Course guide
310617 - 310617 - GIS Databases

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:** Spanish

LECTURER

Coordinating lecturer: Mercedes Sanz Conde

Others: Mercedes Sanz Conde

PRIOR SKILLS

Basic tools of informatics.

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
CE3EGG. Basic knowledge about the use and programation of computers, operative systems, dtabase and software programmes with appplication in engineering.

Generical:
CG5EGG. Determine, measure, evaluate and represent the ground, tridimensional objects, points and trajectories.
CG1EGG. Design and develope geomatic and topographic projects.
CG8EGG. Planification, project, direction, execution and management of measurements processes, information systems, image exploitaiton, positioning and navegation; modeling, representation and visualization of the territorial information in, under and above the ground surface.
CG11EGG. Plannification, project, direction, execution and mangement of processes and products of application in the information society inside the geomatic field
CG12EGG. Plannification, project, direction, execution and mangement of processes and products of application in the register, ordination of territory and valoration 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.

07 AAT. SELF-DIRECTED LEARNING. Detecting gaps in one's knowledge and overcoming them through critical self-appraisal. Choosing the best path for broadening one's knowledge.

TEACHING METHODOLOGY

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

LEARNING OBJECTIVES OF THE SUBJECT

Learn about the structures of BB. DD and the use of appropriate tools for your treatment.

STUDY LOAD

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

Total learning time: 150 h

CONTENTS

Introduction to Database.

Description:
Architecture of a Database. External , conceptual and internal levels.
System of Management of a Database (DBMS). Functions of a DBMS.
Data models: Entity-Relation Model, Relational Model. Object oriented model.

Specific objectives:
Describe the elements that make up the database.
Describe the types of databases.

Related activities:
Activity 1.

Full-or-part-time: 18h
Theory classes: 3h
Practical classes: 3h
Laboratory classes: 2h
Self study : 10h

Structured Query Language

Description:
Introduction to SQL.

Specific objectives:
To create a base with SQL and a SGBD. To design and to manage the base.

Related activities:
Activity 2.

Full-or-part-time: 46h
Theory classes: 6h
Practical classes: 6h
Laboratory classes: 4h
Self study : 30h

Relationship Model

Description:
Introduction.
Entity/ Relationship model.
Relational model.
Tranformation E/R to Relational

Specific objectives:
To describe the keys concepts of data models.
Operations with Relational BB.DD.

Related activities:
Activity 3.

Full-or-part-time: 30h
Theory classes: 6h
Practical classes: 4h
Self study : 20h

Design of Database for SIG

Description:
Database Design in logic level.

Specific objectives:
To describe the elements of the design of a database.

Related activities:
Activity 4

Full-or-part-time: 36h
Theory classes: 6h
Practical classes: 6h
Laboratory classes: 4h
Self study : 20h

Internet Database

Description:
Mapping Database.
SIG and Database.
New trends in Database.

Specific objectives:
Queries to remote database.

Related activities:
Activity 4

Full-or-part-time: 14h
Theory classes: 1h 30m
Practical classes: 1h 30m
Laboratory classes: 1h
Self study : 10h

ACTIVITIES

Activity 1

Description:
MySQL interface

Specific objectives:
Elements of databases.
Schema of databases

Material:
Software MySQL

Delivery:
Report 1.

Full-or-part-time: 2h
Laboratory classes: 2h

Activity 2

Description:
Introduction to SQL.

Specific objectives:
Learning basics commands of SQL.

Material:
Software MySQL

Delivery:
Report 2.

Full-or-part-time: 6h
Laboratory classes: 6h

Activity 3

Description:
E-R Model.
Relational Model.

Specific objectives:
E-R "Entity relationship"
Transformation to Relational model.

Material:
Software MySQL Workbench.

Delivery:
Report 3

Full-or-part-time: 6h
Laboratory classes: 6h

Activity 4

Description:
Design of a overall Database.

Specific objectives:
Design Database.

Material:
Software MySQL.

Delivery:
Report 4.

Full-or-part-time: 6h
Laboratory classes: 6h

GRADING SYSTEM

Week 3: Test10%. Theme 1.
Week 7/8: Practial exam. 30% Theme 2.
Week 12: Theoric and practical exam. 20% Theme 3.
Week 15: Practical exam. 30%. Theme 4. Final exam.
The rest, 10%, attendance, delivery practise, ...
Week 19: Reevaluation.

EXAMINATION RULES.

All tests are mandatory.

BIBLIOGRAPHY

Basic:
- Miguel Castaño, A.; Piattini Velthuis, M. Fundamentos y modelos de bases de datos. 2ª ed. Madrid: RA-MA, 1999. ISBN 8478973613.
- Abelló, A.; Rollón, E.; Rodríguez, E. Database design and administration [on line]. 2ª ed. Barcelona: Edicions UPC, 2010 [Consultation: 05/07/2022]. Available on: http://hdl.handle.net/2099.3/36504. ISBN 9788498804317.
- Silberschatz, A.; Sundarshan, S.. Fundamentos de diseño de bases de datos [on line]. 5ª ed. Madrid: McGraw-Hill, 2007 [Consultation: 20/09/2022]. Available on: http://www.ingebook.com/ib/NPcd/IB_BooksVis?cod_primaria=1000187&codigo_libro=5935. ISBN 9788448156718.
- Olaya, Víctor. Sistemas de Información Geográfica [on line]. [S. l.]: OsGeo, 2012 [Consultation: 20/09/2022]. Available on: http://volaya.github.io/libro-sig/.

Complementary:
- Date, C. J. SQL and relational theory: how to write accurate SQL code. 2nd ed. Sebastopol, California: O'Reilly, 2012. ISBN 9781449316402.

RESOURCES

Computer material:
- MySQL. Resource
- Workbench. Resource

Other resources:
Software free Workbench