

Course guide

33103 - SIGTARN - Geographic Information Systems and Teledetection Applied to the Use of Natural Resources

Last modified: 04/05/2023

Unit in charge: Manresa School of Engineering
Teaching unit: 750 - EMIT - Department of Mining, Industrial and ICT Engineering.
Degree: MASTER'S DEGREE IN NATURAL RESOURCE ENGINEERING (Syllabus 2015). (Compulsory subject).
Academic year: 2023 **ECTS Credits:** 5.0 **Languages:** Spanish

LECTURER

Coordinating lecturer: Vallbe Mumburu, Marc

Others:

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

1. A capacity for in-depth understanding of remote sensing and satellite imagery interpretation techniques applied to the characterisation and management of geological resources.

Generical:

2. The ability to summarise and think critically. The ability to adapt to new technologies.
3. The ability to take the initiative and be creative.

TEACHING METHODOLOGY

Attendance at scheduled lectures is noted. Students are assessed on the practical exercises and the presentation of a practical research project in which the course content is applied to a topic of interest chosen by the student

LEARNING OBJECTIVES OF THE SUBJECT

1. To understand the physical concepts that justify using images taken from artificial satellites to extract information on our planet.
2. To present digital image processing tools and become familiar with, and apply, the most typical remote sensing operations.
3. To bring attention to our geographic and natural environment through the practical use of satellite imagery and computer tools.

STUDY LOAD

Type	Hours	Percentage
Hours medium group	15,0	33.33
Hours large group	30,0	66.67

Total learning time: 45 h



CONTENTS

GEOGRAPHIC INFORMATION SYSTEMS

Description:

1. Introduction
2. Nature of geographic data. Georeferencing
3. GIS Data models and structure: raster, vector layers

Full-or-part-time: 18h

Theory classes: 11h

Practical classes: 7h

REMOTE SENSING

Description:

1. Theoretical fundamentals of data collection
 - 1.1 Physical fundamentals
 - 1.2 Space remote sensing systems
2. Digital processing of satellite imagery
 - 2.1 Digital data matrix
 - 2.2 Image and georeference correction
 - 2.3 Digital classification

Full-or-part-time: 18h

Theory classes: 11h

Practical classes: 7h

TOPIC 3: CASE STUDIES

Description:

1. Practical examples with available data
2. Planning of a research assignment on the topic

Full-or-part-time: 9h

Theory classes: 5h

Practical classes: 4h

GRADING SYSTEM

Students' knowledge of the theory is assessed in two written exercises, one related to geographical information systems and another to remote sensing. Each of these activities corresponds to 10% of the final mark.

80% of the final mark is based on practical assignments on the application of the theory for which students must follow specific instructions that are given during the course.

BIBLIOGRAPHY

Basic:

- Chuvieco, E. Fundamentos de teledetección espacial. 3ª ed. rev. Madrid: Rialp, 1996. ISBN 843213127X.
- Sabins, Floyd F. Remote sensing: principles and interpretation. 3rd ed. New York: W.H. Freeman, 1997. ISBN 0716724421.
- Sobrino, José A., ed. Teledetección. València: Universitat de València, 2000. ISBN 8437042208.
- Vincent, Robert K. Fundamentals of geological and environmental remote sensing. Upper Saddle River: Prentice Hall, 1997. ISBN 0133487806.