Information about the subject

Degree: Bachelor of Degree in Marine Sciences

Faculty: Faculty of Veterinary Medicine and Experimental Sciences

Code: 270205 **Name:** Renewable energies and marine mineral resources

Credits: 6,00 **ECTS Year:** The course is not offered this academic year **Semester:** 1

Module: Optional Itinerary: Marine Environment Management, Optional Itinerary: Marine Biotechnology

Subject Matter: Renewable Energies and Marine Mineral Resources **Type:** Elective

Department: Oceanography and Environment

Type of learning: Classroom-based learning

Languages in which it is taught:

Lecturer/-s:

Module organization

Optional Itinerary: Marine Biotechnology

Subject Matter	ECTS	Subject	ECTS	Year/semester
Marine Biotechnology	6,00	Marine Biotechnology	6,00	2, 3, 4/1
Instrumental Techniques	6,00	Instrumental techniques	6,00	This elective is not offered in the academic year 25/26
Sea Food Technology	6,00	Sea Food Technology	6,00	2, 3, 4/1
Genetic Engineering	6,00	Gene Techniques	6,00	This elective is not offered in the academic year 25/26
Food Technology	6,00	Food Technology II	6,00	4/1
Food Hygiene and Safety	6,00	Food Hygiene and Safety	6,00	This elective is not offered in the academic year 25/26

Optional Itinerary: Marine Environment Management

Subject Matter	ECTS	Subject	ECTS	Year/semester
Marine Environment Geography	6,00	Geography of the marine environment	6,00	3/1
Marine Engineering	6,00	Maritime Engineering	6,00	0/1
Evaluation of Environmental Impact	6,00	Assessment of Environmental Impact	6,00	0, 2, 3, 4/1

Natural and Anthropic Risks in the Marine Environment	6,00	Natural and Anthropic Risks in the marine environment	6,00	2/1
Environmental Education	6,00	Environmental Education	6,00	2, 3, 4/1
Renewable Energies and Marine Mineral Resources	6,00	Renewable energies and marine mineral resources	6,00	This elective is not offered in the academic year 25/26

Recommended knowledge

None

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 understands and critically analyzes current energy models and their impact on industry and society.
R2	The student is able to write a comprehensible and organized document related to renewable energies and marine mineral resources.
R3	The student searches for bibliographic information from different sources ; he knows how to analyse it with a critical and constructive spirit.
R4	The student can explain the characteristics of the main renewable energies and marine mineral resources.
R5	The student knows the applications, environmental and economic aspects of mineral resources, as well as their current situation and perspectives.
R6	The student understands how Mineral Resources are related to the marine environment.
R7	The student collaborates and maintains a proactive attitude in dealing with classmates and teachers, and makes the best use of the learning tools provided: attends theoretical, practical or tutorial sessions; works in a team, etc.
R8	The student argues with rational criteria based on his/her work.

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
CB2	Students are able to apply knowledge to their work in a professional way and have the competences enabling them to state and defend views and opinions as well as perform problem-solving tasks in their field of study.			x	
CB3	Students are able to collect and interpret relevant data (generally in their field of study) and give opinions that involve reflection on relevant social, scientific or ethical issues.			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		
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
CE5	Applying marine environment use planning techniques as well as resource sustainable management			x	
CE8	Identifying and analyzing new problems and proposing solution strategies			x	
CE9	Knowing how to carry out experiments and measurements both in the laboratory and during sample collection		x		
CE10	Knowing how to use planning, designing and implementing research tools while surveying and assessing results		x		
CE11	Knowing how to do fieldwork and laboratory experiments in a safe and responsible way, promoting teamwork			x	
CE12	Describing, classifying and mapping sea bottoms and coastal areas		x		
CE13	Looking for and assessing different kinds of marine resources			x	
CE22	Practical experience of methods of marine environmental impact assessment			x	

Assessment system for the acquisition of competencies and grading system

Assessed learning outcomes	Granted percentage	Assessment method
R1, R2, R4, R5, R6, R7, R8	50,00%	Written test with theoretical and practical questions
R1, R2, R3, R4, R5, R6, R7, R8	40,00%	Delivery of guided assignments, whose objectives and contents will be proposed by the teacher
R1, R2, R3, R4, R5, R6, R7, R8	10,00%	Oral presentation

Observations

This course is not eligible for single evaluation. According to the general evaluation and qualification regulations, the preferred evaluation system will be continuous evaluation.
Attendance at practical sessions is mandatory.
The use of artificial intelligence (AI)-based tools is subject to the discretion of the teacher, who may establish specific limits or conditions depending on the training or assessment activity.

MENTION OF DISTINCTION:
In accordance with the regulations governing the assessment and grading of subjects in force at UCV, the distinction of "Matrícula de Honor" (Honours with Distinction) may be awarded to students who have achieved a grade of 9.0 or higher. The number of "Matrículas de Honor" (Honours with Distinction) may not exceed five percent of the students enrolled in the group for the corresponding academic year, unless the number of enrolled students is fewer than 20, in which case a single "Matrícula de Honor" (Honours with 9 Distinction) may be awarded. Exceptionally, these distinctions may be assigned globally across different groups of the same subject. Nevertheless, the total number of distinctions awarded will be the same as if they were assigned by group, but they may be distributed among all students based on a common criterion, regardless of the group to which they belong. The criteria for awarding "Matrícula de Honor" (Honours with Distinction) will be determined according to the guidelines stipulated by the professor responsible for the course, as detailed in the "Observations" section of the evaluation system in the course guide.

