

Degree programme	Type	Course
Geology	OB	2

Contact lecturer

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Teaching staff

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Group languages

You can consult this information at the [end](#) of the document.

Prerequisites

This subject requires prior knowledge of:

- Geology
- Biology: fundamentals, taxonomy, microevolution, ecology, biogeography, organisational levels of the living organisms and characteristics of the different groups (knowledge obtained through the subject Life on Earth)

Objectives

Objectives: to know and understand the fossil record in order to use it properly for the resolution of geological problems, whilst also taking into account its contribution to fundamental aspects of biology.

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.

Some general Palaeontology subjects and certain groups of the fossil record are taught in Palaeontology I. Specifically, those that (1) are most useful for illustrating the concepts of general palaeontology and/or (2) are less complex and/or (3) are considered essential for the student to know but cannot be studied in fuller detail.

The fossil record of the groups that (1) are considered most complex and/or, (2) require a fuller treatment and/or, (3) have important geological applications will be taught in Palaeontology II.

Learning outcomes

- CM23 (Convey the need to preserve intact the fossil record of sites of high geological interest as a testimony of past biodiversity.) Convey the need to preserve intact the fossil record of sites of high geological interest as a testimony of past biodiversity.
- CM24 (Integrate respect for biodiversity and the principles of environmental sustainability into the planning and execution of geological projects.) Integrate respect for biodiversity and the principles of environmental sustainability into the planning and execution of geological projects.
- KM31 (Cite the biological principles that have conditioned the evolution of life on Earth through the study of fossils.) Cite the biological principles that have conditioned the evolution of life on Earth through the study of fossils.
- KM32 (Describe the most significant biological characteristics and innovations of the main groups of organisms in the fossil register.) Describe the most significant biological characteristics and innovations of the main groups of organisms in the fossil register.
- KM33 (Identify the main current challenges of palaeontology in the scientific and applied fields.) Identify the main current challenges of palaeontology in the scientific and applied fields.
- SM27 (Apply the study of fossils to reconstruct the environmental conditions of deposition and formation of the rocks that contain them.) Apply the study of fossils to reconstruct the environmental conditions of deposition and formation of the rocks that contain them.
- SM28 (Effectively communicate key concepts about palaeontology, fossils and the evolution of life on Earth to different audiences, using the appropriate tools.) Effectively communicate key concepts about palaeontology, fossils and the evolution of life on Earth to different audiences, using the appropriate tools.
- SM29 (Use fossils as a tool for relative dating and distance correlation between different sedimentary deposits.) Use fossils as a tool for relative dating and distance correlation between different sedimentary deposits.

Contents

GENERAL PALAEOLOGY

- Introduction
- Taphonomy
- Biostratigraphy
- Paleobiology
- Ichnology
- Morphology

FOSSIL RECORD

- Porifera and Cnidaria

- Molluscs

- Brachiopods

- Vertebrates

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

Learning activities and methodology

Title	Hours	ECTS	Learning outcomes
Seminar	3.5	0.14	CM23, CM24, KM31, KM32, KM33, SM27, SM28, SM29
Personal study and work	75	3	CM23, CM24, KM31, KM32, KM33, SM27, SM28, SM29
Lectures	26	1.04	CM23, CM24, KM31, KM32, KM33, SM27, SM28, SM29
Laboratory work	23	0.92	CM23, CM24, KM31, KM32, KM33, SM27, SM28, SM29
Exercises	15	0.6	CM23, CM24, KM31, KM32, KM33, SM27, SM28, SM29

Lectures: Students will acquire the necessary scientific-technical knowledge for the course during lectures. The timing of the class-based theory classes will be posted on the Campus Virtual (CV). Lectures can include in-class exercises. If graded, they will be help increase the lab grade.

Laboratory classes: Attendance 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 fossils in section.

Seminar: analysis of a scientific paper related to one or more topics included in the content list of the subject. A presentation of the results will be made in front of the teacher and classmates (dates to be announced)

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

About 15 minutes from one of the sessions will be allocated to respond to the assessment surveys of teachers and the assessment surveys of the subject.

