

30137 - Digital and Remote Sensing Geographical Information

Syllabus Information

Academic year: 2024/25

Subject: 30137 - Digital and Remote Sensing Geographical Information

Faculty / School: 179 - Centro Universitario de la Defensa - Zaragoza

Degree: 563 - Bachelor's Degree in Industrial Organisational Engineering

ECTS: 6.0

Year: 4

Semester: Second semester

Subject type: Compulsory

Module:

1. General information

The main objective of the subject is for students to acquire knowledge and skills for the application of Geographic Information Systems (GIS), Global Navigation Satellite Systems (GNSS) and Remote Sensing to the organization of industrial and military installations.

In order to take this subject, it is recommended to have some basic computer and statistical knowledge.

2. Learning results

1. Master the resolution of geographic information problems that may arise in engineering.
2. Have the aptitude to apply the acquired knowledge of Geographic Information Systems, navigation systems and remote sensing systems.
3. Know how to use methods and products related to the Earth sciences to solve the problems that may arise

3. Syllabus

Unit 1: Geographic Information Systems.

1.1. Introduction.

1.2. The nature of geographic information: data models.

1.3. Information sources: capture, creation and maintenance of spatial databases.

1.4- Main spatial analysis functions.

1.5. Data visualization and presentation.

Unit 2: Global Navigation Satellite Systems.

2.1. What are they?

2.2- Operation.

2.3- Types of receivers.

2.4- Sources of errors and technologies to mitigate them.

2.5- Key parameters in the management of receivers.

Unit 3: Remote sensing.

3.1. Introduction.

3.2- Nature of Remote Sensing data.

3.3. The concepts of resolution and program.

3.4- Visualization and analysis of satellite images.

4. Academic activities

- Theoretical and practical classroom sessions:

1. Master class of expository modality for the presentation of basic concepts.
2. Resolution of practical cases involving the application of GIS, GNSS and Remote Sensing.
3. Inverted classroom to learn the cartographic design process.
4. Peer evaluation workshops to foster cooperative-collaborative learning.
5. Feedback, use of rubrics and self-assessment to enhance formative evaluation.
6. Personalized tutoring to resolve doubts.

- Autonomous personal study of the students: for the acquisition of theoretical concepts and skills for the handling of GIS, GNSS and Remote Sensing.

5. Assessment system

CONTINUOUS EVALUATION FIRST CALL:

Students will be able to pass the subject through the continuous evaluation procedure. To do so, they must pass the evaluation instruments listed below:

1. Practical work portfolio: autonomous and non-face-to-face preparation of practical work (30% of the grade, minimum 4 out of 10).
2. Theoretical-practical knowledge exam: the exam will consist of two midterms (70% of the grade, minimum 4 out of 10). The first midterm test will account for 35% of the final evaluation grade and the second test, 35%.

In order to pass the subject, students must obtain a final grade of 5 or higher.

Evaluation criteria: correctness of the contents, adequacy and correctness of the techniques and methods used, correct design of graphic representations, adequate and careful presentation.

GLOBAL TEST FIRST AND SECOND CALL:

Students who do not pass the subject by continuous evaluation or who would like to improve their grade, will have the right to take the overall test set in the academic calendar, prevailing, in the case of the first call, the best of the grades obtained. This global test will consist of the same evaluation instruments as the continuous evaluation, with the same weighting, minimum grade and evaluation criteria.

Assessment instruments:	Weighting	LR-1	RA-2	RA-3
Practice portfolio	30%	X	X	X
Theoretical and practical knowledge	70%	X	X	X

6. Sustainable Development Goals

- 9 - Industry, Innovation and Infrastructure
- 13 - Climate Action
- 16 - Peace, Justice and Strong Institutions