

Course guide

310623 - 310623 - Design and Implementation of Geoservices

Last modified: 16/11/2023

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:** Catalan, Spanish

LECTURER

Coordinating lecturer: Mercedes Sanz Conde

Others: Juan Carlos González González

PRIOR SKILLS

Complete learning of a GIS.

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

CE17EGG. Knowledge, use and application of instruments and photogrametric and topographic methods appropriate to the realization of non cartographic raisings.

Generical:

CG1EGG. Design and develop geomatic and topographic projects.

CG4EGG. Capacity to take decisions, leadership, management of human resources and direction of interdisciplinary teams related with the special information.

CG5EGG. Determine, measure, evaluate and represent the ground, tridimensional objects, points and trajectories.

CG6EGG. Reunite and interpret information of the ground and all of this geographic and economically related with the ground.

CG7EGG. Management and execution of investigation projects, development and innovation inside the scope of this engineering.

CG8EGG. Planification, project, direction, execution and management of measurements processes, information systems, image exploitation, positioning and navigation; modeling, representation and visualization of the territorial information in, under and above the ground surface.

CG10EGG. Planning, project, direction, execution and management of processes and products of application in the environment, agronomy, forest and miner engineering inside the geomatic field

Transversal:

CT3. TEAMWORK: Being able to work in an interdisciplinary team, whether as a member or as a leader, with the aim of contributing to projects pragmatically and responsibly and making commitments in view of the resources that are available.

CT4. EFFECTIVE USE OF INFORMATION RESOURCES: Managing the acquisition, structuring, analysis and display of data and information in the chosen area of specialisation and critically assessing the results obtained.

CT5. FOREIGN LANGUAGE: Achieving a level of spoken and written proficiency in a foreign language, preferably English, that meets the needs of the profession and the labour market.

Basic:

CB2EGG. The students must know how to apply their knowledge to the work or vocation in a professional way and possess the competences that are used to be demonstrated by the elaboration and defense of arguments and the resolution of problems inside their own field of study.

CB3EGG. The students must have the capacity to gather and interpret relevant data (normally inside the field of study) to emit judgements that include a reflexion into relevant social, scientific or ethic contents.

TEACHING METHODOLOGY

Master classes.
Participative expository classes.
Laboratory practice.
Autonomous work.
Teamwork.

LEARNING OBJECTIVES OF THE SUBJECT

Development of mapping for Web.
Learning Python.
Flow of geoprocesses.

STUDY LOAD

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

Total learning time: 150 h

CONTENTS**1: Internet protocols and Web services.****Description:**

This first topic of the subject deals with the study of the stack of TCP/IP protocols that form the basis on which multiple higher-level protocols are articulated, including the HTTP protocol and its HTTPS variant. In addition, there will be an incursion into the protocols for the transmission of information in XML or JSON format, as in the case of SOAP and REST, respectively.

Specific objectives:

Basic learning protocols of internet.

Full-or-part-time: 9h

Practical classes: 6h

Self study : 3h

2. Types of geoserveis and protocols.

Description:

The second topic of this subject is about the study of the main types of existing geoservices (WMS, WFS, WMTS, WCS, CSW, WPS, etc.) and the information transmission protocols they use (KVP, SOAP and REST).

Specific objectives:

Geoservices.

Related activities:

Activity 1

Full-or-part-time: 16h

Practical classes: 6h

Self study : 10h

3. Python language.

Description:

Learning Python programming language, aimed at automating processes that deal with geographic information.

Specific objectives:

Process automation.

Related activities:

Activity 1.

Full-or-part-time: 45h

Practical classes: 15h

Self study : 30h

4. Publishing geoservices with ArcGIS Server and Geoserver.

Description:

Study of the implementation of different types of geoservices, through the capabilities of the ArcGIS Server and Geoserver platforms.

Specific objectives:

Learning of the ArcGIS Server and Geoserver platforms.

Related activities:

Activity 2.

Full-or-part-time: 16h

Theory classes: 6h

Self study : 10h

5.Geoservices with FME Server.

Description:

Data processing geoservices,with FME Server.

Specific objectives:

FME Server.

Related activities:

Activity 3.

Full-or-part-time: 16h

Practical classes: 6h

Self study : 10h

ACTIVITIES

Activity 1:Programming a Python application.

Description:

Develop an application that allows you to perform different analyzes with geographic data and generate a service in ArcGIS Server.

Material:

PyCharm, ArcGIS Pro and ArcGIS Server

Full-or-part-time: 13h

Practical classes: 11h

Self study: 2h

Activity 2.Creation of REST, WMS, WFS and WPS services with ArGIS Server and Geoserver.

Description:

Take in knowledge of WPS services and their implementation through the two platforms. The services will be created and the student will have to make a comparison of both.

Material:

ArcGIS Pro, ArcGIS Server and Geoserver.

Full-or-part-time: 13h

Practical classes: 11h

Self study: 2h



Activity 3: Creation of processing services with FME Server.

Description:

Publishing geoprocessing services created with FME Desktop and published with FME Server.

Material:

FME Desktop and FME Server.

Delivery:

Delivery of practice.

Full-or-part-time: 13h

Practical classes: 2h

Self study: 11h

GRADING SYSTEM

Theoric_practical exam: 25% , date: 27th October 2023

Theoric_practical exam. 25%, date: 9th January 2024

Reassessment; 22th January 2024

Activity 1: 20%

Activity 2: 10%

Activity 3: 20%

You will not be able to access the reassessment with a grade lower than 3.5, nor those who have not presented all the practices.

The reassessment exam will cover the entire subject.

Attendance and class work will be valued.

EXAMINATION RULES.

All evaluation tests are mandatory.

BIBLIOGRAPHY

Basic:

- Jennings, Nathan. A Python Primer for ArcGIS. Workbook II. Great Britain: Amazon, 2015. ISBN 9781505893441.
- Fu, Pindie. Getting to know Web GIS. Redlands, California: ESRI Press, 2015. ISBN 9781589483842.
- Jennings, Nathan. A Python Primer for ArcGIS. Workbook 1. Lexington, Kentucky: Nathan Jennings, 2015. ISBN 9781466274594.

RESOURCES

Computer material:

- ArcGIS for Server. Software
- ArcGIS for Desktop. Software
- FME Desktop. FME Desktop.