

Palaeontology II

Code: 101048
ECTS Credits: 6

Degree	Type	Year	Semester
2500254 Geology	OB	2	2

The proposed teaching and assessment methodology that appear in the guide may be subject to changes as a result of the restrictions to face-to-face class attendance imposed by the health authorities.

Contact

Name: Carme Boix Martinez
Email: Carme.Boix@uab.cat

Use of Languages

Principal working language: catalan (cat)
Some groups entirely in English: No
Some groups entirely in Catalan: Yes
Some groups entirely in Spanish: No

Other comments on languages

Some material could be in Spanish or English.

Teachers

Enric Vicens Batet
Rafel Matamales Andreu
Marc Furio Bruno
Joan Madurell Malapeira

Prerequisites

Specifically, this subject requires prior knowledge obtained through the following subjects: Life on Earth and Palaeontology I.

Objectives and Contextualisation

Contextualization: The subject "Palaeontology" is subdivided into the units Palaeontology I and Palaeontology II, which are taught, respectively, in the first and second semester of the second year of the Degree in Geology.

Palaeontology II focusses on the fossil record of those groups not taught in Palaeontology I, which include a part of the invertebrates and the microfossils. Their morphology and certain geological applications (biostratigraphy, palaeoecology, palaeobiogeography) will be studied.

Competences

- Display knowledge of the techniques for identifying the principal fossil groups and use them to date and interpret ancient sedimentary environments, and relate them to the history of the Earth.

- Evaluate and carry out the selection and collection of suitable geological samples.
- Learn and apply the knowledge acquired, and use it to solve problems.
- Obtain information from texts written in other languages.
- Process, interpret and present field data using qualitative and quantitative techniques, and suitable computer programmes.
- Process, interpret and present laboratory data using qualitative and quantitative techniques, and suitable computer programmes.
- Recognise theories, paradigms, concepts and principles in the field of geology and use them in different areas of application, whether scientific or technical.
- Synthesise and analyse information critically.
- Work in teams, developing the social skills needed for this.
- Work independently.

Learning Outcomes

1. Apply the principle of overlap and the evolution of species.
2. Carry out a palaeontological sampling and reference it in the local and regional stratigraphic context.
3. Digitally process palaeontological field data.
4. Discern and describe laboratory techniques for studying the different types of fossils and quantify the associated information.
5. Display knowledge of the techniques for identifying the principal fossil groups and use them to date and interpret ancient sedimentary environments, and relate them to the history of the Earth.
6. Learn and apply the knowledge acquired, and use it to solve problems.
7. Obtain information from texts written in other languages.
8. Relate concepts and theories in palaeontology.
9. Synthesise and analyse information critically.
10. Work in teams, developing the social skills needed for this.
11. Work independently.

Content

- Introduction to microfossils: main groups
- Calcareous microfossils and nannofossils
- Siliceous microfossils and nannofossils
- Organic and phosphatic microfossils.
- Calcareous "algae"
- Palynomorphs
- Cephalopods
- Trilobites
- Bryozoans
- Graptolites
- Conodonts

Any changes / adaptations of these contents, as well as of the teaching methodology used, will be announced on the Campus Virtual.

Methodology

Lectures: Students will acquire the necessary scientific-technical knowledge for the course in the lectures.

Laboratory classes: Attending laboratory classes is mandatory; these classes will take place in 2 hour-long sessions per week at the Palaeontology laboratory. Practical classes will consist of the observation of the distinct fossil groups previously presented in the theory classes. Microscopes will be used on small-sized fossils. Students will be introduced to the determination of fossil sections (in rock samples and thin-section). Exercises carried out in laboratory classes or as independent work will be submitted on the dates determined by the lecturers.

Fieldwork: Attendance is mandatory. Students will visit one or more areas to put into practice the knowledge acquired in the lectures and laboratory classes.

