COURSE GUIDE: 2016-17

DETAILS OF THE COURSE

Name:	GEODIVERSITY AND NATURAL HAZARDS		
Code:	45093214	Plan:	Environmental Sciences (Plan 2009)
Academic Year:	2016-17	Level:	Degree
Course:	3rd	Type:	Basic
Semester:	2nd		

TIME DISTRIBUTION OF SUBJECT

ECTS:	6	IN-CLASS HOURS:	45
		AUTONOMOUS WORKING HOURS:	105
		TOTAL HOURS:	150
USE OF VIRTUAL PLATFORM:			Teaching support

LECTURER

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ACTIVITIES (distributed by number of hours)

I. STUDENT ACTIVITIES (In Class / Online)	• Theory Group	26,0
	• Practice Group	19,0
	Total Hours In class/On line ...	45,0
II. STUDENT AUTONOMOUS ACTIVITIES (Not in class)	• (Teamwork, Individually)	105

	Total Hours Not In Class ...	105
TOTAL WORKING HOURS		150,0

CONTEXT

Content

This subject is divided into two distinct parts. The first part explains the interest of cultural geo-resources, geodiversity and evaluation and use of Geological Heritage.

The second part of the subject focuses on the main geological hazards. Two different groups are considered according to the genesis: Internal Geodynamic Processes like Earthquakes and Volcanoes, and External Geodynamic Processes like Landslides and Floods.

Related Subjects

Geology, Water Resources and Hydrogeology

Previous knowledge

Due to the importance of the physical environment to understand this subject, a basic geological knowledge is needed. Intermediate English level.

Prior conditions

None

COMPETENCIES AND OBJECTIVES

General Competencies

- Oral and written communication skills
- Ability to work in teams
- Ability to work independently

Others

- Application of knowledge

Specific Competencies

Being able to establish strategies for geoconservation and management of points of geological interest. Being able to assess and prevent natural hazards.

OBJETIVES/LEARNING RESULTS

To provide knowledge of cataloguing, evaluation and dissemination of geological natural heritage, from the perspective of geoconservation, both natural protected areas and those that are not still protected. To provide the necessary criteria to recognize and analyze the hazards associated to the external and internal geological processes. Ability to integrate different variables of the physical environment to quantify the risk. Ability to express and interpret cartography of natural hazards.

TABLE OF CONTENTS

Module I	GEO-RESOURCES AND GEOLOGICAL HERITAGE	
Lecture 1		
	CATALOGUING AND ASSESSMENT OF GEOLOGICAL HERITAGE Cultural Geo-Resources. PIGs and LIGs. Geosites. Geomorphosites. Geoparks. Inventories of geological heritage. Classification of geological heritage. Assessment and diagnosis of geological heritage.	
Modality	*Teaching Activities*	*Hours* *In class/On line*
Theory Group	Class of theory	5,0
Practice Group	Teamwork	1,0
Lecture 2		
	GEODIVERSITY Measure of Geodiversity. Relation between Geodiversity and Geological Heritage. Relation between Geodiversity and Biodiversity and Landscape.	
Modality	*Teaching Activities*	*Hours* *In class/On line*
Theory Group	Class of theory	3,0
Lecture 3		
	GEOCONSERVATION Vulnerability of geological heritage. Risk of geological heritage degradation. Geoconservation threats. International programs. Summary of Mational and Andalusian legislation. Divulgation of Geodiversity and Geological Heritage. Geoconservation and Climate Change.	
Modality	*Teaching Activities*	*Hours* *In class/On line*
Theory Group	Class of theory	3,0
Practice Group	Fieldwork	5,0
Lecture 4		
	SINGULAR GEOLOGICAL HERITAGE Geomorphological heritage. Mineralogical heritage. Paleontological heritage. Examples: Megacrystals of Naica. The giant Geode of Pulpi. Gypsum Karst of Sorbas. Ichnofossils and dinosaurs.	
Modality	*Teaching Activities*	*Hours* *In class/On line*
Theory Group	Class of theory	2,0
Practice Group	Fieldwork	3,5
Module II	GEOLOGICAL HAZARDS	

