COURSE DATA

DATA SUBJECT

Code: 46741
Name: Sedimentary environments and fossil record
Cycle: Master's Degree
ECTS Credits: 3
Academic year: 2025-26

STUDY (S)

Degree	Center	Acad. year	Period
2266 - Master's Degree in Applied Palaeontology	Facultat de Ciències Biològiques	1	First quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
2266 - Master's Degree in Applied Palaeontology	Advanced scientific training	ELECTIVES

COORDINATION

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SUMMARY

The objective of this subject is the basic training of the student in the contextualization of the fossil record within the framework of sedimentary environments, both current and the geological record. The starting point consists of the spatial-temporal arrangement of rocks and sediments. The second place illustrates the basic keys that define the paleoenvironmental parameters archived in the sediments and rocks. In this area, special attention is paid to the content of fossil organisms in the different sedimentary environments. Finally, this subject aims to provide training in the most common techniques and procedures for field and laboratory work.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

There are no specified enrollment restrictions with other subjects of the curriculum.

OTHER REQUIREMENTS

There are no enrollment restrictions with other subjects in the curriculum.

COMPETENCES / LEARNING OUTCOMES

2266 - Master's Degree in Applied Palaeontology

Access information tools from other areas of knowledge and use them appropriately.

Access the necessary information in the specific field of the subject (databases, scientific articles, etc.) and have sufficient judgement to interpret and use it.

Apply critical reasoning and argumentation based on rational criteria.

Apply science from a social and economic point of view, promoting the transfer of knowledge to society.

Apply the knowledge acquired and problem-solving abilities in new or unfamiliar situations within broader (or multidisciplinary) contexts related to the field of study.

Apply the research experience acquired to initiate the research phase of a PhD programme on biodiversity-related topics.

Apply the research experience acquired to tasks specific to the profession, both in the private sector and in public institutions.

Assess the need to complement their scientific, historical, language, IT, literature, social and human ethics education by attending lectures or courses and/or carrying out complementary activities, self-evaluating the contribution that these activities make to their overall education.

Assume an ethical commitment and sensitivity towards environmental problems and natural and cultural heritage.

Collect, represent and analyse data for the interpretation and production of geological maps and/or other forms of representation (stratigraphic columns, geological cross-sections, etc.) with a view to their inclusion in reports, scientific publications or other outputs.

Communicate and popularise scientific ideas.

Communicate conclusions and the knowledge and rationale supporting them to specialised and non-specialised audiences clearly and unambiguously.

Continue the learning process in a manner that is largely self-directed or independent.

Demonstrate in-depth understanding of the historical nature of the evolutionary process, both in its aspects of unrepeatability and contingency and in those linked to the fulfilment of laws of nature of all kinds and, therefore, of necessity.

Demonstrate intellectual curiosity and encourage responsibility for one's own learning.

Have an in-depth knowledge and understanding of the nature of biodiversity and its ecosystemic relationships both now and in the past.

Integrate knowledge and confront the complexity of making judgements based on information that, although incomplete or limited, includes reflections on the social and ethical responsibilities linked to the

application of knowledge and judgements.

Know, understand and draw conclusions, applicable to the present time, about the crises of biological diversity, and their causes and consequences within the framework of actualism.

Know and understand the palaeodiversity of living beings, their ecosystemic relationships and the palaeogeographical distribution achieved by the main groups of living beings throughout the Earth's history.

Make quick and effective decisions in complex situations in their professional or research work, by developing new and innovative work methodologies adapted to the scientific/research, technological or professional field in which they carry out their activity.

Plan and manage available resources, taking into account the basic principles of quality, risk prevention, safety and sustainability.

Prepare, write and present reports and projects in public in a clear and coherent manner, defend them with rigour and tolerance and respond satisfactorily to any criticism that may arise from the presentation.

Produce all types of reports related to palaeontological matters clearly and concisely at an official or professional level (reports, grants, heritage impact reports, research projects, etc.)

Skillfully handle the field, laboratory and office techniques for the extraction, preparation, cataloguing, digital reconstruction, study and dissemination of microfossils and macrofossils.

Understand the fundamental principles of facies analysis in continental, transitional and marine depositional systems, and the use of fossils for palaeoenvironmental interpretation of the stratigraphic record.

Understand the nature of the fossil record in relation to the sedimentary process, the biostratinomic and phosildiagenetic phases of the process and the mechanisms of fossilisation.

Understand the nature of the stratigraphic record, its discontinuities, cycles and events, the different types of sedimentary basins, the factors controlling their infilling, the resulting three-dimensional geometries and stratigraphic correlations.

Use acquired knowledge as a basis for originality in the development or application of ideas, often in a research context.

Work efficiently in a professional or research team, acquiring the ability to participate in research projects and scientific or technological collaborations.

DESCRIPTION OF CONTENTS

1. Basic concepts of stratigraphy.

Descriptive and interpretive stratigraphy. Sedimentary processes and their record. Sedimentary environments and their fossil record. Facies models of continental, transitional and marine depositional systems

2. Analysis techniques of the stratigraphic and sedimentological record.

Data acquisition procedures both in outcrops of different scale. Survey of stratigraphic and sedimentological series. Recognition of sedimentary structures in the field. Laboratory techniques applied to the study of lutitic, detrital and carbonate sediments.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Theory	10,00
Laboratory	5,00
Classroom practices	15,00
Total hours	**30,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	0,00
Independent study and work	0,00
Preparation of lessons	0,00
Preparation for assessment activities	0,00
Resolution of case studies	0,00
Total hours	**0,00**

TEACHING METHODOLOGY

The achievement of the objectives of the subject is achieved through three directly related teaching methodologies:

Theoretical classes:

Based on the master class complemented by posing practical questions that are solved in class as group tutorials. Based on lectures and debate sessions on the topics that appear in the program of theoretical classes.

Laboratory practice classes:

Development of practices in working groups with development of the various sedimentological

techniques used in the analysis of current sedimentary facies and their fossil record.

Field practice classes:

Field work on the main aspects seen during the theoretical sessions. Based on a guided itinerary through different enclaves relevant for their stratigraphic and sedimentological features, as well as their fossil record. It also includes the survey of detailed stratigraphic sessions.

EVALUATION

The evaluation of the theoretical and practical aspects of the subject will be carried out through a theoretical exam, an oral presentation on a related topic on a sedimentary environment and its fossil record, as well as the delivery of a report of field and laboratory practices according to with the following weighting:

Evaluation activities

Final test 40%

Field and laboratory practice report 20%

Oral presentation on chosen topic 40%

REFERENCES

- Nichols, Gary (2009). Sedimentology and stratigraphy. Oxford : Blackwell Science, 2009. - Arche, Alfredo (ed. lit.) (2010). Sedimentología: del proceso físico a la cuenca sedimentaria. Madrid : CSIC, 2010. - Vera, J.A (1994): Estratigrafía. Principios y métodos. Ed. Rueda.

- Reading, H. G. (ed.). 1996. Sedimentary environments: processes, facies and stratigraphy. Oxford : Blackwell Science, 1996. - Stow, Dorrik A.V. (2005). Sedimentary rocks in the field : a colour guide. London: Manson Publishing.