

Course guide 2500212 - GEASIINFGE - Geographic Information Systems

Last modified: 18/06/2024

Unit in charge: Teaching unit:	Barcelona School of Civil Engineering 751 - DECA - Department of Civil and Environmental Engineering.
Degree:	BACHELOR'S DEGREE IN ENVIRONMENTAL ENGINEERING (Syllabus 2020). (Compulsory subject). BACHELOR'S DEGREE IN ENVIRONMENTAL ENGINEERING / BACHELOR'S DEGREE IN MINERAL RESOURCE ENGINEERING AND MINERAL RECYCLING (Syllabus 2024). (Compulsory subject).
Academic year: 2024	ECTS Credits: 6.0 Languages: Catalan, Spanish

LECTURER

Coordinating lecturer:

Others:

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

14445. Recognize the biological bases and foundations of the plant and animal field in engineering: notions of genetics, biochemistry and metabolism, physiology, organisms and environment, population dynamics, flows of matter and energy and changes in ecosystems, biodiversity, principles of the kinetics of microbial growth and reactor theory.

14447. Obtain basic knowledge about the use and programming of computers, operating systems, databases and basic numerical calculation and applied to engineering.

14451. Apply the fundamental concepts of statistics and randomness of physical, social and economic phenomena, as well as uncertainty and decision-making techniques.

14452. Enhance the capacity of spatial vision and identify the techniques of graphic representation, topography, photogrammetry, cartography, remote sensing and Geographic Information systems.

14453. Describe and apply the techniques of analysis of physical, chemical and biological parameters; Integrate the experimental evidence found in field and / or laboratory data with the theoretical knowledge and interpret its results.

14454. Formulate the principles of fluid mechanics and the fundamentals of continuous medium mechanics.

14455. Identify the concepts and technical aspects linked to the conduit systems, both in pressure and in free sheet and apply them to the water supply transport networks; pumping systems; unit networks; separative networks; Avenues prevention systems in urban areas and analysis of tools for the recovery of altered river and coastal spaces.

14456. Describe the processes linked to the water cycle: atmospheric circulation and rain formation; rain transformation into runoff; and apply them to surface and underground hydrology associated with avenues risk, surface water pollution, aquifer management and groundwater pollution.

Generical:

14440. Identify, formulate and solve problems related to environmental engineering.

14441. Apply the functions of consulting, analysis, design, calculation, project, construction, maintenance, conservation and exploitation of any action in the territory in the field of environmental engineering.

14442. To use in any action in the territory proven methods and accredited technologies, in order to achieve the greatest efficiency respect for the environment and the protection of the safety and health of workers and users.

TEACHING METHODOLOGY

LEARNING OBJECTIVES OF THE SUBJECT



STUDY LOAD

Туре	Hours	Percentage
Self study	90,0	60.00
Hours small group	15,0	10.00
Hours medium group	15,0	10.00
Hours large group	30,0	20.00

Total learning time: 150 h

CONTENTS

0. Introduction to SIG

Description: general concepts, applications ... LAB1. SIG.CRS

Full-or-part-time: 9h 36m Theory classes: 2h Laboratory classes: 2h Self study : 5h 36m

I. Coordinate Reference Systems (CRS)

Description:

Spatial Reference Systems Cartographic projections LAB_SIG2. Spatial Reference System

Full-or-part-time: 14h 23m Theory classes: 4h Laboratory classes: 2h Self study : 8h 23m

II. Geoinformation Capture Techniques

Description:

GNSS FIELD1. GNSS. RTK FIELD2.GNSS. DGPS (GPS for GIS) LAB1. GNSS data processing LIDAR (ALS and TLS) FIELD3. Acquisition of Terrestrial LIDAR data LAB2. LIDAR data processing Photogrammetry applied to massive data capture LAB8. Photogrammetric processing Exercises

Full-or-part-time: 62h 24m Theory classes: 8h Practical classes: 2h Laboratory classes: 16h Self study : 36h 24m



III. Geographic Information Systems

Description:

Geoinformation and databases management LAB4. Geoinformation. Formats and edition LAB_SIG2. Databases Geoprocessing Exercises LAB_SIG3&4.Geoprocessing GIS project

Full-or-part-time: 57h 35m Theory classes: 8h Practical classes: 2h Laboratory classes: 14h Self study : 33h 35m

GRADING SYSTEM

BIBLIOGRAPHY

Basic:

- Bosque Sendra, J. Sistemas de información geográfica. 2a ed. corr. Madrid: Rialp, 1997. ISBN 8432131547.

- Nuñez-García, A.; Valbuena; J.L.; Velasco, J. G.P.S.: la nueva era de la topografía. Madrid: Ediciones de las ciencias sociales, 1992. ISBN 8487510310.

- Heritage, G.L; Large, A.R.G. Laser scanning for the environmental sciences. Chichester, UK ; Hoboken, NJ: Wiley-Blackwell, 2009. ISBN 9781405157179.