60433 - Paleontology and dynamics of the biosphere

Información del Plan Docente

Academic Year	2016/17
Academic center	100 - Facultad de Ciencias
Degree	541 - Master's in Geology: Techniques and Applications
ECTS	5.0
Course	1
Period	Second semester
Subject Type	Optional
Module	---

1.Basic info

1.1.Recommendations to take this course

1.2.Activities and key dates for the course

2.Initiation

2.1.Learning outcomes that define the subject

2.2.Introduction

3.Context and competences

3.1.Goals

3.2.Context and meaning of the subject in the degree

3.3.Competences

3.4.Importance of learning outcomes

4.Evaluation

5.Activities and resources

5.1.General methodological presentation

The learning process that is designed for this subject is based on the following:
The course is divided into three units and a seminar that cover the contents thereof, from the origin of life on earth to the contributions of the reconstructions of the paleodiversidad to geology, biology, ecology, evolution, etc. The seminar is dedicated to the contributions of the Earth's interplanetary paleontology studies, such as the detection of fossil life on other planets like Mars.
The practices are synchronized with the theory, these various techniques for solving problems of analysis of biological record in the past, shape analysis, evolution of fossil associations and paleoenvironmental inferences, paleoecological and paleobiogeographic apply.
The subject has a workload broken down into the following types of educational activities:

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1. Lecture (1.9 ECTS): detailed discussion of the issues with the help of ICT and active participation of students.
2. Laboratory Practice (2.8 ECTS): application of various techniques for solving problems based on actual or potential cases, use of general or specific software.
3. Seminar (0.3 ECTS): discussion of the proposed topic for the seminar.
In order to optimize the coordination between theoretical and practical content they are planned intensive sessions that can dedicate part of the session to the more theoretical aspects, from then to its practical development.

5.2.Learning activities

Paleontology and dynamics of the biosphere is a course of 5 credits , consisting of 50 hours of theory and practical distributed throughout the second semester. At the end there is a seminar in which students are given the opportunity to speak with investigators in the terrestrial biosphere working in other fields.
The practices consist of theoretical and practical problems solved in class , during the sessions.

5.3.Program

The program that the student is offered help achieve the expected results and includes the following:
Unit 1: Contributions of paleontology to the knowledge of the biosphere
1.1. Contributions of paleontology to the knowledge of the biosphere and its dynamics: a historical perspective.
1.2. The phenomenon of life on Earth
1.3. The origin of life: the interpretation of the fossil record
Unit 2: The evolution of the shape of organisms
2.1. Diversification morphologic and ecological disparity. environmental change and natural selection in paleontology. Coevolution.
2.2. Phylogenetic inference and its application in Paleobiogeography
Unit 3: The study of palaeobiodiversity
3.1. Contributions of taphonomic analysis on the correct interpretation of the fossil record and analysis of the palaeobiodiversity
3.2. Geosphere and Biosphere: impact of the organisms in the ecosystems of the past and in the fossil record.
3.3. Biosphere response to environmental perturbations to regional and global scale.
3.4. Periodicity on a geological scale of biotic events
3.5. Using paleontological data banks in the study of biodiversity and its dynamics
3.6. Contributions in the fields of evolutionary ecology, the Macroecology and Historical Biogeotrafía.
Seminar
Contributions of Paleontology in the field of astrobiology

5.4.Planning and scheduling

The course will be taught in theoretical and practical sessions of 3-4 hours on Mondays in the morning . The final schedules are available on the website of the Faculty of Science .
M ore information will be on bulletin boards in class and Digital Teaching Ring (https://moodle2.unizar.es/add/) or on the website Aragosaurus (http://www.aragosaurus.com/) where available of this information.