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, R3, R4, R5, R6, R7, R8	30,00	1,20
PRACTICAL CLASSES M2	R1, R2, R3, R4, R5, R6, R7, R8	12,00	0,48
LABORATORY M3	R1, R2, R3, R4, R5, R6, R7, R8	8,00	0,32
SEMINAR M4	R1, R2, R3, R4, R5, R6, R7, R8	2,00	0,08
GROUP PRESENTATION OF ASSIGNMENTS M5	R1, R2, R3, R4, R5, R6, R7, R8	2,00	0,08
TUTORIAL M6	R1, R2, R3, R4, R5, R6, R7, R8	4,00	0,16
ASSESSMENT M8	R1, R2, R3, R4, R5, R6, R7, R8	2,00	0,08
TOTAL		**60,00**	**2,40**

LEARNING ACTIVITIES OF AUTONOMOUS WORK

	LEARNING OUTCOMES	HOURS	ECTS
GROUP WORK M9	R1, R2, R3, R4, R5, R6, R7, R8	10,00	0,40
INDEPENDENT WORK M10	R1, R2, R3, R4, R5, R6, R7, R8	80,00	3,20
TOTAL		**90,00**	**3,60**

Description of the contents

Description of the necessary contents to acquire the learning outcomes.

Theoretical contents:

Content block	Contents
RENEWABLE ENERGY	RENEWABLE ENERGY
MARINE MINERAL RESOURCES	MARINE MINERAL RESOURCES. NONRENEWABLE ENERGY
Lab practices	Recognition of rocks and minerals and through a petrographic microscope
Trip	MEDITERRANEAN REGISTER (SAGGAS)

Temporary organization of learning:

Block of content	Number of sessions	Hours
RENEWABLE ENERGY	10,00	20,00
MARINE MINERAL RESOURCES	15,00	30,00
Lab practices	3,00	6,00
Trip	2,00	4,00

References

RECURSOS MINERALES MARINOS

Course Team, 1986. Resources, economics and geology: an introduction. Open University Press

David S. Cronan (ed.). 2000. Handbook of marine mineral deposits. CRC Press. Galán Huertos, Emilio. 2003. Mineralogía aplicada. Síntesis

García Guinea J. y Martínez Frías, J. (Eds.). Recursos Minerales de España. Colección Textos Universitarios. Nº 15. CSIC.

Horts D. Schulz, Matthias Zabel (Eds.). 2000. Marine Geochemistry. Springer.

Manuel Bustillo Revuelta y Carlos López Gimeno. 2000. Recursos minerales: tipología, prospección, evaluación, explotación, mineralogía, impacto ambiental. UPMadrid

Maurice E. Tucker & Paul Wright. CARBONATE SEDIMENTOLOGY. Blackwell Science.

Park, C.F. y Macdiarmid, R.A. Yacimientos minerales. OMEGA.

Rosario Lunar, R. Oyarzun. 1991. Yacimientos minerales: técnicas de estudio, tipos, evolución, metalogenia, exploración. Centro de Estudios Ramón Areces.

ENERGÍAS RENOVABLES

Gil Garcia. Energías del Siglo XXI. Mundi Prensa González Velasco J. Energías Renovables. Reverte

Juana, JM. Energías renovables para el desarrollo. Paraninfo Madrid Vicente. Energías renovables. Fundamentos tecnológicos Miguelez Pose, F. La energía que viene del mar. Netbiblo Camps, M. Los biocombustibles. Mundi Prensa

"Tecnología energética"./ Bermúdez Tamarit V.R. Valencia: Universidad Politécnica de Valencia, Servicio de Publicaciones, D.L. -2000.

"Energy"./ Gordon Aubrecht. New Jersey: Prentice Hall. -1995.

"Energía, principios, problemas y alternativas"./ Joseph Priest. Addison W. -1985. “Los biocombustibles” / Manuel Camps Michelena, Francisco Marcos Martín.- 2002

“Simulación de centrales de energía solar : Aplicación a la gestión energética” / por Manuel-Alonso Castro Gil- director de tesis: Juan Peire Arroba.- 1990

“Aprovechamientos hidroeléctricos” / Luis Cuesta Diego, Eugenio Vallarino.- 2000

“Manual de energía eólica : investigación, diseño, promoción, construcción y explotación de distinto tipo de instalaciones” / autor y coordinador, José Mª. Escudero López - colaboradores, Juan de Dios Bornay ... [etc.].- 2004

“Energía eólica” / Pedro Fernández Díez.- 1993

“Energías renovables” / Francisco Jarabo Friedrich, Nicolás Elortegui Escartín.- 2000

“Electricidad solar : ingenieria de los sistemas fotovoltaicos” / Eduardo Lorenzo - con contribuciones de Gerardo L. Araujo...[etc.].- 1994

“Energías alternativas y tradicionales : sus problemas ambientales” / Antonio Lucena Bonny.- 1998

“Minicentrales hidroeléctricas” / [director Cayetano Hernández Gonzálvez].- 1992 “Centrales eléctricas” / Angel Luis Orille Fernández.- 1995
“Centrales hidroeléctricas : teoría y problemas” / S. Rojas Rodríguez, V. Martín Tejeda.- 1997
“De la JEN al CIEMAT : energía nuclear en España” / Ana Romero de Pablos, José Manuel Sánchez Ron.- 2001
“Ocean waves and oscillating systems : linear interactions including wave-energy extraction” / Johannes Falnes.-2002
Horts D. Schulz, Matthias Zabel (Eds.). 2000. Marine Geochemistry. Springer.