Independent activities: students must complement the above activities with personal work and study.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Fieldwork	7.5	0.3	9, 5, 2
Laboratory work	19.5	0.78	9, 1, 6, 5, 4, 2, 7, 3, 8, 11, 10
Lectures	26	1.04	9, 1, 6, 5, 4, 2, 7, 3, 8, 11, 10
Type: Supervised			
Exercises	15	0.6	9, 4, 3
Type: Autonomous			
Personal study and work	75	3	9, 6, 7, 3, 8, 11, 10

Assessment

All students registered on this subject (whether for the first time or not) are required to carry out the same activities (lectures, laboratory classes and field trips) and will be subject to the same assessment criteria:

Exams: They represent 70% of the final grade. These will take place during the course and will include all content covered in lectures, practical classes and the field trip. A minimum mark of 4 is required in each exam to average with the other course grades. Students who have obtained a grade lower than four must present themselves for re-assessment of the tests.

Laboratory classes and field trip. Attending the laboratory classes and field trip is mandatory. Students attending less than 80% of the practical sessions will not be eligible for assessment and will be awarded the grade of *Fail* (0) for laboratory classes. Non-attendance of the field trip on the day established will result in a *Fail* (0) for this activity. There is no re-assessment for the practical exercises or field trip.

A minimum overall grade of 5 is required to pass the subject.

Schedule of the assessment activities

The dates of the assessment activities and the submission of exercises will be published in the Campus Virtual (CV). They may be subject to changes in programming due to unforeseen eventualities. Any modification will be announced through this platform.

Assessment activities will not be permitted for any student at different dates or times to that the ones already established, unless for justified causes duly advised before the activity, and with the lecturer's previous consent. In all other cases, if an activity has not been carried out, this cannot be re-assessed.

Irregularities committed by the student, copy and plagiarism

According to the UAB academic regulations, assessment activities will be qualified with a zero (0) whenever a student commits academic irregularities that may alter such assessment.

Irregularities contemplated in this procedure include, among others:

- the total or partial copying of a test, practical exercise, report, or any other evaluation activity;
- allowing others to copy;
- presenting group work that has not been done entirely by the members of the group;
- presenting any materials prepared by a third party as one's work, even if these materials are translations or adaptations, including work that is not original or exclusively that of the student;
- having communication devices (such as mobile phones, smartwatches, etc.) accessible during theoretical-practical assessment tests (individual exams).

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Exams	70%	4	0.16	9, 1, 6, 5, 4, 2, 7, 3, 8, 11, 10
Field trip	15%	0	0	9, 6, 5, 2, 8, 11, 10
Practical classes	15%	3	0.12	9, 1, 6, 5, 2, 3, 8, 11, 10

Bibliography

Armstrong, H.A., Brasier, M.D. 2005. *Microfossils* (second edition). Blackwell Publishing, Oxford. 296 p. ISBN 0 632 05279 1 Paris. 408 p. (56 Bab)

Black, R.M. 1988. *The Elements of Palaeontology*. Cambridge University Press. Cambridge. 404 p. ISBN 0 521 34836 6 (56 Bla)

Boardman, R.S., Cheetham, A.H., Rowell, A.J. 1987. *Fossil invertebrates*. Blackwell Scientific Publications. Oxford. 713 p. ISBN 0 86542 302 4 (562 Fos)

Caus, E., Serra-Kiel, J. 1992. *Macroforaminífers*. Servei geològic de la Generalitat de Catalunya.

Clarkson, E.N.K. 1979. *Invertebrate Palaeontology and Evolution*. George Allen & Unwin, London. 323 p. ISBN 0 04 560008 2 (562Cla)

Clarkson, E.N.K. 1998. *Invertebrate Palaeontology and Evolution*. 4th ed. Blackwell Science, Oxford. 452 p. ISBN 0 632 05238 4 (562 Cla)

Cowen, R. 2000. *History of Life*. Blackwell Science. Oxford. 432 p. ISBN 0 632 04444 6 (56 Cow)

Doménech, R., Martinell, J., (Martín-Closas, C.) 1996. *Introducción a los fósiles*. Masson. Barcelona. 288 p. ISBN 84 458 0404 9 (56Dom)