5.5.Bibliography and recomended resources

- Arsuaga Ferreras, Juan Luis. El enigma de la esfinge : [las causas, el curso y el propósito de la evolución] / Juan Luis Arsuaga . - 1a. ed. Barcelona : Areté, D.L. 2001
- Asher, R.J. . From Clone to Bone. The synergy of morphological and Molecular Tools in Paleobiology. Cambridge University press. 2012
- Benton, M.J. . The History of Life: A Very Short Introduction. 1st Oxford University Press. 2008
- Brenchley, P.J. . Palaeoecology: Ecosystems, environment and evolution. 1st Chapman & Hall. 1997
- Crisci, J.V. . Introducción a la teoría y práctica de la biogeografía histórica. Sociedad Argentina de Botánica. 2000
- Darwin, Charles. El origen de las especies por medio de la selección natural / Charles Darwin ; la traducción del inglés ha sido hecha por Antonio de Zulueta Madrid : Calpe, 1921

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- Domènech, Rosa. Introducción a los fósiles / Rosa Domènech, Jordi Martinell ; con la colaboración de Carles Martín-Closas Barcelona [etc.] : Masson, D.L. 1996
- Donogue P.C.J.. Telling the Evolutionary Time. Taylor & Francis. 2003
- Felsenstein, Joseph.. Inferring phylogenies / Josephe Felsenstein. Sunderland, Mass. : Sinauer Associates, 2004.
- Freeman, Scott. Análisis evolutivo / Scott Freeman, Jon C. Herron ; traducción, José Luis Ménsua Fernández, Santiago Elena Fito. - 2ª ed. Madrid [etc.] : Prentice Hall, D.L. 2002
- Hammer, Oyvind. Paleontological data analysis / Hammer à?yvind and David A.T. Harper Malden, Massachusetts : Blackwell Publishing, 2006
- Numerical palaeobiology : computer-based modelling and analysis of fossils and their distributions / edited by David A. T. Harper Chichester [etc.] : John Wiley & Sons, 2000
- Cladistics : the theory and practice of parsimony analysis / Ian J. Kitching ... [et al.]. . - 2nd ed. Oxford ; New York : Oxford University Press, 1998
- Lemey, P.. The phylogenetic handbook. Apractical approach to phylogenetic Analysis and Hypothesis testing. 2nd Cambridge University press. 2009
- López Martínez, Nieves. Paleontología : conceptos y métodos / Nieves López Martínez, Jaime Truyols Santonja Madrid : Síntesis, D.L. 1994
- Guía de campo de los fósiles de España / Nieves López Martínez (coordinadora) Madrid : Pirámide, D.L. 1986
- Guía de campo de los fósiles de España / Nieves López Martínez (coordinadora) . - 2a. ed. Madrid : Pirámide, D.L. 1987
- Guía de campo de los fósiles de España / Nieves López Martínez (coordinadora) . - [3a. ed.] Madrid : Pirámide, 1988
- Paleontología de invertebrados / editores, M. Luisa Martínez Chacón y Pascual Rivas Madrid [etc.] : Sociedad Española de Paleontología [etc.] , 2009
- McKinney, M.L.. Biodiversity dynamics. Turnover of populations, taxa, and communities. Columbia University press. 1998
- Micropaleontología / Eustoquio Molina (editor) Zaragoza: Prensas Universitarias de Zaragoza, 2002
- Parenti L.R.. Comparative Biogeography. Discovering and classifying biogeographical patterns of a dynamic Earth. . University of California press. 2009
- Patzkowsky, M.E. . Stratigraphic paleobiology. Understanding the distribution of fósil taxa in time and space. University of Chicago Press. 2012
- Skelton, Peter. Cladistics : a practical primer on CD-ROM / by Peter Skelton and Andrew Smith ; accompanying booklet by Neale Monks Cambridge : Cambridge University Press , 2002
- Tudge, Colin. La variedad de la vida : historia de todas las criaturas de la tierra / Colin Tudge ; [traducción castellana de Joan Lluis Riera] Barcelona : Crítica, D.L. 2001
- Wheeler, W.C. . Systematics: a course of lectures. Wiley-Blackwell. 2012
- Zunino, M .. Biogeografía. La dimensión espacial de la evolución. Fondo de Cultura económica. Mexico. 2003
- Head M. J. & Gibbard P.L. . Early Middle Pleistocene transitions: The Land-Ocean Evidence.. London [Geological Society London Special Publications n.247. Pag: 277-286]