COURSE DATA

DATA SUBJECT

Code: 33806
Name: Aerial and Space Remote Sensing
Cycle: Undergraduate Studies
ECTS Credits: 6
Academic year: 2025-26

STUDY (S)

Degree	Center	Acad. year	Period
1318 - Degree in Geography and the Environment	Facultat de Geografia i Història	4	First quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
1318 - Degree in Geography and the Environment	Air and space remote sensing	ELECTIVES

COORDINATION

LOPEZ GARCIA MARIA JOSE

SUMMARY

The degree of Geography and Environment, the subject optional air and space remote sensing complete the student's knowledge on Geographic Information Techniques (TIG). Remote sensing techniques involve the collection and extraction of useful geographical information from the data recorded by sensors on mobile platforms (aircraft, satellites). In the course the physical principles of remote sensing study, methods of analysis and image processing, the main sensors and satellites and applications of this technique. Exercises and activities that integrate satellite imagery, aerial photography and digital mapping software using digital image processing and GIS will arise.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

There are no specified enrollment restrictions with other subjects of the curriculum.

OTHER REQUIREMENTS

It is advisable to have passed the required courses on the techniques of geographic information: Cartography I and II, GIS I and II and GIS Statistics

COMPETENCES / LEARNING OUTCOMES

-

Be able to produce statistical information. Know how to use statistical software.

Be able to relate and synthesise cross-disciplinary territorial information.

Be able to use cartography and geographic information systems.

Be able to work independently.

Be able to work in interdisciplinary teams.

Get acquainted with geographic information systems as a tool for learning about and interpreting the territory and the environment.

Have computer skills related to the field of study.

Have oral and written communication skills in one's own language and in a foreign language.

Have research skills.

Learn about geographic information systems.

Show motivation for quality, responsibility and intellectual honesty.

DESCRIPTION OF CONTENTS

1. INTRODUCTION

Concept of remote sensing. Historical development. Methods and techniques

2. Physical Fundamentals

Electromagnetic radiation. Radiation laws. Spectrum of solar and terrestrial radiation. Interaction of solar radiation with the earth's surface: spectral response. Propagation of the radiation through the atmosphere. Transforming the data into physical values (reflectivity, temperature).

3. TYPES OF SENSORS

Cameras, radiometers and radars. Aerial photographs and satellite images. Concept of scale and resolution.

4. SATELLITES EARTH OBSERVATION

Geostationary and geosynchronous satellites. Main series of operational satellites, meteorological satellites and satellite resources.

5. DIGITAL IMAGE PROCESSING

Enhancement and visualization techniques (color composition, filtered). Geometric correction techniques. Spectral indices (indices of vegetation). Digital classification techniques.

6. APPLICATIONS

Applications of remote sensing for the analysis of the territory and the development of thematic mapping. Examples and case studies.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Theory	30,00
Other activities	15,00
Computer classroom practice	15,00
Total hours	**60,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	40,00
Independent study and work	20,00
Preparation of lessons	30,00
Preparation for assessment activities	0,00
Resolution of case studies	0,00
Total hours	**90,00**

TEACHING METHODOLOGY

1) Classes:

The teacher explains the basic contents of the subject, structured in the above-mentioned topics, artwork and supported the proposal of practical exercises and activities to be developed by students individually or in groups.

2) Student work (individual):
The student develops an individual work about 6 applications following the guidelines given by the teacher.

3) Working student (group):
The student group made several practical exercises. The professor will present a guide to practice and each group will deliver a report with the results valid for evaluation.
Performing will practice during class hours and tutored (follow) contained in the annex to this guide.

EVALUATION

Evaluation is an ongoing evaluation of student work, both individually and in groups, so that the continued attendance at classes and complementary activities is essential.
The proportion of the final grade is as follows:
60% theoretical and practical examination
40% of student work (individual work and practices of group lessons)
Important:
To pass the course you must reach a minimum of 4 out of 10 in each of the parties comprising the evaluation because, otherwise, not the parties themselves will be compensated.

In the 2nd Call, the theoretical-practices evaluation criteria will be the same as in the 1st Call.

REFERENCES

- CAMPBELL, J.B., Introduction to Remote Sensing, Guilford Press 2007
- CHUVIECO, E., Teledetección ambiental : la observación de la Tierra desde el espacio , Ed. Ariel, 2002, 586p
- CHUVIECO, E., Fundamentos de teledetección espacial. Madrid: Ediciones Rialp, S.A., 3ª ed.1996, 453 p.
- LILLESAND, T.M., KIEFER, R.W. y CHIPMAN, J..W. Remote sensing and image interpretation, John Wiley & Sons, 2004.
- LO, C.P., Applied remote sensing. Longman Sientific & Technical, 1986, 393 p.
- SOBRINO, J.A. (Editor), Teledetección, Universitat de Valencia, 2000, 467 pp.
- Asociación Española de Teledetección : http://telenet.uva.es

- Asociación Geógrafos Españoles (AGE) : Grupo de Métodos Cuantitativos, SIG y Teledetección: http://www.age.es

- Revista: International Journal of Remote Sensing, Taylor and Francis Ltd., Reino Unido.

- Revista: Remote Sensing of Environment, Elsevier Science Publishing Company USA.

- Revista de Teledetección, Asociación Española de Teledetección, Madrid..