Course guide
310638 - 310638 - Remote Sensing Project

Last modified: 09/05/2025

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). (Optional subject).

Academic year: 2025 **ECTS Credits:** 4.5 **Languages:** Catalan, Spanish

LECTURER

Coordinating lecturer: CAROLINA PUIG POLO

Others:

REQUIREMENTS

Have studied or passed the subject of Remote Sensing

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
1. Knowledge, application and analysis of the processes of treatment of digital images and special information, proceding from airborne and satelite sensors.
2. Design and develope geomatic and topographic projects.
3. (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.
4. (ENG) Planificació, projecte, direcció, execució i gestió de processos i productes d'aplicació a la societat de l'informació dins l'àmbit geomàtic.

Generical:
8. Use of teams and instrumental: Capacity to select the necessary ressources to the achievement of the planned goals according to the quality requirements. Use of the teams, in adequated conditions, with professional efficiency and taking into account the limitations of the instruments and its context of use, in relation with the required precissions.

Transversal:
5. 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.
6. SUSTAINABILITY AND SOCIAL COMMITMENT - Level 3. Taking social, economic and environmental factors into account in the application of solutions. Undertaking projects that tie in with human development and sustainability.
7. EFFECTIVE USE OF INFORMATI0N RESOURCES - Level 1. Identifying information needs. Using collections, premises and services that are available for designing and executing simple searches that are suited to the topic.

TEACHING METHODOLOGY

The subject is mainly practical, at the beginning of each content will be done a brief theoretical explanation and afterwards will be applied the learnt concepts.
The attendance is considered indispensable for the correct assimilation of the subject, because the project is made in a colaborative way.

LEARNING OBJECTIVES OF THE SUBJECT

The main objective of this course is to consolidate the knowledge acquired in the Remote Sensing course and to delve into real applications through practical cases. The course will be based on programming in Python and accessing images in the cloud.

STUDY LOAD

Type	Hours	Percentage
Hours large group	18,0	16.00
Self study	67,5	60.00
Hours medium group	27,0	24.00

Total learning time: 112.5 h

CONTENTS

- Introduction to sensons and the tipology of satellite images used during the course. Introduction to the software used.

Description:
Brief introduction to the sensors and images used during the course. Introduction to software: LeoWorks, Neast, Miramon,..

Specific objectives:
Know the characterisitcs of the sensors and images.
Learn the basic functioning of software about satellite image treatment.

Related activities:
Activity 1. Visualization and interpretation of optic images and radar images

Full-or-part-time: 6h
Theory classes: 2h
Practical classes: 2h
Self study : 2h

- Preprocessing of satellite images: geometric corrections and radiometric

Description:
Reviewed of the geometric correction and radimetric of optic images and radar images

Full-or-part-time: 17h
Theory classes: 4h
Practical classes: 5h
Self study : 8h

- Meteorological satellites. Applications.

Description:
Brief introduction to the different types of meteorological satellites and the spectral band of their sensors. Characterisitcs from the METEOSAT and NOAA images. Estimation of the precipitation across remote sensing images.

Full-or-part-time: 25h 30m
Theory classes: 4h
Practical classes: 4h
Self study : 17h 30m

- Applications of the remote sensng for vegetation, ground and ice studies.

Description:
Description o the analysis tools that allow us to classify different grounds, delimit surfaces with gels and determinate zones with vegetal cover.

Full-or-part-time: 31h
Theory classes: 4h
Practical classes: 7h
Self study : 20h

- Multitemporal analysis of images. Detection of changes. Use changes and covers of ground.

Description:
Study of how with multitemporal images, optics and by radar, allow us to analize the evolution of terrestrial covers.

Full-or-part-time: 33h
Theory classes: 4h
Practical classes: 9h
Self study : 20h

GRADING SYSTEM

The qualification of the subject is break down in:
30% delivery of activities
70% delivery and presentation of the syntesis project

EXAMINATION RULES.

To pass the subject, the student must have delivered all the activities programmed and attended to the practical classes.

BIBLIOGRAPHY

Basic:
- International journal of remote sensing [on line]. London: Taylor & Francis, 1980- [Consultation: 24/01/2023]. Available on: http://www.tandfonline.com/loi/tres20.- Remote sensing of environment [on line]. New York: Elsevier Science Pub. Co., [Consultation: 24/01/2023]. Available on: http://www.sciencedirect.com/science/journal/00344257.- ISPRS Journal of Photogrammetry and Remote Sensing [on line]. Amsterdam: International Society of Photogrammetry and Remote Sensing, [Consultation: 24/01/2023]. Available on: https://www.sciencedirect.com/science/journal/09242716.- Woodhouse, Iain H. Introduction to microwave remote sensing [on line]. Boca Raton: Taylor & Francis, 2006 [Consultation: 24/01/2023]. Available on: https://discovery.upc.edu/permalink/34CSUC_UPC/5rq1ap/alma991005083779906711. ISBN 0415271231.