



Information about the subject

Degree: Bachelor of Science Degree in Marine Sciences

Faculty: Faculty of Veterinary Medicine and Experimental Sciences

Code: 273007 **Name:** Geological Oceanography

Credits: 6,00 **ECTS Year:** 3 **Semester:** 1

Module: Professional

Subject Matter: Oceanography **Type:** Compulsory

Department: Oceanography and Environment

Type of learning: Classroom-based learning

Languages in which it is taught: Spanish

Lecturer/-s:

273A

Silvia Albarracin Gonzalez (**Responsible Lecturer**)

silvia.albarracin@ucv.es



Module organization

Professional

Subject Matter	ECTS	Subject	ECTS	Year/semester
Oceanography	36,00	Chemical Oceanography	6,00	3/1
		Geological Oceanography	6,00	3/1
		Marine Biology and Biological Oceanography	6,00	3/1
		Methods in Oceanography I: Physical and Geological	6,00	3/2
		Methods in Oceanography II: Chemical and Biological	6,00	3/2
		Physical Oceanography	6,00	3/1
Marine living resources	12,00	Aquaculture	6,00	3/2
		Fisheries	6,00	3/2
Marine and Coastal Management	18,00	Coastal Planning and Management	6,00	4/1
		Legislation and Economy	6,00	4/1
		Marine Pollution	6,00	4/1



Recommended knowledge

The student must have passed the Geology, Geophysics and Tectonics courses. Spatio-temporal skills.

Learning outcomes

At the end of the course, the student must be able to prove that he/she has acquired the following learning outcomes:

- R1 The student knows the main morphologies of the seabed (platforms, slopes, abyssal plains, dorsal plains, etc.).
- R2 The student designs and interprets a stratigraphic column.
- R3 The student correlates isochronous and isopic facies between several stratigraphic columns.
- R4 The student knows the main concepts about climatic variability and the oscillations of the mean sea level.
- R5 The student knows how to identify seismic units and relates them to the processes of programming, aggradation and retrogradation.
- R6 The student knows the fundamental concepts in Paleontology.
- R7 The student knows the keys to identification.



Competencies

Depending on the learning outcomes, the competencies to which the subject contributes are (please score from 1 to 4, being 4 the highest score):

BASIC	Weighting			
	1	2	3	4
CB4 Command of a foreign language			X	
CB5 Students develop the necessary learning skills to undertake further studies with a high level of autonomy.				X

GENERAL	Weighting			
	1	2	3	4
CG1 Capacity to analyze and synthesize				X
CG2 Capacity to organize and plan			X	
CG3 Mastering Spanish oral and written communication		X		
CG5 Knowing and applying Basic ITC skills related to marine science		X		
CG6 Capacity to manage information (capacity to look for and analyze information coming from different types of sources)			X	
CG7 Decision making		X		
CG8 Capacity to work in interdisciplinary and multidisciplinary team		X		
CG9 Interpersonal skills		X		
CG10 Critical and self-critical capacity		X		
CG11 Capacity to learn		X		
CG12 Capacity to adapt to new situations				X



CG16	Capacity to apply theoretical knowledge				X
CG17	Research skills				X
CG18	Sensibility to environmental issues.	X			

SPECIFIC		Weighting			
		1	2	3	4
CE1	Knowing and understanding contents, principles and theories related to Oceanography		X		
CE7	Collecting, assessing, processing and interpreting oceanographic data, following the most recent theories		X		
CE9	Knowing how to carry out experiments and measurements both in the laboratory and during sample collection		X		

Assessment system for the acquisition of competencies and grading system

Assessed learning outcomes	Granted percentage	Assessment method
R1, R2, R4, R5, R6	50,00%	Written test with theoretical and practical questions
R2, R3, R4, R5	30,00%	Delivery of guided assignments, whose objectives and contents will be proposed by the teacher
R2, R3, R4, R6	10,00%	Laboratory test
R1	10,00%	Oral presentation

Observations

A minimum score of 5 points out of 10 is required in all evaluable items to average the final grade of the course.



MENTION OF DISTINCTION:

According to Article 22 of the Regulations governing the Evaluation and Qualification of UCV Courses, the mention of "Distinction of Honor" may be awarded by the professor responsible for the course to students who have obtained, at least, the qualification of 9 over 10 ("Sobresaliente"). The number of "Distinction of Honor" mentions that may be awarded may not exceed five percent of the number of students included in the same official record, unless this number is lower than 20, in which case only one "Distinction of Honor" may be awarded.

