

<b>POLI</b> ESCOLA SUPERIOR TECNOLOGIA GESTÃO <b>TÉCNICO</b> <b>GUARDA</b>	<b>SUBJECT DESCRIPTION</b>	<b>MODELO</b> PED.013.03
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Course	Topographic Engineering					
Subject	Remote Sensing					
Academic year	2023/2024	Curricular year	2nd	Study period	2nd semester	
Type of subject	Compulsory	Student workload (H)	Total: 140	Contact: 75	ECTS	5
Professor(s)	Maria Elisabete Santos Soares, Ph.D.					
<input checked="" type="checkbox"/> Area/Group Coordinator <input type="checkbox"/> Head of Department	(select)	Maria Elisabete Santos Soares, Ph.D.				

## PLANNED SUBJECT DESCRIPTION

### 1. LEARNING OBJECTIVES

*Providing to the students knowledges about methods and acquisition of satellite images of Earth Surface; technics of exploration, interpretation and manipulation of digital images and their application for the territorial analysis.*

### 2. PROGRAMME

1. Components of remote sensing systems.
2. Electromagnetic radiation.
3. Spectral identification of the nature elements.
4. Acquisition of satellite's images. Quality and distortion in digital images. Pixel/resolution of remote's sensing images.
5. Vehicles and sensors used to acquire images. Active and passive systems.
6. Store structures of geographic data.
7. Orientation of linear satellite images.
8. Digital processing of remotely sensed images. Exploration and analysis of digital images. Multispectral classification of satellite images.
9. Remote sensing application and techniques for the study and territorial analysis. IDRISI Taiga software.

### 3. COHERENCE BETWEEN PROGRAMME AND OBJECTIVES

*The contents of the subject is developed in such a way that the student learns what he/she needs to interpret, explore and treat images of remote sensing in order to extract geographic information for the development of studies related to ground cover. In this context, the means and techniques for acquiring and registering images of the Earth's surface from space platforms are taught in addition to procedure for automatic treatment of digital images. In the end, the student should know how to differentiate among the various types of spectral cover of the Earth's surface, the respective acquisition platforms and their application in territorial analysis.*

### 4. MAIN BIBLIOGRAPHY

*Essential:*

- [1] Theoretical and practical texts produced by professor.
- [2] Fonseca, Ana; Fernandes, João C. (2004) *Deteção Remota*. Lidel – Edições Técnicas, Lda.
- [3] *Introdução às imagens digitais e às técnicas de análise digital* (1996) Alföldi, T. CCRS. Ottawa, Canadá.
- [4] Warner, Timothy A., Campagna, David J. (2009) *Remote Sensing with IDRISI Taiga – A Beginner's Guide*.

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[5] Eastman, Ronald J. (2009) Idrisi Taiga – Tutorial.

Recommended:

[1] Buiten, Henk J., Clevers, Jan G.P.W. (1996) Land observation by Remote Sensing theory and applications. Current Topics in Remote Sensing Volume 3. Gordon and Breach Science Publishers.

[2] Campbell, James B. (1996) Introduction to Remote Sensing. Taylor & Francis, Ltd.

[3] Cracknell, Arthur; Hayes, Ladson, Introduction to Remote Sensing.

[4] Lillesand, Thomas M.; Kiefer, Ralph W., Remote Sensing and Image Interpretation.

[5] Mather, Paul M. (1996) Computer processing of Remotly-Sensed images. John Wiley & Sons.

## 5. TEACHING METHODOLOGIES (INCLUDING EVALUATION)

Oral exposition about theory and practical contents. Audio-visual's resources and appropriate software (IDRISI Taiga).

Resolution of practical exercises with digital processing image software. Availability of e-learning contents.

Evaluation continuous: 3 theoretical tests (75%) + practical works (25%) with presentation and discussion.

Evaluation not continuous: theoretical test (75%) + practical works (25%) with presentation and discussion.

## 6. COHERENCE BETWEEN TEACHING METHODOLOGIES AND OBJECTIVES

In addition to lectures on theory, the content is transmitted in a way that enables the student to understand the type of register and the matrix structure of a digital image in order to explore images of the Earth's surface and carry out applied studies on their own. The use of software to digital image processing contributes to an understanding of the techniques for remote sensing related to the extraction of geographic information. Learning is reinforced through research topics and practical assignments – directed at real problems – which the student presents to the class. This approach promotes both discussion of the various topics and sharing of acquired knowledge.

## 7. ATTENDANCE

Nothing to refer.

## 8. CONTACTS AND OFFICE HOURS

e-mail: [esoares@ipg.pt](mailto:esoares@ipg.pt)

Office 71

Office hours: Tuesday, 3:30 pm to 5:30 pm.

## 9. OTHERS

The student must use the computers in the classroom only for the purposes indicated by the teacher, being responsible for any damage that arises from their inappropriate use.

## DATE

15 de março de 2024

## SIGNATURES

<p><b>POLI</b>  <b>ESCOLA SUPERIOR</b>  <b>TECNOLOGIA</b>  <b>GESTÃO</b></p> <p><b>TÉCNICO</b>  <b>GUARDA</b></p>	<p><b>SUBJECT DESCRIPTION</b></p>	<p><b>MODELO</b>  PED.013.03</p>
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Professor

(Maria Elisabete Santos Soares)

Area Coordinator

(Maria Elisabete Santos Soares)