Doyle, P. 1996. *Understanding Fossils. An Introduction to Invertebrate Palaeontology*. John Wiley & Sons. Chichester. 409 p. ISBN 0 471 96351 8 (562 Doy)

Foote, M., Miller, A.I. 2007. Principles of Paleontology (third edition). W.H. Freeman and Co. New York. 354 p. ISBN 13 978 0 7167 06137 (56Foo)

Fortey, R. 2006. ¡Trilobites! Laetoli, Pamplona. 308 p. ISBN 84 9348623 X ()

Gallermí, J. (Coordinador). 1988. El registre fòssil. Història Natural dels Països Catalans. T 15. Ed. Enciclopèdia Catalana. 438 p. ISBN84 7739 022 3 ()

Hammer, O., Harper, D.A.T. 2006. Paleontological data analysis. Blackwell Publishing. 351 p. ISBN 1405115440 (56 Ham)

Lethiers, F. 1998. Évolution de la biosphère et événements géologiques. Gordon and Breach Science Publications GIB. 321 p. ISBN 90 5699 124 8 (551 Let)

Levi-Setti, R. 1975. Trilobites. University of Chicago Press. Chicago. 213 p. ISBN 0 226 474488 (562 Lev)

López, N., Truyols, J. 1994. Paleontología. Editorial Síntesis. Madrid. 334 p. ISBN 84 7738 249 2 (56 Lop)

Majewske, O.P. 1974. Recognition of invertebrate fossil fragments in rocks and thin sections. E.J. Brill, Leiden. (562 Maj)

Martínez Chacón, M.L., Rivas, P. 2009. Paleontología de invertebrados. Sociedad Española de Paleontología. Oviedo. 524 p. ISBN 978 84 613 4625 7 (562 Pal)

McGowran, B. 2005. Biostratigraphy. Microfossils and Geological time. Cambridge University Press, Cambridge. 459 p. ISBN 0 521 83750 2 (551 Mcg)

McNamara, K., Long, J. 1998. The Evolution Revolution. Wiley. Chichester. 298 p. ISBN 0 471 97406 4 (56 McN)

Meléndez, B. 1998. Tratado de Paleontología, I. CSIC. Madrid. ISBN 84 00 07790 3 (56 Mel)

Molina, E. (editor) 2004. Micropaleontología (2a edición). Prensas Universitarias de Zaragoza, Zaragoza. 704 p. ISBN 84 7733 744 6 (560 Mic)

Moore, R.C. (Editor, diversos anys, diversos volums) Treatise on Invertebrate Paleontology. Cada grup d'invertebrats es tracta en volums diferents. (es troben normalment al laboratori de pràctiques)

Murray, J.W. 1985. Atlas of invertebrate macrofossils. Ed. Longman. Essex. 241 p. ISBN 0 582 30099 1 (562 Atl)

Palmer, D., Rickards, B. 1991. Graptolites. Boydell Press. Woodbridge. 166 p + 138 pl. ISBN 0 85115 262 7 (562 Gra)

Smith, A.B. 1984. Echinoid Palaeobiology. George Allen & Unwin. London. 190 p. ISBN 0 04 563001 1 (560 Smi)

Smith, A.B. 1994. Systematics and the fossil record. Documenting revolutionary patterns. Blackwell Science. Oxford. 223 p. ISBN 0 63203642 7 (56 Smi)

Smith, A.B., Batten, D.J. 2002. Fossils of the Chalk. Palaeontological Association, London. 374. ISBN 0 901702 78 1 (56 (4) Fos)

Whittington, H.B. 1992. Trilobites. Boydell Press. Woodbridge. 145 p + 120 pl. ISBN 0 85115 311 9 (562 Whi)

WEB SITES

TRILOBITES. www.trilobite.info

AMMONITES. www.ammonites.fr

ICS. International Commission on Stratigraphy. www.stratigraphy.org

PALEOMAP PROJECT. Christoffer R. Scotese. www.scotese.com

RON BLAKE MAPS. Global Paleogeography. <https://deeptimemaps.com/>