Annotation: within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Assessment

Continuous assessment activities

Title	Weight	Hours	ECTS	Learning outcomes
Seminar	15%	0	0	CM23, CM24, KM31, KM32, KM33, SM27, SM28, SM29
Exercises in laboratory sessions	15%	0	0	CM23, CM24, KM31, KM32, KM33, SM27, SM28, SM29
Exams	70%	7.5	0.3	CM23, CM24, KM31, KM32, KM33, SM27, SM28, SM29

Continuous evaluation:

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 seminar) and will be subject to the same assessment criteria.

Assessment of this subject is based on the following elements:

- Exams will include theory and practical work, representing (in total) 70% of the final grade. At least, a four (4) is required in each exam to average with the other course grades. Students with a grade lower than 4 in any of the exams, must take re-assessment of these exams. The marks used to calculate the final grade will be those obtained in re-assessment.
- Laboratory-session exercises: 15%. Attending laboratory classes 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. There is no re-assessment for the practical exercises.
- Evaluation of participation and presentation of papers in the seminar: 15%

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

Single evaluation:

Students who have accepted the single assessment will have to take a single exam at the end of the semester. The single assessment exam will include all the theoretical and practical contents of the subject and will weigh 70% of the final grade for the subject. The possibility of taking the exam in two parts may be considered, coinciding with the topics of the partial evaluations. No minimum attendance is established in the laboratory practices for those who have accepted the single evaluation, but attendance is recommended. The exercises that have not been carried out during the practical sessions will be counted with a zero in the final mark of the practical exercises. This evaluation activity will have a weight of 15% in the final mark of the subject. Participation and presentation of work in the session corresponding to the seminars is mandatory and will have a weight of 15% in the final grade for 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 than 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, it 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).

Bibliography

Agustí, J. & Antón, M. 1997. Memoria de la Tierra. Vertebrados fósiles de la Península Ibérica. Ediciones del Serbal, Barcelona. 157 p. ISBN 84 7628 195 1 (566 Agu)

Allison, P.A., Briggs, D.E.G. (eds) 1991. Taphonomy. Releasing the Data Locked in the Fossil Record. Plenum Press. New York. 560 p. ISBN 0 306 43876 3 (56 Tap)

*Armstrong, H.A., Brasier, M.D. 2005. Microfossils (second edition). Blackwell Publishing, Oxford. 296 p. ISBN 0 632 05279 1 (560 Bra)

Astibia, H. (ed.) 1992. Paleontología de Vertebrados: faunas y filogenia, aplicación y sociedad. Servicio Editorial de la Universidad del País Vasco, Leioa. 377 p. ISBN 84 7585 373 0 (566 Pal)

Babin, C. 1971. Éléments de Paléontologie. Librairie Armand Colin. Paris. 408 p. (56 Bab)

Babin, C. 1980. Elements of Palaeontology. John Wiley & Sons. Chichester. 446 p. ISBN 0 471 27577 8 (56 Bab)

*Benton, M.J. 1995. Paleontología y Evolución de los Vertebrados. Perfiles, Lleida. 369 p. ISBN 84 87695 16 7 (566 Ben)

*Benton, M.J. 2000. Vertebrate Palaeontology. Sec. ed. Blackwell Science, Oxford. 452 p. ISBN 0 632 05614 2 (566 Ben)

*Benton, M.J. 2005. Vertebrate Palaeontology. Third ed. Blackwell Science, Oxford. 455 p. ISBN 978 632 05637 8 (566 Ben)

Benton, M.J., Harper, D.A.T. 2009. Introduction to Paleobiology and the Fossil Record. Wiley-Blackwell. Chichester, UK. 592 p. ISBN 978 1 4051 4157 4 ()

*Black, R.M. 1970. Elementos de Paleontología. Fondo de Cultura Económica. Madrid. 339 p. ISBN 84 375 0056 7 (56 Bla)

*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)

*Brasier, M.D. 1980. Microfossils. George Allen & Unwin, London. 193 p. ISBN 0 04 562001 6 (560 Bra)

*Brenchley, P.J., Harper, D.A.T. 1998. Palaeoecology, ecosystems, environments and evolution. Chapman & Hall. London. 402 p.

