Course guide
310633 - 310633 - Spatial Data Infrastructure

Last modified: 21/11/2023

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:** Spanish

LECTURER

Coordinating lecturer: MARIA AMPARO NUÑEZ ANDRES

Others: MARIA AMPARO NUÑEZ ANDRES

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
1. (ENG) Capacitat per a la presa de decisions, de lideratge, gestió de recursos humans i direcció d'equips interdisciplinaris relacionats amb la informació espacial.
2. Knowledge and management in interdisplinary teams of Special Infrastructure of Data (IDE).
3. (ENG) Determinar, mesurar, avaluar i representar el terreny, objectes tridimensionals, punts i trajectòries.
4. Design and develope geomatic and topographic projects.
5. (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.
6. (ENG) Planificació, projecte, direcció, execució i gestió de processos i productes d'aplicació a la societat de l'informació dins l'àmbit geomàtic.
7. (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.
8. (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.
9. (ENG) Reunir i interpretar informació del terreny i tota aquella relacionada geogràficament i econòmicament amb ell.

Transversal:
10. 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.
11. EFFECTIVE USE OF INFORMATI0N RESOURCES - Level 3. Planning and using the information necessary for an academic assignment (a final thesis, for example) based on a critical appraisal of the information resources used.

TEACHING METHODOLOGY

Participative expositive classes
Practical classes
Attendance to technical journeys

LEARNING OBJECTIVES OF THE SUBJECT

Know the regulations that control the difusion of geographic data.
Understand the language of the technologic platform used.
Define the concept of metadata. Describe the current regulations.
Elaborate the metadata for the geographic data.
Describe the current geoservices.
Use the software of data catalogue elaboration.
Download the data services WMS, WFS, WCS.
Create a WMS service.
Define the concept of gazetter and describe his characteristics.
Know, understand and apply the infrastrucutres of spatial data.
Apply the processes and techniques of cartographic difusion in the network.
Carry out the quality control processes of cartography.

STUDY LOAD

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

Total learning time: 150 h

CONTENTS

-Introduction to the IDE

Description:
Components
Motivation
Actors
Basic principles
Interoperability
Standarization
State of art

Related activities:
Group project

Full-or-part-time: 10h
Theory classes: 4h
Laboratory classes: 1h
Self study : 5h

-Technologic Platform

Description:
Client-server arquitecture
3 layer arquitecture
N layer arquitecture
XML language

Related activities:
Activity 2

Full-or-part-time: 13h
Theory classes: 5h
Laboratory classes: 3h
Self study : 5h

-Metadata

Description:
Definition
Characterisitcs
Regulations
ISO 19115
NEM
Tools
Practices

Related activities:
Activity 3

Full-or-part-time: 10h
Theory classes: 3h
Laboratory classes: 3h
Self study : 4h

-Geoservices

Description:
Discovery
Definition of CWS
Characteristics
Tools
Practices
Publication
Definition of CWS
Characteristics
Tools
Practices
Download
Definition of CWS
Characteristics
Tools
Practices
Processing
Definnition of WPS
Characterisitcs
Others

Specific objectives:
Know the different existing services

Related activities:
Activities 4 and 5

Full-or-part-time: 21h
Theory classes: 8h
Laboratory classes: 5h
Self study : 8h

-Gazetteer

Description:
Gazetteer service

Related activities:
Activity 6

Full-or-part-time: 5h
Theory classes: 2h
Self study : 3h

ACTIVITIES

ACTIVITY 1

Description:
Carry out a practical study that includes the aspects gathered in the theoretical part: from one of the following IDE s, INSPIRE, IDEE or IDEC, where are identified all the aspects treated in the theoretical part. This study has to:

1. Identify the different concept components of the IDE inside one of the following practic implementations: INSPIRE, IDEE or IDEC.
2. Identify the combination of metadata that make the nucleus of the regulation ISO 19115 and compare it with the nucleus of the NEM and IDEC profiles.

Delivery:
Group project
Presentation

Full-or-part-time: 30h
Practical classes: 4h
Self study: 26h

ACTIVITY 2

Description:
Carry out a practical study to generate the DTD and the adequated squemes in order to cover a XML file given as a example, and also, starting from a GetCapabilities generated for a WMS service, observe which elements of the squeme (or DTD) to which they point can be erased, guaranteeing the validity of the XML.

Material:
XML file

Delivery:
Resulting file
Memory of the practice.

Full-or-part-time: 8h
Practical classes: 5h
Self study: 3h

ACTIVITY 3

Description:
Carry out a study of cataloguing three types of ressources, a cartogrpahic series, a map and a aerial image (ortophoto), inside the applications CatMEdit and MetaD. Explain the differences between the two applications (advantages and inconvenients of each one of them compared to the others).

Material:
Assignation of a sheet for Metadatar

Delivery:
File of metadata
memory of the practice

Full-or-part-time: 7h
Practical classes: 3h
Self study: 4h

ACTIVITY 4

Description:
Carry out a practical study in which using gvSIG, QuantumGIS, Gaia and ArcGIS, the students compare the options that these applications offer for the work with the protocols OGC, that the manufacters of developement groups.

Material:
Installation files
Vectorial file and raster in various formats

Delivery:
Report of the practice

Full-or-part-time: 12h
Practical classes: 4h
Self study: 8h

ACTIVITY 5

Description:
Carry out a study consisting in the installation of an application server in which will be located the map server Geoserver and will be carried a group of information layers. Afterwards, with the help of the bookstore Openlayers, the student will build a small web application that consults the published layers.

Specific objectives:
Describe the result of the consult operations
Interpretate the result of the operations

Material:
File with information in different formats
Installation file

Delivery:
Memory of the practice

Full-or-part-time: 16h
Practical classes: 6h
Self study: 10h

ACTIVITY 6

Description:
It will be carried out a connection to the server and the gazetteer across the desktop software.

Specific objectives:
Create the connection with the gazetteer.

Delivery:
Memory of the practice

Full-or-part-time: 4h
Practical classes: 2h
Self study: 2h

EVALUATION

Full-or-part-time: 14h
Theory classes: 2h
Self study: 12h

GRADING SYSTEM

Practices 40%
Individual exam 40%
Group project 20%

EXAMINATION RULES.

There is no re-evaluation exam due to the high percentage of the grade linked to the internship. Failure to submit all the practicals will result in a grade of NP.

BIBLIOGRAPHY

Basic:

- Pascual Ayats, Victor. "Infraestructuras de datos espaciales: aspectos tecnológicos". Novática: Revista de la Asociación de Técnicos de Informática. N. 198 (2009). p. 14-17.
- Guimet Pereña, Jordi. "reación de conocimiento geográfico por el usuario : el papel de las IDE's y de las plataformas de recursos de Geoinformación". Mapping [on line]. N. 234 (2009) p.34-36 [Consultation: 07/05/2020]. Available on: https://dialnet.unirioja.es/servlet/revista?codigo=912.- Bernabé Poveda, Miguel A. ; López Vázquez Carlos M. Fundamentos de las infraestructuras de datos espaciales. Madrid: UPM-Press, 2012. ISBN 978-84-939196-6-5.

RESOURCES

Hyperlink:

- http://ijsdir.jrc.ec.europa.eu/index.php/ijsdir/issue/archive- http://ies.jrc.ec.europa.eu/SDI- IJSDIR revista del Joint Research Centre of the European Commission.