

 UNIVERSITAT DE BARCELONA	Teaching plan for the course unit

General information

Course unit name: Paleobiologia Continental

Course unit code: 575564

Academic year: 2023-2024

Coordinator: Josep Sanjuan Girbau

Department: Department of Earth and Ocean Dynamics

Credits: 15

Single program: S

Estimated learning time	Total number of hours 375
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Face-to-face and/or online activities	96	
- Lecture	Face-to-face and online	96
Supervised project	154	
Independent learning	125	

Competences to be gained during study
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To demonstrate capabilities for the autonomous acquisition of information in order to develop an explanation related to continental paleobiology.

To share knowledge and critically evaluate individual and collective decisions in a context of teamwork to write a scientific article on the evolution of continental plants and animals, reducing inequalities based on sex and gender.

To acquire and understand knowledge that provides a basis or opportunity to be original in the development and/or application of ideas, often in a research context.

Students should know how to apply the knowledge acquired and have the ability to solve problems in new or little-known environments, within broader or multidisciplinary contexts related to their area of study.

Students should know how to communicate their conclusions and knowledge as well as the reasoning on which they are based, to specialized and non-specialized audiences in a clear way and without ambiguity.

Students should know how to apply information from the fossil record to solve paleoenvironmental problems (palaeoclimate, palaeoecology).

Students should know how to recognize the main groups of continental fossils.

Learning objectives

Referring to knowledge

To apply the fossil record of continental plants, invertebrates and vertebrates to solve problems related to evolution, palaeoenvironment, palaeoclimatology and biostratigraphy in terrestrial habitats.

To disseminate the acquired knowledge on continental fossils to a non-specialized audience.

Teaching blocks

1. Evolution of plants

* Origin and evolution of the terrestrial plants from the Ordovician to the present. Main phases of the terrestrial plant evolution: colonization of continents, origin of vascular plants, origin and radiation of seed plants, origin and radiation of flowering plants. Implementation of fossil plants in palaeoclimatic and palaeoenvironmental reconstructions of ancient terrestrial ecosystems.

2. Continental invertebrates

- * Evolution, phylogeny and palaeobiology of terrestrial invertebrates, mainly arthropods and molluscs from the late Palaeozoic. Interaction and coevolution between plant-insect.

3. Palaeobiology and evolution of tetrapods

- * Origin and evolution of the tetrapods from the Devonian to the present including the colonization of terrestrial habitats and the radiation and evolution of amniotes. Origin, evolution, and palaeobiology of reptiles, parareptiles, and eureptiles as well as the first flying vertebrates (pterosaurs) and the dinosaurs (including the origin of feathers and the flight of birds). Herpetological biodiversity of the Cenozoic and Quaternary.

4. Palaeobiology and evolution of mammals

- * Origin, evolution, and palaeobiology of mammals, highlighting the main groups of micromammals (rodents) and macromammals (carnivores, artiodactyls, perissodactyls, etc). Biodiversity of micromammals, evolution and palaeobiology. The large mammal fauna from the Neogene and Quaternary of Europe. Evolution of mammals in insular conditions. The role of Dorotea Bate.

5. Fossil primates and human evolution

- * Origin and adaptations of the archaic and modern primates. Divergence between the Strepsirhini and Haplorhini, origin and radiation of the anthropoids, palaeobiodiversity and palaeobiology (locomotion, diet and cognition) of the hominoids. Eocene primates from the Iberian Peninsula and fossil catarrhine from the Miocene of Catalonia. Human evolution: first hominines, australopithecines, origin and diversity of the genus *Homo*.

Teaching methods and general organization

The course is organized in hybrid master classes of 2 hours each. The classes are composed by supervised, directed and autonomous teaching activities and will be based mainly on the following methodologies through a virtual communication platform:

- Live broadcast of the master classes. The theoretical concepts related to the five main blocks (Teaching blocks) will be taught.
- Development of exercises about reading/analyzing scientific articles related to continental palaeobiology in an autonomous way and subsequent debate.
- Works and analysis of individual and group cases.
- Follow-up or consultation mentoring.

Official assessment of learning outcomes

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- Attendance and active participation in class: 10%
 - Activities and Exercises: 20%
 - Delivery of reports/work: 30%
 - Theory examinations/synthesis: 40%

Examination-based assessment

- Final theory examination: 100%

Reading and study resources

[Consulteu la disponibilitat a CERCABIB](#)

Book

Clack, J.A. 2012. *Gaining Ground. The Origin and Evolution of Tetrapods*. [Indiana University Press](#), 2nd volume, 544 pp.

Grimaldi, D., Engel, M.S. 2005. *Evolution of the Insects*. Cambridge University Press, 755 pp.

Kemp, T.S., 2005. *The Origin and Evolution of Mammals*. Oxford University Press, 331 pp.

Lewin, R., Foley, R.A., 2004. *Principles of Human Evolution*, 2nd Edition. Oxford: Blackwells, 555 pp.

Martinetto, E., Tschopp, E., Gastaldo, R.A., 2020. *Nature Through Time*. Springer Nature, 462 pp.

Mc Elwain, J., 2018. *Paleobotany and Global Change: Important Lessons for Species to Biomes from Vegetation Responses to Past Global Change*, *Annual Reviews Plant Biology*, 69:761-787.

Taylor, T., Taylor, E., Krings, M., 2009. *Paleobotany: The Biology and Evolution of Fossil Plants*. Academic Press, 2nd Edition, 1252 pp.

Willis, K.J., Mc Elwain, J.C., 2002. *The Evolution of Plants*, Oxford, 378 pp.