*Briggs, D.E.G., Crowter, P.R. (eds) 1990. Palaeobiology. A synthesis. Blackwell. Oxford. 583 p. ISBN 0 632 03311 8 (56 Pal) [accés lliure per Internet](#)

*Briggs, D.E.G., Crowter, P.R. (eds) 2001. Palaeobiology II. Blackwell Science. Oxford. 583 p. ISBN 0 632 05149 3 (56 Pal)

- Carroll, R. L. 1988. Vertebrate Paleontology and Evolution. W.H. Freeman and Co, New York. 698 p. ISBN 0 716 71822 7 (566 Car)
- Chaline, J. 1987. Paléontologie des Vertébrés. Dunod, Paris. 177 p. ISBN 2 04 012335 0 (566 Cha)
- *Clarkson, E.N.K. 1979. Invertebrate Palaeontology and Evolution. George Allen & Unwin, London. 323 p. ISBN 0 04 560008 2 (562 Cla)
- *Clarkson, E.N.K. 1986. Paleontología de Invertebrados y su evolución. Paraninfo. Madrid. 357 p. ISBN 84 283 1454 3 (562 Cla)
- *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 0632 04444 6 (56 Cow)
- *Doménech, R., Martinell, J., (Martín-Closas, C.) 1993. Introducció als fòssils. Promociones y Publicaciones Universitarias. Barcelona. 298 p. ISBN 84 477 0283 9 (56 Dom)
- *Doménech, R., Martinell, J., (Martín-Closas, C.) 1996. Introducción a los fósiles. Masson. Barcelona. 288 p. ISBN 84 458 0404 9 (56 Dom)
- Donovan, S.K. (ed.) 1989. Mass Extinctions. Processes and Evidence. Belhaven Press. London. 265 p. ISBN 1 85293 059 4 (56.017.4 Mas)
- *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 0613 7 (56Foo)
- Fortey, R. 2006. ¡Trilobites! Laetoli, Pamplona. 308 p. ISBN 84 934862 3 X ()
- *Gallemí, J. (Coordinador). 1988. El registre fòssil. Història Natural dels Països Catalans. T 15. Ed. Enciclopèdia Catalana. 438 p. ISBN 84 7739 022 3 ()
- Halstead, L.B. 1978. The evolution of Mammals. Meter Lowe. Eurobook Limited. ISBN 0 85654 030 7 (599 Hal)
- Hammer, O., Harper, D.A.T. 2006. Paleontological data analysis. Blackwell Publishing. 351 p. ISBN 1405115440 (56 Ham)
- Jablonski, D., Erwin, H., Lipps, J.H. (eds) 1996. Evolutionary Paleobiology. The University of Chicago Press. Chicago. 483 p. ISBN 0 226 38913 8 (56 Evo)
- Lecointre, G., Le Guyader, H. 2001. Classification phylogénétique du vivant. Belin. 543 p. ISBN 2 7011 2137 X (575 Lec)
- 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)
- Martill, D.M., Hudson J.D. 1991. Fossils of the Oxford Clay. The Palaeontological Association. London. 286 p. ISBN 0 901702 46 3 (564 Fos)

