

## COURSE GUIDE: 2017-18

### DETAILS OF THE COURSE

Name:	GEODIVERSITY AND NATURAL HAZARDS		
Code:	45093214	Plan:	Environmental Sciences (Plan 2009)
Academic Year:	2017-18	Level:	Degree
Course:	3 <sup>rd</sup>	Type:	Basic
Semester:	2 <sup>nd</sup>		

### TIME DISTRIBUTION OF SUBJECT

ECTS:	6	IN-CLASS HOURS:	45
		AUTONOMOUS WORKING HOURS:	105
		TOTAL HOURS:	150

USE OF VIRTUAL PLATFORM:	Teaching support
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### LECTURER

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### 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.

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<b>Related Subjects</b>
Geology, Water Resources and Hydrogeology
<b>Previous knowledge</b>
Due to the importance of the physical environment to understand this subject, a basic geological knowledge is needed. Intermediate English level.
<b>Prior conditions</b>
None

<b>COMPETENCIES AND OBJECTIVES</b>
<b>General Competencies</b>
<ul style="list-style-type: none"> <li>• Oral and written communication skills</li> <li>• Ability to work in teams</li> <li>• Ability to work independently</li> </ul>
<i>Others</i>
<ul style="list-style-type: none"> <li>• Application of knowledge</li> </ul>
<b>Specific Competencies</b>
Being able to establish strategies for geoconservation and management of points of geological interest. Being able to assess and prevent natural hazards.
<b>OBJETIVES/LEARNING RESULTS</b>
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.

<b>TABLE OF CONTENTS</b>	
<b>Module I</b>	<b>GEO-RESOURCES AND GEOLOGICAL HERITAGE</b>
	<b>CATALOGUING AND ASSESSMENT OF GEOLOGICAL HERITAGE</b> Cultural Geo-Resources. PIGs and LIGs. Geosites. Geomorphosites. Geoparks. Inventories of geological heritage. Classification of geological heritage. Assessment and diagnosis of geological heritage.
	<b>GEODIVERSITY</b> Measure of Geodiversity. Relation between Geodiversity and Geological Heritage. Relation between Geodiversity and Biodiversity and Landscape.
	<b>GEOCONSERVATION</b> 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

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	Climate Change.	
	<b>SINGULAR GEOLOGICAL HERITAGE</b> Geomorphological heritage. Mineralogical heritage. Paleontological heritage. Examples: Megacrystals of Naica. The giant Geode of Pulpi. Gypsum Karst of Sorbas. Ichnofossils and dinosaurs.	
<b>Module II</b>	<b>GEOLOGICAL HAZARDS</b>	
	<b>GEOLOGICAL HAZARDS</b> 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.	
	<b>HAZARDS LINKED TO THE INTERNAL GEODYNAMICS</b> 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.	
	<b>HAZARDS LINKED TO THE EXTERNAL GEODYNAMICS</b> <b>Slope movements.</b> Individual particles movements. Mass movements. Factors contributing to landslides. Criteria for making hazard maps. Prevention and correction. <b>Flooding.</b> Origin of flooding. The discharge and measurement. The hydrograph. Maximum discharge and recurrence interval. Prediction and prevention. <b>Coastal Processes.</b>	
<i>Modality</i>	<i>Teaching Activities</i>	
Theory Group	Class of theory	
Practice Group	Fieldwork	

## 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.

### Control System

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

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- 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*

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