

Academic Year/course: 2022/23

60423 - Introduction to Geographic Information Systems

Syllabus Information

Academic Year: 2022/23

Subject: 60423 - Introduction to Geographic Information Systems

Faculty / School: 103 - Facultad de Filosofía y Letras

Degree: 352 - Master's in Geographic Information Science and Technology for Land Management: Geographic Information Systems and Remote Sensing

ECTS: 2.0

Year: 1

Semester: Annual

Subject Type: Optional

Module:

1. General information

2. Learning goals

3. Assessment (1st and 2nd call)

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

The learning and teaching methodology developed in the course is aimed to promote the achievement of the learning objectives. The course has a predominantly theoretical character, thus teaching and learning activities are developed using the lecture approach. In addition, several practical activities are also scheduled, always related to the theoretical and conceptual aspects of GIS.

Extensive material will be available *via* the Moodle site of the course. This offers a variety of resources including a repository of the lecture notes used in class, a course syllabus as well as other forms of course-specific materials, including a discussion forum.

4.2. Learning tasks

The course includes the following learning tasks:

- Lectures: 12.5 hours
- Practical activities: Interactive, individual or group activities: 7.5 hours
- Study: 28 hours
- Assessment: 2 hour

4.3. Syllabus

The course will address the following topics:

Topic 1. Context, definition and components of GIS

- Social, scientific and technological development of GIS context.
- Definitions and the elements of GIS.

Topic 2. The nature of geographic information and its representation in GIS

- The nature of geographic information and its contents.
- Principles, concepts and elements of modeling of geographic information in GIS.
- Data models in GIS: vector and raster.

Topic 3. Collection and organization of data: database creation and maintenance of spatial and thematic data

- Information sources in the GIS.
- Capturing and editing spatial databases.
- Principles and techniques for creating thematic databases.
- Sources, meaning and treatment of errors.

Topic 4. GIS and geographical analysis: basic concepts.

- Organization and dimensions of the data
- The process of data analysis: stages and activities
- Analysis procedures. Cartographic modeling
- Geometric transformations. Changes of the scale of measurement of attributes
- Typology of analytical functions of GIS

Topic 5. Visualizing data in GIS

- Communication by graphic systems as a cognitive process
- Elaboration of graphs in GIS
- Cartographic modeling and mapping with GIS
- Other documents to visualize geographical information

4.4. Course planning and calendar

The sessions (20 hours) are developed, during the first month of the academic year prior to those of the course "Introduction to geographic information technologies" in which the management of specific computer programs for GIS is addressed. For this course the student should not submit any work, being only subject to a written test.

4.5. Bibliography and recommended resources

- Bosque Sendra, Joaquín. Sistemas de información geográfica / Joaquín Bosque Sendra . - 2a. ed. corr. Madrid : Rialp, 1997
- Bernhardsen, Tor. Geographic information systems : an introduction / Tor Bernhardsen . - 3rd ed. New York : John Wiley & Sons, cop. 2002
- Comas, David. Fundamentos de los sistemas de información geográfica / David Comas y Ernest Ruiz Barcelona : Ariel, 1993
- Geographic information system and science / Paul A. Longley [et. al] . - 2nd ed. Chichester : John Wiley & Sons, cop. 2005
- Encyclopedia of GIS / Shashi Shekar, Hui Xiong (Eds.) New York : Springer, cop. 2008
- Albrech, J.. Key Concepts & Techniques in GIS / J. Albrech. London : Sage Publication, 2007
- Quirós Hernández, M.. Tecnologías de la Información Geográfica (TIG). Cartografía, fotointerpretación, teledetección y SIG / M. Quirós Hernández Salamanca : Universidad de Salamanca, 2011
- Gutiérrez Puebla, Javier. SIG : Sistemas de Información Geográfica / Javier Gutiérrez Puebla, Michael Gould . 1a. reimp Madrid : Síntesis, 2000