Learning activities

The following methodologies will be used so that the students can achieve the learning outcomes of the subject:

- M1 Teacher presentation of contents, analysis of competences, explanation and in-class display of skills, abilities and knowledge.
- M2 Group work sessions supervised by the professor. Case studies, diagnostic tests, problems, field work, computer room, visits, data search, libraries, on-line, Internet, etc. Meaningful construction of knowledge through interaction and student activity.
- M3 Activities carried out in spaces with specialized equipment.
- M4 Supervised monographic sessions with shared participation.
- M5 Application of multidisciplinary knowledge.
- M6 Personalized and small group attention. Period of instruction and/or guidance carried out by a tutor to review and discuss materials and topics presented in classes, seminars, readings, papers, etc.
- M8 Set of oral and/or written tests used in initial, formative or additive assessment of the student.
- M9 Group preparation of readings, essays, problem-solving, seminars, papers, reports, etc. to be presented or submitted in theoretical, practical and/or small-group tutoring sessions. Work done on the university e-learning platform (www.plataforma.ucv.es)
- M10 Student's study: Individual preparation of readings, essays, problem-solving, seminars, papers, reports, etc. to be presented or submitted in theoretical, practical and/or small-group tutoring sessions. Work done on the university e-learning platform (www.plataforma.ucv.es).



IN-CLASS LEARNING ACTIVITIES

	LEARNING OUTCOMES	HOURS	ECTS
ON-CAMPUS CLASS M1	R1, R2, R4, R5, R6, R7	30,00	1,20
PRACTICAL CLASSES M2	R2, R3, R4	20,00	0,80
LABORATORY M3	R7	2,00	0,08
SEMINAR M4	R1, R2	2,00	0,08
GROUP PRESENTATION OF ASSIGNMENTS M5	R1	2,00	0,08
TUTORIAL M6	R2, R3, R4, R6	2,00	0,08
ASSESSMENT M8	R1, R2, R3, R4, R5, R6	2,00	0,08
TOTAL		60,00	2,40

LEARNING ACTIVITIES OF AUTONOMOUS WORK

	LEARNING OUTCOMES	HOURS	ECTS
GROUP WORK M9	R1, R2, R4	40,00	1,60
INDEPENDENT WORK M10	R3, R5, R6	50,00	2,00
TOTAL		90,00	3,60



Description of the contents

Description of the necessary contents to acquire the learning outcomes.

Theoretical contents:

Content block	Contents
Unit I MORPHOLOGY OF SEABED	Continental shelf, slope, underwater valleys, underwater canyons, landslides and overflows, turbidic systems, abyssal plain, mid-oceanic channels, ridges, underwater mountains. Spanish continental platforms.
Unit II SEA LEVEL FLUCTUATIONS AND THEIR STRATIGRAPHIC RECORDING	Accommodation space. Absolute and relative oscillations of sea level. Transgressions and regressions. Causes of sea level oscillations. Stratigraphic facies. Types of facies. Radiometric dating techniques, magnetostratigraphy, fission traces, luminescence and amino acid racemization. Stratigraphic correlation.
Unit III SEISMIC AND SEQUENTIAL STRATIGRAPHY	Stratigraphy and sedimentology: Continuity and discontinuity. Non-conformities. Coinage. Agradation, progradation and retrogradation. Depositional sequences. Parasequences and Cyclicity. Basin analysis: Stratigraphic sequence of siliciclastic and carbonate systems. Stratigraphic sequence of turbidic deposits and contours. Expansive (onlap) and retroactive (offlap) overlap. Basal (downlap) and somital (toplap) beveling. Internal bed shapes.
Unit IV INTRODUCTION TO PALEONTOLOGY	Concept of fossil and types of fossils. Working methods in paleontology. Guide fossils. Marine macrofossils. Marine microfossils. Biostratigraphy. Paleoceanography and Paleoclimatology.



Organization of the practical activities:

	Content	Place	Hours
PR1.	Morpho-genetic study of the seabed. Creating a report with the morphology and the behavior of tectonic plates from the analysis of the topography and bathymetry.	Computer	10,00
PR2.	Stratigraphic column	Computer	10,00
PR3.	Stratigraphic correlation and description of facies	Marine station	10,00
PR4.	Description of guide fossils and paleontological site	Laboratory	2,00

Temporary organization of learning:

Block of content	Number of sessions	Hours
Unit I MORPHOLOGY OF SEABED	10,00	20,00
Unit II SEA LEVEL FLUCTUATIONS AND THEIR STRATIGRAPHIC RECORDING	8,00	16,00
Unit III SEISMIC AND SEQUENTIAL STRATIGRAPHY	9,00	18,00
Unit IV INTRODUCTION TO PALEONTOLOGY	3,00	6,00



