

60424 - Fundamentals of Remote Sensing

Syllabus Information

Academic year: 2024/25

Subject: 60424 - Fundamentals of Remote Sensing

Faculty / School: 103 - Facultad de Filosofía y Letras

Degree: 352 - Master's in Geographic Information Science and Technology for Land Management: Geographic Information Systems and Remote Sensing

ECTS: 2.0

Year: 1

Semester: Annual

Subject type: Optional

Module:

1. General information

This subject, designed as a complement for students with previous training deficiencies in remote sensing, aims at the acquisition or strengthening of basic skills in the subject. Pre-enrolment counselling will determine the need for enrolment. It provides competencies that contribute to the achievement of the following SDGs (Agenda 2030):

SDG 2 Zero Hunger (Objectives 2.3 and 2.4).

SDG 6 Clean water and sanitation (Objective 6.6).

SDG 7 Affordable and non-polluting energy (Objective 7.2).

SDG 11 Sustainable cities and communities (Objectives 14.1, 14.3 and 14.4).

SDG 13 Climate action (Objectives 13.1 and 13.3).

SDG 15 Life of terrestrial ecosystems (Objectives 15.1 to 15.3).

2. Learning results

- * Identify and list the basic resources for learning remote sensing (manuals, tutorials and websites...) and use accurately and at an advanced level the vocabulary, terminology and nomenclature of the discipline.
- * Explain in an argued way the conceptual aspects of remote sensing as a tool for geographic analysis in relation to its nature, technical-instrumental evolution, scale-resolution, components and working methods.
- * Describe the physical fundamentals of remote sensing and the processes of interaction of electromagnetic energy with the atmosphere, assessing their consequences in remote sensing images.
- * Explain, compare and interpret, based on the results obtained, the most common colour compositions and the various procedures to improve the visualization of satellite images (monoband and false colour).
- * Describe the factors responsible for the spectral behaviour of the fundamental land covers, identifying them in the satellite image from the interpretation of their typical signatures.

3. Syllabus

1. Teaching organization (objectives, syllabus, evaluation).
2. General remote sensing bibliography and Internet resources.
3. Conceptual framework of remote sensing in the context of GIT.
4. Physical principles of remote sensing: Electromagnetic spectrum. Atmospheric interactions.
5. Remote sensing systems, digital imaging and resolution concepts.
6. Visualization -monoband and colour composites- and enhancement of satellite images.
7. Typical spectral signatures (introduction).
- 8- Remote sensing applications (introduction).

4. Academic activities

A theoretical and theoretical-practical subject, without the use of specific computer resources, in which the student's autonomous work, their collaborative attitude in the practical sessions and the use of tutorials are of great relevance.

- Theoretical-practical sessions: a) lecture; b) analysis of satellite images.
- Collaborative work: a) commentary and reflection on methodological approaches to remote sensing analysis; b) diagnosis and interpretation of satellite images.
- Personal study of the student for the assimilation of the syllabus, the use of bibliography and Internet resources and the exercise in the diagnosis of satellite images.

- Written evaluation test.

5. Assessment system

First call:

Students may opt for CONTINUOUS EVALUATION or GLOBAL EVALUATION. In both cases, the evaluation is based on the same type of tests and criteria, although the global evaluation is carried out during the official evaluation period established in the University's academic calendar, while the continuous evaluation is carried out during the class period.

The evaluation consists of an individual exercise -a written test- which accounts for 100% of the grade and includes:

- Short-answer objective questions on terminology, bibliography and basic concepts (25%). Evaluation criteria: mastery of the concepts handled, concreteness and precision.
- Open-ended questions of medium length related to conceptual and technical-methodological aspects (30%). Evaluation criteria: mastery of content, originality of approach, ability to relate, structure, relevance of arguments, correct use of terminology.
- Open and short answer questions referring to the identification of satellite images (bands, colour compositions...) (45%). Evaluation criteria: diagnostic capacity, coherence in the argumentation, justified incorporation of concepts and theoretical contents, correct use of terminology, concreteness and clarity.

Second call:

Global evaluation with the same tests and evaluation criteria of the first call.

6. Sustainable Development Goals

- 2 - Zero Hunger
- 6 - Clean Water and Sanitation
- 7 - Affordable and Clean Energy