Lecture 1		
	GEOLOGICAL HAZARDS Introduction. Basic concepts. Planning geological hazards. Hazards in the world. Situation in Europe. Situation in Spain. The economic value of geological hazards. Hazards Mitigation: Prediction, Forecasting, Prevention.	
Modality	*Teaching Activities*	*Hours* *In class/On line*
Theory Group	Class of theory	2,0
Lecture 2		
	HAZARDS LINKED TO THE INTERNAL GEODYNAMICS Volcanic activity. The spatial location of volcanism. Types of magma. Eruptive mechanisms. Monitoring and prevention of volcanic hazards. Earthquakes and related phenomena. The geotectonic regime and seismicity. Earthquakes Prevention. Tsunamis.	
Modality	*Teaching Activities*	*Hours* *In class/On line*
Theory Group	Class of theory	6,0
Practice Group	Study of cases	2,0
Lecture 3		
	HAZARDS LINKED TO THE EXTERNAL GEODYNAMICS **Slope movements.** Individual particles movements. Mass movements. Factors contributing to landslides. Criteria for making hazard maps. Prevention and correction. **Flooding.** Origin of flooding. The discharge and measurement. The hydrograph. Maximum discharge and recurrence interval. Prediction and prevention. **Coastal Processes**.	
Modality	*Teaching Activities*	*Hours* *In class/On line*
Theory Group	Class of theory	5,0
Practice Group	Fieldwork	7,5

EVALUATION OF COMPETENCIES
Evaluation criteria
The theoretical knowledge acquired by students will be assessed by means of tests. The practical knowledge will be assessed with the student portfolio corresponding to field trips and laboratory practices. The written communication skills will be assessed from material collected during the course of the subject. The oral communication ability will be assessed through oral presentations that students should prepare in teamwork.

The self-criticism will be assessed from participation during the theoretical lessons.

WORKING HOURS OF THE STUDENT

	Activity	*(No. hours)*	*Percentage*
I. STUDENT ACTIVITIES (In Class / Online)	• Theory Group	(26)	65 %
	• Practice Group	(19)	25 %
II. STUDENT AUTONOMOUS ACTIVITIES (Not in class)	• AUTONOMOUS WORKING HOURS (not in-class, estimated)	(105)	10 %

Guidelines for Assessment

- Tests, exercises, problems.
- Essays, presentations, etc.
- Final multiple choice test.
- Student portfolio.
- (*): IT'S NECESSARY TO GET 4 POINTS IN THE FINAL TEST TO TAKE INTO ACCOUNT THE MARKS FROM THE OTHER ACTIVITIES.

Control System

- Virtual Platform Access
- To participate in communication tools (forum, chat, email)
- Delivery of classroom activities
- Delivery of virtual classroom activities

BIBLIOGRAPHY

Recommended Books

- Geodiversity: Valuing and Conserving Abiotic Nature *(Murray Gray)*
- Geoheritage in Europe and its conservation *(Wimbledon, W.A.P. & Smith-Meyer, S)*
- Geología y Prevención de daños por inundaciones *(ITGE)*
- Geological hazards: earthquakes, tsunamis, volcanoes, avalanches, landslides, floods *(BOLT, B.A et al.)*
- Guía ciudadana de los Riesgos Geológicos *(AIPG y ICOG)*
- Importancia Socioeconómica de los Riesgos Geológicos en España *(AYALA-CARCEDO, F. et al.)*
- Landslides *(CHACÓN, J. ; IRIGARAY, C. & FERNÁNDEZ, T. (Editores))*
- Patrimonio geológico y geodiversidad: investigación, conservación, gestión y relación con los espacios naturales protegidos *(Carcavilla, L., López-Martínez, J. y Durán, J.J.)*
- Riesgos Geológicos *(ITGE)*
- Riesgos naturales: procesos de la Tierra como riesgos, desastres y catástrofes (con Cd-rom) *(BLODGETT, R., KELLER, E.)*

Bibliography at the UAL Library
It can be found at: http://almirez.ual.es/search/x?SEARCH=45093214

WEBSITES

- http://www.igme.es/internet/patrimonio/novedades/METODOLOGIA%20IELIG%20V12.pdf
  IGME, 2009. Documento metodológico para la elaboración del inventario español de lugares de interés.
- http://www.juntadeandalucia.es/medioambiente
  Junta de Andalucía, 2011. Inventario Andaluz de Georrecursos
- https://geohazards.usgs.gov/
  USGS Geologic Hazards Science Center