

28319 - Remote Sensing

Información del Plan Docente

Academic Year	2016/17
Academic center	103 - Facultad de Filosofía y Letras
Degree	419 - Degree in Geography and Land Management
ECTS	6.0
Course	3
Period	First semester
Subject Type	Compulsory
Module	---

1.Basic info

1.1.Recommendations to take this course

1.2.Activities and key dates for the course

2.Initiation

2.1.Learning outcomes that define the subject

2.2.Introduction

3.Context and competences

3.1.Goals

3.2.Context and meaning of the subject in the degree

3.3.Competences

3.4.Importance of learning outcomes

4.Evaluation

5.Activities and resources

5.1.General methodological presentation

The teaching methodology and the sequence of the contents logically reflects the process of successive approximation, in terms of increasing complexity, to the critical use of satellite imagery in analysing and modeling of territorial processes. This approach, moreover already consolidated in university teaching in remote sensing, deliberately avoids teaching exclusively based on dedicated software, which, although it still valid in other contexts, is not suitable for achieving the desired objectives. This does not prevent, but favors, that students acquire the technical-instrumental skills required for an operational implementation of the competencies to be acquired in this matter, but on a theoretically and methodologically well founded basis.

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5.2.Learning activities

The learning process involves the necessary overlap between classroom activities more theoretical and more practical. Accordingly, while maintaining due proportion both types of activities (16 and 36 hours, respectively, of lecture and practical) is not only impossible, but inadequate, differentiate into specific sessions, since both are intertwined in the development of one session. Only the first sessions of the course are devoted exclusively to theoretical and epistemological aspects of the discipline.

- Theoretical-practical sessions (52 hours) including:

-- Lecture sessions (16 horas).

-- Practical application of techniques of visual analysis and digital processing of satellite images (36 hours), which involves learning skills in the use of specific remote sensing software.

- Seminars - group activities (3 hours):

-- The first seminar aims to guide the directed activity work that students should develop, in groups of four, around fields of application of space remote sensing (1 hour).

-- The second seminar consists of the exposition and discussion of the results of directed activity work done (2 hours).

- Direct activity (15 hours), that can take two different modalities:

-- In the case of continuous assessment, this work on remote sensing applications is developed by students in groups of four, with direct teacher mentoring. This activity, initially oriented at the first seminar concludes with the exposition and discussion at the second seminar.

-- In the case of global assessment, this work is carried out individually, but also mentored by the teacher, implying a greater bibliographic effort.

- Field work (1 hour), divided into small groups (maximum 8 students), for performing an practical exercise on field spectroradiometry.

- Private study (75 hours).

- Assessment - two written exams (2 hours each).

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5.3. Program

The lecture course will address the following main issues:

1. Introduction: Basic concepts and evolution of remote sensing. Epistemological and technological context.
2. Nature of remote sensing data: Electromagnetic spectrum. Physical principles of remote sensing and atmospheric interactions. Typical spectral signatures.
3. Satellite remote sensing missions and programs. Resolution of a sensor system.
4. Visual interpretation: Image enhancements. RGB and HSI colour composites.
5. Pretreatments -geometric and atmospheric corrections- and filtering -spatial enhancements-.
6. Fundamentals of digital images processing: Generation of derived variables (spectral indices, PCA). Digital image classification.
7. Remote sensing and GIS integration: Remote Sensing Applications.

5.4. Planning and scheduling

- First 6 weeks: theoretical-practical sessions, items 1 to 4 of the program.
- 6th week: fieldwork session on spectroradiometry.
- After the 6th week: first written assessment exam.
- 7th to 15th weeks: theoretical-practical sessions, items 5 to 7 of the program.
- 9th week: first seminar.
- 14th week: second seminar.
- Last week: second written assessment exam.

For further details concerning the timetable, classroom and other information of the course please refer to the "Facultad de Filosofía y Letras" web site (<https://fyl.unizar.es/horario-de-clases#overlay-context=horario-de-clases>)

5.5. Bibliography and recommended resources

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- BC** Pinilla Ruiz, Carlos. Elementos de teledetección / Carlos Pinilla Ruiz. Madrid: RA-MA, D.L. 1995.
- BC** Remote sensing. Course book. [1] / Courseteam J.J.M. Leinders... [et al.]. Heerlen: Open Universiteit, 1989
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