SUBJECT TEACHING GUIDE

540 - Tools for Risk Assessment

Master's Degree in Coasts and Ports

Academic year 2023-2024

1. IDENTIFYING DATA

Degree	Master's Degree in Coasts and Ports		Type and Year	Optional. Year 1
Faculty	School of civil Engineering			
Discipline				
Course unit title and code	540 - Tools for Risk Assessment			
Number of ECTS credits allocated	3	Term	Semester based (2)	
Web				
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. CIENCIAS Y TECNICAS DEL AGUA Y DEL MEDIO AMBIENTE
Name of lecturer	JAVIER MARIA SANCHEZ ESPESO
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Office	E.T.S. de Ingenieros de Caminos, Canales y Puertos. Planta: + 2. DESPACHO PROFESOR (2037)
Other lecturers	

3.1 LEARNING OUTCOMES

- Terminology and basic concepts about Geographic information systems.
- Analysis tools in vector and raster environments
- Management and modeling digital terrain models.
- Using models of spatial interpolation
- Case studies risk assessment: geological, hydrometeorological and surface water contamination.
- Be able to evaluate the different components of risk: hazard, vulnerability, exposure, etc.
- Know the main tools and methodologies for assessing the risk generated both on human resources, as on the economy and aquatic ecosystems.
- Know the major spatial and temathic data infrastructure (SDI)

4. OBJECTIVES
Know and manage spatial information using the tools and methodologies of GIS.
Based on the spatial and thematic data available, be able to manage it adequately to obtain adequate exposure, vulnerability and risk indicators.
Design, develop and interpret spatial information analysis using GIS methodologies aimed at risk assessment in Coastal and Port scenarios.

6. COURSE ORGANIZATION

CONTENTS

1	Vector GIS. Concepts. Components. Digital mapping. Alphanumeric databases. Introduction to the working environment: basic functionality. Preparation of GIS data model. Edition. Topology. Catalog of basic analysis tools. Reference systems. Automation.
2	Raster GIS. Basic concepts. Basic analysis tools: queries, classification, map algebra functions. Three-dimensional terrain models. Spatial analysis and modeling of continuous variables. Interpolation models
3	Case studies in the risk assessment.

7. ASSESSMENT METHODS AND CRITERIA				
Description	Type	Final Eval.	Reassessn	%
Vector GIS projects	Work	No	No	20,00
Raster GIS projects	Work	No	No	20,00
Final Project	Work	Yes	Yes	50,00
Final exam	Activity evaluation with Virtual Media	Yes	No	10,00
TOTAL				100,00
Observations				
For the presentation of the work will be compulsory to attend 70% of classes Only for duly justified causes (eg sanitary restrictions), the evaluations may be organized remotely, with prior authorization from the Center's Directorate.				
Observations for part-time students				
Part-time students will apply the same assessment criteria as full-time students. The temporary distribution of activities will be adapted to the particular conditions of each student when deemed necessary.				

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

HARMON, J.E. y ANDERSON, S. 2003. The design and Implementation of Geographic Information Systems. John Wiley & Sons, Hoboken, New Jersey.

BERNHARDSEN, T. 2002. Geographic Information Systems. John Wiley & Sons, New York.

BOSQUE SENDRA, J. 2000. Sistemas de Información Geográfica. 3ª Ed. Rialp, Madrid.

BURROUGH, P.A y MCDONNELL, R. 1998. Principles of Geographical Information Systems (Spatial Information Systems and Geostatistics). Oxford University Press. Oxford.

LONGLEY, P.A., GOODCHILD, M.F., MAGUIRE, D.J. y RHIND, D.W. 2005. Geographic Information Systems and Science. 2ª Ed. John Wiley & Sons. Chichester.