

SUBJECT TEACHING GUIDE

G184 - Geographic Information Systems II (Vector-Based)

Degree in Geography and Land Planning

Academic year 2024-2025

1. IDENTIFYING DATA					
Degree	Degree in Geography and Land Planning			Type and Year	Compulsory. Year 3
Faculty	Faculty of Humanities				
Discipline	Technical Fundamentals in Geography and Land Use Planning Technical Subjects in Geography				
Course unit title and code	G184 - Geographic Information Systems II (Vector-Based)				
Number of ECTS credits allocated	6	Term	Semester based (2)		
Web					
Language of instruction	English	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. GEOGRAFIA, URBANISMO Y ORDENACION DEL TERRITORIO				
Name of lecturer	PABLO FERNANDEZ DE ARROYABE HERNAEZ				
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Office	E.T.S. de Ingenieros de Caminos, Canales y Puertos. Planta: + 2. DESPACHO (2046)				
Other lecturers					

3.1 LEARNING OUTCOMES
<ul style="list-style-type: none"> --Students will be able to transform a geographic problem into a logic model in the computer. -Students will acquire the ability to edit the spatial and non-spatial components of a thematic map. -Students will understand and be able to distinguish the CAD edition from GIS edition modes. -Students will have the ability to understand topological rules in vectorial formats with an Arc-Node data structure. - Students will have the ability to create SQL expressions and apply selection functions in a complex GIS environment . - Students will know how to use spatial analysis tools in order to solve different geographical problems . - Students will know how to elaborate final layouts based on projects related to the use of GIS

4. OBJECTIVES

The main aim is to facilitate students the acquisition of theoretical knowledge and technical abilities that allow them to design and develop and GIS project according to a correct methodology.

6. SUBJECT PROGRAM

CONTENTS

1	<p>MODULE 1. SCIENCE AND GEOGRAPHIC INFORMATION TECHNOLOGIES</p> <p>1.1 Digital revolution and geographic information</p> <p>1.2 Geographic data adquisition and management</p> <p>1.3 Vectorial data structures</p>
2	<p>MODULE 2. ARCGIS PLATFORM</p> <p>2.1 ArcGIS Desktop, ArcGIS Pro, ArcGIS Online</p> <p>2.2 Spatial reference systems in ArcGis</p> <p>2.3 Georeferencing functions</p> <p>2.4 The edition of vectorial maps</p>
3	<p>MODULE 3. GEOPROCESSING TOOLS AND DATA ANALYTICS</p> <p>3.1 Basic queries and selection functions</p> <p>3.2 Spatial selections and unions</p> <p>3.3 Advance geoprocessing tools in ArcGIS</p> <p>3.4 Exploring the third dimension in ArcGIS</p> <p>3.5 The geostatistical methods in ArcGIS</p>
4	<p>MODULE 4. PLANNING YOUR GIS PROJECT</p> <p>4.1 Defining the aims</p> <p>4.2 Theoretical design of a spatial database</p> <p>4.3 Technical implementation of theoretical design</p> <p>4.4 Presenting and displaying results</p>
5	<p>MODULE 5. BIG DATA AND GEOGRAPHIC INFORMATION</p> <p>5.1 The added value of spatial Big Data</p> <p>5.2 ETL-OLAP Tools</p> <p>5.3 GIS and Cloud Computing</p> <p>5.4 Artificial inteligence and GIS</p>

7. ASSESSMENT METHODS AND CRITERIA				
Description	Type	Final Eval.	Reassessn	%
Practical exam in the computer about the practical work developed during the semester in class	Laboratory evaluation	Yes	Yes	40,00
Test based on a multiple choice questionnaire. Wrong answers will give negative points.	Written exam	Yes	Yes	20,00
Continuous assessment will be carry out through the virtual platform of the course.	Activity evaluation with Virtual Media	No	Yes	40,00
TOTAL				100,00
Observations				
Theoretical exam will be a multiple choice questionnaire and wrong answers will count negatively. Exams could be substituted by virtual exams or virtual tasks assessments if the public health circumstances would require it In the event that the health situation forces to modify the face-to-face conditions towards a scenario 2 (mixed teaching) or a scenario 3 (virtual teaching), the assistance will be verified by means of the tools available on the UC institutional platforms (connection time , student responses in MOODLE chats and forums, video calls etc ...)				
Observations for part-time students				
Part-time students, or those who justifiably cannot follow the continuous assessment, may be evaluated through the delivery of a work that will be agreed with the professor responsible for the subject. Attendance is mandatory in the case of field activities				

8. BIBLIOGRAPHY AND TEACHING MATERIALS
BASIC
BOSQUE SENDRA, J. (1992) Sistemas de Información Geográfica. Ed. Rialp, S.A. Madrid
LONGLEY, P. A.; GOODCHILD, M.F.; MAGUIRRE, D.J.; RHIND, D.W. (2011) Geographic Information Systems & Science. Ed. WILEY.
COMAS, D. RUIZ, E. (1993) Fundamentos de los Sistemas de Información Geográfica. Ed. Ariel, S.A. Barcelona.
FERNANDEZ DE ARROYABE HERNAEZ, P. (2003) Sistemas de Información Geográfica Vectoriales: ejercicios prácticos bajo una estructura de datos Arco-Nodo. Santander, TGD, SL. Pag.150
FERNANDEZ DE ARROYABE HERNAEZ, P. (2003) Sistemas de información geográfica vectoriales: ejercicios prácticos bajo una estructura de datos Arco-Nodo. TGD, Santander.
FERNANDEZ DE ARROYABE HERNAEZ, P. (2018) Del "geographical feature" al "dataset" en ArcGis: modelización y análisis geográfico. TGD, Santander (con CD de ejercicios).