- *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. 1986, 1990, 1995. Paleontología. Tomo 2 Vertebrados: Peces, Anfibios, Reptiles y Aves. Tomo 3 vol. 1 Mamíferos 1ª parte. Tomo 3 vol. 2 Mamíferos 2ª parte. Paraninfo, Madrid. 177 p. 383 p. 451 p.
- *Meléndez, B. 1998. Tratado de Paleontología, I. CSIC. Madrid. ISBN 84 00 07790 3 (56 Mel)
- *Molina, E. (editor) 2002. Micropaleontología. Prensas Universitarias de Zaragoza, Zaragoza. 634 p. ISBN 84 7733 619 9 (560 Mol)
- *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, molts 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)
- Owen, E., Smith, A.B. 1987. Fossils of the Chalk. The Palaeontological Association. London. 306 p. ISBN 0 901702 36 6 (86(4) Fos)
- Palmer, D., Rickards, B. 1991. Graptolites. Boydell Press. Woodbridge. 166 p + 138 pl. ISBN 0 85115 262 7 (562 Gra)
- Piveteau, J., Lehman, J.P. & Dechaseaux, C. 1978. Précis de Paléontologie des Vertébrés. Masson, Paris. 677 p. ISBN 2 225 480923 3 (566Piv)
- *Raffi, S., Serpagli, E. 1993. Introduzione alla Paleontología. Scienze della Terra UTET. Unione Tipografico-Editrice Torinese. 654 p. ISBN 88 02 04672 7 (56 Raf)
- Raup, D.M., Stanley, S.M. 1978. Principios de Paleontología. Ariel. Barcelona. 456 p. ISBN 84 344 0145 2 (56 Rau)
- Roger, J. 1974. Paléontologie générale. Collection Sciences de la Terre. Masson et Cie. Paris. 419 p. ISBN 2 225 40458 5 (56 Rog)
- Savage, R.J.G. & Long, M.R. 1986. Mammal Evolution: an illustrated guide. British Museum Natural History, London. 259 p. ISBN 0 565 00942 7 (599 Sav)
- Simpson, G.G. 1985. Fósiles e historia de la vida. Biblioteca Scientific American. Labor. Barcelona. 240 p. ISBN 84 7593 006 9 (56 Sim)
- Skelton, P.W. (ed.) 1993. Evolution: a biological and palaeontological approach. Addison-Wesley, Wokingham. 1064 p. ISBN 0201544237 (575 Evo)
- Skelton, P.W., Spicer, B., Rees, A. 1997. Evolving life and the Earth. The Open University. Milton Keynes. 199 p. ISBN 0 7492 8185 5 (56 Ske)
- Smith, A.B. 1984. Echinoid Palaeobiology. GeorgeAllen & Unwin. London. 190 p. ISBN 0 04 563001 1 (560 Smi)
- Smith, A.B. 1994. Systematics and the fossil record. Documenting evolutionary patterns. Blackwell Science. Oxford. 223 p. ISBN 0 632 03642 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)

Sutton, M.D., Rahman, I.A., Garwood, R.J. 2014. Techniques for virtual Palaeontology. J. Wiley & Sons. Ltd. ISBN 9781118591130

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

Ziegler, B. 1983. Introduction to Palaeobiology. General Palaeontology. Ellis Horwood. Chichester. 225 p. ISBN 0 85312 531 7 (56 Zie)

* basic bibliography

Other references for specific groups will be announced in theory or practical classes.

WEBSITES

ECHINIDS. www.nhm.ac.uk/our-science/data/echinoid-directory

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

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

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

Software

- In case it is needed, it will be announced through the Virtual Campus.

Course groups and languages

The information provided is provisional until November 30. After this date, you will be able to consult the language of each group through this [link](#). To access the information, you will need to enter the course CODE

Type of teaching	Group	Language	Semester	Shift
(TE) Theory	1	Catalan	first semester	morning-mixed
(PLAB) Practical laboratories	1	Catalan	first semester	morning-mixed
(SEM) Seminars	1	Catalan	first semester	morning-mixed
(PLAB) Practical laboratories	2	Catalan	first semester	morning-mixed
(SEM) Seminars	2	Catalan	first semester	morning-mixed
(PLAB) Practical laboratories	3	Catalan	first semester	morning-mixed
(SEM) Seminars	3	Catalan	first semester	morning-mixed