VNIVERSITAT DE VALÈNCIA

Course Guide
44302 Sedimentary environments and fossil record

COURSE DATA

Data Subject	
Code	44302
Name	Sedimentary environments and fossil record
Cycle	Master's degree
ECTS Credits	3.0
Academic year	2022 - 2023

Study (s)

Degree	Center	Acad. year	Period
2200 - M. U. en Paleontología Aplicada	Faculty of Biological Sciences	1	First term

Subject-matter

Degree	Subject-matter	Character
2200 - M. U. en Paleontología Aplicada	3 - Advanced scientific training	Optional

Coordination

Name	Department
BOTELLA SEVILLA, HÉCTOR	356 - Botany and Geology

SUMMARY

The objective of this subject is the basic training of the student in the contextualization of the fossil record within the framework of sedimentary environments, both current and the geological record. The starting point consists of the spatial-temporal arrangement of rocks and sediments. The second place illustrates the basic keys that define the paleoenvironmental parameters archived in the sediments and rocks. In this area, special attention is paid to the content of fossil organisms in the different sedimentary environments. Finally, this subject aims to provide training in the most common techniques and procedures for field and laboratory work.

PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

There are no specified enrollment restrictions with other subjects of the curriculum.

Other requirements

NO

OUTCOMES

2200 - M. U. en Paleontología Aplicada

- Students should apply acquired knowledge to solve problems in unfamiliar contexts within their field of study, including multidisciplinary scenarios.
- Students should be able to integrate knowledge and address the complexity of making informed judgments based on incomplete or limited information, including reflections on the social and ethical responsibilities associated with the application of their knowledge and judgments.
- Students should communicate conclusions and underlying knowledge clearly and unambiguously to both specialized and non-specialized audiences.
- Students should demonstrate self-directed learning skills for continued academic growth.
- Students should possess and understand foundational knowledge that enables original thinking and research in the field.
- Be able to access to information tools in other areas of knowledge and use them properly.
- To be able to assess the need to complete the scientific, historical, language, informatics, literature, ethics, social and human background in general, attending conferences, courses or doing complementary activities, self-assessing the contribution of these activities towards a comprehensive development.
- Be able to communicate and disseminate scientific ideas.
- Ser capaces de trabajar en equipo con eficiencia en su labor profesional o investigadora, adquiriendo la capacidad de participar en proyectos de investigación y colaboraciones científicas o tecnológicas
- Ser capaces de realizar una toma rápida y eficaz de decisiones en situaciones complejas de su labor profesional o investigadora, mediante el desarrollo de nuevas e innovadoras metodologías de trabajo adaptadas al ámbito científico/investigador, tecnológico o profesional en el que se desarrolle su actividad.
- Ser capaces de acceder a la información necesaria en el ámbito específico de la materia (bases de datos, artículos científicos, etc.) y tener suficiente criterio para su interpretación y empleo.
- Aplicar el razonamiento crítico y la argumentación desde criterios racionales.
- Capacidad para preparar, redactar y exponer en público informes y proyectos de forma clara y coherente, defenderlos con rigor y tolerancia y responder satisfactoriamente a las críticas que pudieren derivarse de su exposición.

- Conocer y comprender en profundidad la naturaleza de la biodiversidad y sus relaciones ecosistémicas tanto en la actualidad como en el pasado.
- Conocer la naturaleza del registro fósil en relación con el proceso sedimentario, las fases bioestratinómicas y fosildiagenéticas del proceso y los mecanismos de fosilización.
- Conoce la naturaleza del registro estratigráfico, sus discontinuidades, los ciclos y eventos, los diferentes tipos de cuencas sedimentarias, los factores que controlan su relleno, las geometrías tridimensionales resultantes y las correlaciones estratigráficas.
- Conocer los principios fundametales del análisis de fácies en sistemas deposicionales continentales, transicionales y marinos, y el uso de los fósiles para la interpretación paleoambiental del registro estratigráfico.

LEARNING OUTCOMES

Know and reflect on the main concepts of stratigraphy. Understand the meaning of the temporal scale in Geology, as well as the spatial one. Know the different sedimentary processes that act on the planet. Assess the discontinuous nature of the stratigraphic record and distinguish the different types of discontinuities. To know and to differentiate the different types from geologic units: lithostratigraphic, chronostratigraphic, biochronological and geochronological. Differentiate the different sedimentary environments, as well as their most significant fossil record. Know and differentiate in the field the main models of facies of continental, transitional and marine deposit systems. Accurately raise a stratigraphic section in the field. Elaborate a stratigraphic section using digital drawing programs for inclusion in scientific and professional documents.

DESCRIPTION OF CONTENTS

1. Basic concepts of stratigraphy.

Descriptive and interpretive stratigraphy. Sedimentary processes and their record. Sedimentary environments and their fossil record. Facies models of continental, transitional and marine depositional systems

2. Analysis techniques of the stratigraphic and sedimentological record

Data acquisition procedures both in outcrops of different scale. Survey of stratigraphic and sedimentological series. Recognition of sedimentary structures in the field. Laboratory techniques applied to the study of lutitic, detrital and carbonate sediments.

WORKLOAD

ACTIVITY	Hours	% To be attended
Classroom practices	15,00	100
Theory classes	10,00	100
Laboratory practices	5,00	100
TOTAL	**30,00**	

TEACHING METHODOLOGY

The achievement of the objectives of the subject is achieved through three directly related teaching methodologies:

Theoretical classes:

Based on the master class complemented by posing practical questions that are solved in class as group tutorials. Based on lectures and debate sessions on the topics that appear in the program of theoretical classes.

Laboratory practice classes

Development of practices in working groups with development of the various sedimentological techniques used in the analysis of current sedimentary facies and their fossil record.

Field practice classes

Field work on the main aspects seen during the theoretical sessions. Based on a guided itinerary through different enclaves relevant for their stratigraphic and sedimentological features, as well as their fossil record. It also includes the survey of detailed stratigraphic sessions.

EVALUATION

The evaluation of the theoretical and practical aspects of the subject will be carried out through a theoretical exam, an oral presentation on a related topic on a sedimentary environment and its fossil record, as well as the delivery of a report of field and laboratory practices according to with the following weighting:

Evaluation activities

Final test 40%

Field and laboratory practice report 20%

Oral presentation on chosen topic 40%

REFERENCES

Basic

- NICHOLS, Gary (2009). Sedimentology and stratigraphy. Oxford : Blackwell Science, 2009.
- ARCHE, Alfredo (ed. lit.) (2010). Sedimentología: del proceso físico a la cuenca sedimentaria. Madrid : CSIC, 2010.
- Vera, J.A (1994): Estratigrafía. Principios y métodos. Ed. Rueda.

Additional

- READING, H. G. (ed.). 1996. Sedimentary environments: processes, facies and stratigraphy. Oxford : Blackwell Science, 1996.
- STOW, Dorrik A.V. (2005). Sedimentary rocks in the field : a colour guide. London: Manson Publishing.