

Course guide

310618 - 310618 - Geographic Information Systems

Last modified: 29/01/2024

Unit in charge:	Barcelona School of Building Construction	
Teaching unit:	751 - DECA - Department of Civil and Environmental Engineering.	
Degree:	BACHELOR'S DEGREE IN GEOINFORMATION AND GEOMATICS ENGINEERING (Syllabus 2016). (Compulsory subject).	
Academic year: 2023	ECTS Credits: 6.0	Languages: Spanish

LECTURER

Coordinating lecturer:	Mercedes Sanz Conde
Others:	Mercedes Sanz Conde

PRIOR SKILLS

Ability to manage any software tool. Be able to manage any kind of cartographic document easily. Teamwork will be highly valued.

REQUIREMENTS

To have passed the subject Digital Cartography.

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

4. Design and develop geomatic and topographic projects.
5. (ENG) Determinar, mesurar, avaluar i representar el terreny, objectes tridimensionals, punts i trajectòries.
6. (ENG) Reunir i interpretar informació del terreny i tota aquella relacionada geogràficament i econòmicament amb ell.
7. (ENG) Planificació, projecte, direcció, execució i gestió de processos de mesura, sistemes d'informació, explotació d'imatges, posicionament i navegació; modelització, representació i visualització de la informació territorial en, sota i sobre la superfície terrestre.
8. (ENG) Planificació, projecte, direcció, execució i gestió de processos i productes d'aplicació a l'enginyeria medioambiental, agronòmica, forestal i minera, dins l'àmbit geomàtic.
9. (ENG) Planificació, projecte, direcció, execució i gestió de processos i productes d'aplicació a la societat de l'informació dins l'àmbit geomàtic.
10. (ENG) Planificació, projecte, direcció, execució i gestió de processos i productes d'aplicació en cadastre i registre, ordenació del territori i valoració, dins l'àmbit geomàtic.
11. Knowledge, use and application of the treatment techniques. Analysis of special data. Study of models applied to the engineering and architecture.
12. Design, production and diffusion of the basic cartographic; implementation, management and exploitation of Geographic Information Systems (SIG).
13. Knowledge about application of the geomatic methods and techniques in the scope of the different engineering.

Transversal:

1. EFFECTIVE USE OF INFORMATION RESOURCES - Level 2. Designing and executing a good strategy for advanced searches using specialized information resources, once the various parts of an academic document have been identified and bibliographical references provided. Choosing suitable information based on its relevance and quality.
2. TEAMWORK - Level 1. Working in a team and making positive contributions once the aims and group and individual responsibilities have been defined. Reaching joint decisions on the strategy to be followed.
3. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 3. Communicating clearly and efficiently in oral and written presentations. Adapting to audiences and communication aims by using suitable strategies and means.

TEACHING METHODOLOGY

Master class
Expositive participative class
Laboratory
Team work
Autonomous work
Realization of the evaluation

LEARNING OBJECTIVES OF THE SUBJECT

The student should be able to interpret and perform cartographic documents, understand and apply GIS for spatial data analysis over the territory and its representation. Cartographic issue technical report.

STUDY LOAD

Type	Hours	Percentage
Hours large group	24,0	16.00
Hours medium group	36,0	24.00
Self study	90,0	60.00

Total learning time: 150 h

CONTENTS

Theme1: Process with raster data.

Description:

Spatial Analysis with raster data.

Specific objectives:

Know and apply the main analytical tools for raster data.

Related activities:

Activity 1

Full-or-part-time: 16h

Theory classes: 6h

Self study : 10h

Theme 2: Modelbuilder.

Description:

Learning the visual language Modelbuilder to do vector and raster processes.

Related activities:

Activity 2.

Full-or-part-time: 16h

Theory classes: 6h

Self study : 10h



Theme 3: ArcGIS PRO Extensions.

Description:

Extensions with ArcGIS PRO.

Specific objectives:

Learning the Arcgis PRO program and its use for different data.

Related activities:

Activity 3.

Full-or-part-time: 20h

Theory classes: 10h

Self study : 10h

ACTIVITIES

Activity 1

Description:

Raster analysis.

Specific objectives:

Spatial Queries.

Material:

Software ArcGIS

Delivery:

Results report of raster analysis.

Full-or-part-time: 18h

Practical classes: 8h

Self study: 10h

Activity 2

Description:

Modelbuilder

Specific objectives:

Choose the tools suitable for a given analysis.

Material:

Software SIG

Delivery:

Results report of tool for Modelbuilder.

Full-or-part-time: 18h

Practical classes: 8h

Self study: 10h



Activity 3

Description:

ArcGIS PRO:extrensions.

Specific objectives:

Choose the tools suitable for a given analysis.

Material:

Software GIS

Delivery:

Results report with ArcGIS PRO.

Full-or-part-time: 16h

Practical classes: 6h

Self study: 10h

GRADING SYSTEM

Week 8/9: practical exam 40%. Partial exam.

Week 15: practical exam 40%. Final exam.

Extensions of ArcGIS PRO 15%

Delivery of practices 5%

Week 20: Reevaluation.

EXAMINATION RULES.

All of them, exams and practices, are required. The minimum grade to pass/clear the subject of an exam is a 4. The exam percentages will be applied if the minimum exam grade is a 4.

BIBLIOGRAPHY

Basic:

- ESRI. Tutoriales online ArcGIS PRO [on line]. [Consultation: 05/07/2022]. Available on: <https://pro.arcgis.com/es/pro-app/get-started/pro-quickstart-tutorials.htm>.
- Bosque Sendra, Joaquín. Sistemas de información geográfica. 2ª ed. Madrid: Rialp, 1997. ISBN 8432131547.
- Aronoff, Stanley. Geographic information systems : a management perspective. Ottawa, Canadá: WDL Publications, 1989. ISBN 0921804911.
- Laurini, Robert ; Thompson, Derek. Fundamentals of spatial information systems. Londres: Academic Press, 1992. ISBN 0-12-438380-7.
- Moreno Jiménez, Antonio [et al.]. Sistemas y análisis de la información geográfica : manual de autoaprendizaje con ArcGIS. 2ª ed. Madrid: RA-MA, 2007. ISBN 9788478978380.

RESOURCES

Computer material:

- ArcGIS Desktop. Resource
- ArcGIS PRO. Resource

Other resources:

QGIS