COURSE DATA

DATA SUBJECT

Code: 46735
Name: Biostratigraphy
Cycle: Master's Degree
ECTS Credits: 3
Academic year: 2026-27

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	Fundamentals of palaeontology	COMPULSORY

COORDINATION

MARTINEZ PEREZ CARLOS

SUMMARY

The course Biostratigraphy shows the basic principles of the biostratigraphic method focused on the geochronological interpretation of the fossil record. This approach will emphasize the relevance of geological, taxonomic, sampling, taxonomic and biostratigraphic aspects. Within the latter, it is especially relevant to distinguish between biostratigraphic and biological events, to know the different biostratigraphic units, to understand the concept of biozone and the methods to define biozones. The presentation of the graphical correlation method that allows the integration of data to refine correlations is also emphasized. Finally, the construction of the International Stratigraphic Chart will be analyzed, which is the world reference system we have in Geology to relate all events and events in the history of the Earth. The fieldwork will be integrated and coordinated with other subjects of the Master, such as Micropaleontology, Paleobiodiversity and Fieldwork in Paleontology-

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 of the curriculum. However, it is advisable to have a minimum knowledge of Zoology, Botany and Ecology, as well as general Geology and Paleontology.

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.

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

Be familiar with, develop and manage georeferenced databases of elements from the geological and palaeontological record, as well as the software used for the spatial representation and analysis of these elements.

Communicate and popularise scientific ideas.

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

Conduct studies, applying the methods and techniques needed to preserve and manage palaeontological heritage.

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.

Demonstrate knowledge and understanding of the legal foundations for the protection and conservation of palaeontological heritage at the level of the EU, Spain and the Spanish Autonomous Communities.

Develop experimental skills in the handling of laboratory material and equipment in palaeontology.

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 confidently handle the divisions of the geological time scale and the biostratigraphic scales constructed from different groups of biota in the fossil record.

Know and understand past biological events, as well as the zonations, in time and space, of biota in order to establish the relative stratigraphic position of sedimentary rocks from different geographical areas.

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.

Learn about the techniques used in museums for the management of palaeontological heritage, identifying, during guided work visits, successful examples in the field of palaeontology (Dinópolis, the Catalan Institute of Palaeontology, the Palaeontological Museum of Elche).

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.)

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. Introduction and basic concepts

Definition and objectives
Historical overview
Fundamentals of biostratigraphy
Utility of fossils in geology

2. Techniques and methods of biostratigraphic correlation

Interpretation of temporal relationships in the fossil record.
Types of biozones
Semiquantitative methods of correlation

3. Basics of chronostratigraphy

Biostratigraphic units and chronostratigraphic units.
The chronostratigraphic scale
Global stratotype boundaries (GSSPs).

4. Scientific and professional applications of biostratigraphy

The biostratigraphic subdivision of the Devonian.
Importance in Petroleum and Natural Gas Geology.

5. Practical development of a biostratigraphic scale

Interpretation of the temporal relationships of the fossil record in a Paleozoic and a Meso-Cenozoic locality.
Local and global correlations.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Theory	10,00
Seminar	2,00
Laboratory	18,00
Total hours	**30,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	10,00
Independent study and work	20,00
Preparation of lessons	5,00
Preparation for assessment activities	5,00
Resolution of case studies	5,00
Total hours	**45,00**

TEACHING METHODOLOGY

- Lectures/lectures
- Practical laboratory sessions
- Practical field sessions
- Resolution of practical cases
- Preparation and presentation of works

EVALUATION

- **Assessment system** **Weighting (%)**
- Theory examination 40
- Practical examination 20
- Attendance and participation 10
- Preparation of a written report 20
- Oral presentation 10

To pass the course you must obtain a minimum grade of 5 (in a0-10 scale) in each of the parts that are evaluated.

REFERENCES

- Murphy, M.A. & Salvador, A. 1999. International Stratigraphic Guide –An Abridged version. Episodes 22 (4), 255-271 - North American Commission on Stratigraphic Nomenclature, 2005. North American Stratigraphic Code. AAPG Bulletin 89 (11), 1547-1591
- Shaw, A.B. 1964. Time in Stratigraphy. McGraw-Hill, New York, 365 pp.
- Johnson, J.G. 1979. Intent and reality in biostratigraphic zonation. Journal of Paleontology 53 (4), 931-942.
- McGowran, B. 1986. Beyond Classical Biostratigraphy. Petroleum Exploration Society of Australia 9, 28-41 - Miller, F.X. 1977. The Graphic Correlation Method in Biostratigraphy. In Kauffman, E.G. and Hazel, J.E. (eds.) Concepts and Methods of Biostratigraphy, 165-168.
- Murphy, M.A. 1977. On time-stratigraphic units. Journal of Paleontology 51 (2), 213-219. - Shaw, A.B. 1969. Adam and Eve, paleontology and the non-objective arts. Journal of Paleontology 43 (5), 1085-1098.
- Valenzuela-Ríos, J.I. 1994. The Lower Devonian conodont Pedavis pesavis and the pesavis Zone. Lethaia 27 (3), 199-207.
- Valenzuela-Ríos, J.I., Slavík, L.; Liao, J-C; Calvo, H.; Hŭsková, A. & Chadimová, L. 2015. The middle and upper Lochkovian (Lower Devonian) conodont successions in key peri-Gondwana localities (Spanish Central Pyrenees and Prague Synform) and their relevante for global correlations. Terra Nova 27, 409-415.