

## **Syllabus Information**

**Academic year:** 2024/25

**Subject:** 25265 -

**Faculty / School:** 201 - Escuela Politécnica Superior

**Degree:** 571 - Degree in Environmental Sciences

**ECTS:** 6.0

**Year:**

**Semester:** First Four-month period

**Subject type:** Optional

**Module:**

### **1. General information**

This subject focuses on the processing, modelling and application of satellite images, digital elevation models, aerial images, LiDAR data and other remote data using geographic information systems (QGIS and ARCGIS). The students will learn to manage remote satellite datasets in Snap software.

This knowledge provides the student with the concepts and methodologies necessary for the resolution of a wide variety of environmental and territorial problems, such as geological risks, territorial planning and forest and agricultural management

### **2. Learning results**

To pass this subject, students must demonstrate the following results:

- RA1: Define and explain the theoretical foundations of remote sensing.
- RA2: Differentiate and manage the basic procedures to improve and correct, visualize and classify images.
- RA3: Acquire the basic knowledge to carry out landform, vegetation and land use mapping using aerial photography, orthoimages and satellite images.
- RA4: Acquire the necessary knowledge to process LiDAR data and to be able to make Digital Land Elevation

Models.

RA1 and RA2 are aligned with SDG 1 and 15, and RA3 and RA4 are aligned with SDG 13 and 15

### **3. Syllabus**

The subject combines theory and computer practices on the following topics:

1. -Introduction to remote sensing: context, evolution and basic concepts.
2. -Physical principles of remote sensing: basics of remote sensing, terms and units of measurement, notions of electromagnetic radiation, the solar domain of the spectrum (characteristics and conditioning factors), typical spectral signatures.
3. -Remote sensing systems and software: types of sensors, orbital characteristics of satellites, resolution of a sensor system, search and download of images.
4. -Remote sensing data processing, interpretation and analysis: visual interpretation of aerial and satellite images, digital image processing and analysis, environmental applications of remote sensing.
5. -The use of aerial photography: photointerpretation of arid, humid and cold areas, serial sequences of aerial photos as markers of landscape evolution and human activities.
6. -LiDAR data processing and analysis techniques.

### **4. Academic activities**

The activities are divided into face-to-face (40% of the total of the subject) and non-face-to-face (60%).

#### **PRESENTATIONS**

- Theoretical and practical computer sessions - Both are intertwined in the development of the same class. They consist of participatory lectures and the application of visual and digital processing techniques of environmental remote sensing data with computer programs.
- Assessment tests.

## NON-FACE-TO-FACE

- Autonomous personal study of the student for the assimilation of the concepts and contents of the syllabus of the subject.
- Elaboration of a portfolio of practices.
- Practical work.

Theoretical and practical sessions will be related to SDGs 13 and 15.

### **5. Assessment system**

The final grade of the subject will be obtained from the sum of the partial grades of each of the evaluation activities by applying the following formula:

40% theory + 40% practical portfolio + 20% work

The theory exam will include objective short-answer and open-ended questions of medium length.

The work will address issues related to SDG 13 and SDG 15. The practices and assignments will be submitted electronically via Moodle prior to the written test.

To pass the subject, the sum of all parts must be equal to or higher than 5. Students who have not taken or have not passed the global evaluation in the first call have the option of taking any or all of the parts in the second official call.

The average success rate of the subject in the last three years is 100%.

### **6. Sustainable Development Goals**

4 - Quality Education  
13 - Climate Action  
15 - Life on Land