SUBJECT TEACHING GUIDE

343 - Computation in CAD and GIS Environments

Master's Degree in Mathematics and Computing

Academic year 2023-2024

1. IDENTIFYING DATA

Degree	Master's Degree in Mathematics and Computing		Type and Year	Optional. Year 1
Faculty	Faculty of Sciences			
Discipline				
Course unit title and code	343 - Computation in CAD and GIS Environments			
Number of ECTS credits allocated	3	Term	Semester based (1)	
Web	https://moodle.unican.es/login/index.php			
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. INGENIERIA GEOGRAFICA Y TECNICAS DE EXPRESION GRAFICA
Name of lecturer	VALENTIN GOMEZ JAUREGUI
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Other lecturers	JOSE ANDRES DIAZ SEVERIANO

3.1 LEARNING OUTCOMES

- Knowledge of the main components of a general purpose system of Computer Aided Design (CAD).
- Applied knowledge of a general purpose library of Computer Aided Design (CAD).
- Knowledge of the main components of a general purpose Geographic Information System (GIS).
- Applied knowledge of a general purpose library of a Geographic Information System (GIS).
- Knowledge and skills in the use of algorithms and basic structures for writing own software in CAD and GIS environments.
- Ability to integrate CAD and GIS computing modules in more general or more specific purpose applications.

4. OBJECTIVES

Knowledge of the main components of a general purpose system of Computer Aided Design (CAD).
Applied knowledge of a general purpose library of Computer Aided Design (CAD).
Knowledge of the main components of a general purpose Geographic Information System (GIS).
Applied knowledge of a general purpose library of a Geographic Information System (GIS).
Knowledge and skills in the use of algorithms and basic structures for writing own software in CAD and GIS environments.
Ability to integrate CAD and GIS computing modules in more general or more specific purpose applications.
Learning basic concepts and developing simple but relevant software to model geometric entities
Knowledge of several problems of geometrical information processing (curves on surfaces, data transfer ...), designing and using methods and computer programs for solving them.

6. COURSE ORGANIZATION

CONTENTS	
1	PROGRAMMING IN CAD / CAE ENVIRONMENT. - CAD / CAE systems. Main elements. CAD / CAE in the engineering office. - User interface, major commands and techniques. - Developer interface. Object model specification. Integration of basic techniques of CAD / CAE programming. Specification and design of the application user interface. - Algorithms, structures and basic programming functions for: object creation, editing, properties, selection, filtering. Basic applications.
2	PROGRAMMING IN GIS ENVIRONMENT. - Geographic Information Systems. Main elements. The use of GIS in science and technology. - User interface. Overview of GIS. Basic techniques in a GIS. - Developer interface. Object specification. Integration of basic techniques. User interface development of a GIS application. - Algorithms, structures and basic programming functions for: connection to data sources, creating map windows, creation of data windows, queries and filters. Spatial analysis. Basic applications.

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
TASKS OF PROGRAMMING IN CAD ENVIRONMENT	Work	No	Yes	25,00
TASKS OF PROGRAMMING IN GIS ENVIRONMENT	Work	No	Yes	25,00
MONITORING OF ON-CAMPUS ACTIVITIES	Others	No	No	50,00
TOTAL				100,00
Observations				
Class attendance is necessary for monitoring on-campus activities				
Observations for part-time students				
Part-time students must address the responsible teacher the first day of the course to receive the appropriate instructions. They shall be entitled to submit a single evaluation process. If properly justified the impossibility to attend the lectures, they will have to submit a supplementary task.				

8. BIBLIOGRAPHY AND TEACHING MATERIALS
BASIC
Curso Moodle de la asignatura: https://moodle.unican.es/login/index.php
OCW http://ocw.unican.es/ensenanzas-tecnicas/cad-3d/programa
Modelo de objetos de las aplicaciones AutoCAD
Manual del desarrollador de AutoCAD
Manual del desarrollador de Python