References

- ALLEN, P.A. and ALLEN, J.R. (2005) Basin analysis. Principles and applications. Oxford: Blackwell Science Ltd.
- ALONSO, B. y ERCILLA, G. (Eds.) (2000) Valles submarinos y sistemas turbidíticos modernos. Barcelona: Consejo Superior de Investigaciones Científicas.
- ARCHE MIRALLES, A. (2010). Sedimentología: del proceso físico a la cuenca sedimentaria. Madrid: Consejo Superior de Investigaciones Científicas.
- BROOKFIELD, M.E. (2004). Principles of stratigraphy. Oxford: Blackwell Science Ltd.
- BURDIGE, D.J., and LERMAN, A. (2006) Geochemistry of marine sediments (Vol. 41). Princeton University Press.
- COE, A.L. (Ed.). (2003). The sedimentary record of sea-level change. Cambridge: Cambridge University Press.
- CORRALES, I. (1977). Estratigrafía. Madrid: Rueda.
- CROUDACE, IAN W., ROTHWELL, R. GUY (Eds.) (2015). Micro-XRF Studies of Sediment Cores: Applications of a non-destructive tool for the environmental sciences. Londres: Springer
- ELDERFIELD, H., HOLLAND, H.D., AND TUREKIAN, K.K (2003). The oceans and marine geochemistry Treatise on geochemistry (Vol. 6). Elsevier.
- FLOR, G. (2004). Geología Marina. Oviedo: Universidad de Oviedo.
- GARCÍA ESTÉVEZ J.M. (2011). Métodos y técnicas en investigación marina. Tecnos
- KENNET, J.P. (1982). Marine Geology. Prentice Hall, 1-813 pp.
- LEEDER, M. (1999). Sedimentology and Sedimentary Basins. From turbulence to tectonics. Oxford: Blackwell Science Ltd.
- LÓPEZ, N., Y TRUYOLS, J., (1994). Paleontología. Madrid: Síntesis.
- MELÉNDEZ, B. Paleontología (1981). Madrid: Paraninfo
- MELÉNDEZ, B. Y FÚSTER, J.M. (1981). Geología. Madrid: Paraninfo.
- MOLINA, E. (2004). Micropaleontología. Pressas Universitarias de Zaragoza, 704p.
- NICHOLS, G. (2004). Sedimentology and Stratigraphy. Oxford: Blackwell Science Ltd
- PIRAZZOLI, P.A. (1991). World Atlas of Holocene Sea-Level Changes. Amsterdam: Elsevier Oceanography series, 58. 300 pp.
- ROBERT, C.M. (2009). Global sedimentology of the ocean: an interplay between geodynamics and paleoenvironment. Amsterdam: Elsevier.
- STOW, D.A.V. (Ed.) (1992). Deep-water Turbidite Systems. Reprint series Volume 3 of the International Association of Sedimentologists. Oxford: Blackwell Science Ltd.
- ZAHN, R. (1994). Core correlations. Nature 371, 289-290.



Addendum to the Course Guide of the Subject

Due to the exceptional situation caused by the health crisis of the COVID-19 and taking into account the security measures related to the development of the educational activity in the Higher Education Institution teaching area, the following changes have been made in the guide of the subject to ensure that Students achieve their learning outcomes of the Subject.

Situation 1: Teaching without limited capacity (when the number of enrolled students is lower than the allowed capacity in classroom, according to the security measures taken).

In this case, no changes are made in the guide of the subject.

Situation 2: Teaching with limited capacity (when the number of enrolled students is higher than the allowed capacity in classroom, according to the security measures taken).

In this case, the following changes are made:

1. Educational Activities of Onsite Work:

All the foreseen activities to be developed in the classroom as indicated in this field of the guide of the subject will be made through a simultaneous teaching method combining onsite teaching in the classroom and synchronous online teaching. Students will be able to attend classes onsite or to attend them online through the telematic tools provided by the university (videoconferences). In any case, students who attend classes onsite and who attend them by videoconference will rotate periodically.

In the particular case of this subject, these videoconferences will be made through:

Microsoft Teams

Kaltura



Situation 3: Confinement due to a new State of Alarm.

In this case, the following changes are made:

1. Educational Activities of Onsite Work:

All the foreseen activities to be developed in the classroom as indicated in this field of the guide of the subject, as well as the group and personalized tutoring, will be done with the telematic tools provided by the University, through:

Microsoft Teams

Kaltura

Explanation about the practical sessions:



2. System for Assessing the Acquisition of the competences and Assessment System

ONSITE WORK

Regarding the Assessment Tools:

The Assessment Tools will not be modified. If onsite assessment is not possible, it will be done online through the UCVnet Campus.

The following changes will be made to adapt the subject's assessment to the online teaching.

Course guide		Adaptation	
Assessment tool	Allocated percentage	Description of the suggested changes	Platform to be used

The other Assessment Tools will not be modified with regards to what is indicated in the Course Guide.

Comments to the Assessment System: