the course content, a mark of at least 5 is required in 10-scale grading system)?
2. Coursework: 70% (Practice session exams, 30%; field trip report 10%; Micropaleontological sample analysis report 30%)

## 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 autonomous work and study. Students will learn and practice the micropaleontological techniques. The most relevant microfossil groups in applied micropaleontology will be studied and interpreted in terms of biostratigraphy and paleoenvironmental, paleoclimatic and paleoceanographic reconstruction. Introduction to the scientific research by means of the study of a micropaleontological sample.

### 4.2. Learning tasks

This 6 ECTS course is organized as follows:

1. Lectures (25 hours). Two weekly hours. Students are expected to participate actively in class.
2. Laboratory sessions (30 hours). 2.5 weekly hours. It involves the study of a micropaleontological sample for the practical assignment.

3. Fieldwork (0.5 ECTS: 5 hours). At Arguis-Monrepós, Huesca.
4. Exam (6 hours).
5. Autonomous work and study (84 hours). It comprises the study of theory and the completion of the practical assignment.

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

##### Section I: Fundamentals of the Micropaleontology

- Topic 1. Concept, history and methods of the Micropaleontology.
- Topic 2. Taphonomy and micropaleontological classification.

##### Section II: Main micropaleontological groups

- Topic 3. Foraminifers (biological introduction and organization of the shell).
- Topic 4. Planktic Foraminifera (Globigerina).
- Topic 5. Small benthic foraminifera of Lagenina and Rotaliina.
- Topic 6. Large benthic foraminifera of Rotaliina and Miliolina.
- Topic 7. Small and large benthic foraminifera of Fusulinina and Textulariina.
- Topic 8. Radiolaria
- Topic 9. Tintinnids and calcareous nannofossils (coccolithophorids).
- Topic 10. Diatoms and silicoflagellates
- Topic 11. Dinoflagellates, acritarchs, quaternary, and calcareous algae.
- Topic 12. Bryozoa and ostracods.
- Topic 13. Other microfossils of protists and invertebrates.
- Topic 14. Conodonts and other microfossils of vertebrates.

##### Section III: Applications of the Micropaleontology

- Topic 15. Paleoecology and paleoenvironmental reconstruction using microfossils.
- Topic 16. Environmental micropaleontology
- Topic 17. Paleoclimatology using microfossils.
- Topic 18. Paleooceanography using microfossils.
- Topic 19. Paleobiogeography using microfossils.
- Topic 20. Biostratigraphy. Limits and advantages of microfossils.
- Topic 21. Methods of stratigraphic correlation using microfossils.
- Topic 22. Evolutionary paleobiology using microfossils (evolution and extinction).
- Topic 23. Reconstruction of paleobiological, paleoclimatic and paleooceanographic events using microfossils.
- Topic 24. Origin and history of the life during the Precambrian through microfossils. Astrobiology using microfossils.
- Topic 25. Analysis of microfossils (solving of case studies).
- Topic 26. Solving of problems and case studies with microfossils.

#### Laboratory sessions

Learning and training in the micropaleontological techniques. Identification of the most useful microfossils and their application to the solution of biostratigraphic, paleoecological and evolutionary problems. Study of a micropaleontological sample, as practice individual research, during the second half of each practical session.

Session 1. Microfossils. Basic paleoecology, taphonomy and biostratigraphy.

Session 2. Planktic foraminifera. Basic paleoclimatology.

- Session 3. Lagenina and Rotaliina. Basic paleoenvironmental reconstruction.
- Session 4. Miliolina, Fusulinina and Textulariina.
- Session 5. Analysis of microfacies.
- Session 6. Laboratory methods. Delivery of micropaleontological sample.
- Session 7. Micro- and nannofossils of protists (calcareous, siliceous and organic).
- Session 8. Ostracods, bryozoa and other invertebrate microfossils.
- Session 9. Conodonts and vertebrate microfossils.
- Session 10. Study of micropaleontological sample.
- Session 11. Study of micropaleontological sample.
- Session 12. Study of micropaleontological sample.

#### **Fieldwork**

Field trip to Arguis-Monrepós (Huesca)

#### **4.4. Course planning and calendar**

This course is a second semester course. Classes will start the first academic week and will last for 13 weeks.

-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=26421>