



## IDENTIFYING DATA

### (\*)Sistemas de imaxe

Subject	(*)Sistemas de imaxe			
Code	V05G300V01633			
Study programme	(*)Grao en Enxeñaría de Tecnoloxías de Telecomunicación			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Mandatory	3rd	2nd
Teaching language	Spanish			
Department				
Coordinator	Docio Fernández, Laura			
Lecturers	Docio Fernández, Laura Martín Rodríguez, Fernando			
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Web	<a href="http://fatic.uvigo.es">http://fatic.uvigo.es</a>			
General description	In this course we study several families of image systems, including computer vision, remote sensing and medical imaging.			

## Competencies

Code	
A3	CG3: The knowledge of basic subjects and technologies that capacitates the student to learn new methods and technologies, as well as to give him great versatility to confront and update to new situations
A43	CE34/SI1 The ability to construct, exploit and manage telecommunication services and applications, such as receiving, digital and analogical treatment, codification, transporting and representation, processing, storage, reproduction, management and presentation of audiovisual and multimedia information services.
A75	(CE66/OP9) The ability for selection of circuits, subsystems and systems of remote sensing.

## Learning aims

Expected results from this subject	Training and Learning Results
To know the most common image systems systems for diagnosis, testing and remote sensing.	A3 A43 A75
Comprehension of the operation principles of such systems.	A3 A43 A75
Comprehension of the capabilities and limitations of such systems.	A3 A43 A75
To know the most common applications of such systems.	A43 A75

## Contents

Topic	
Artificial vision systems	Systems of illumination (LED, Laser, fluorescence), monochrome cameras, Bayer colour and 3 CCD, of field and line, frame grabbers, multi-camera systems (mono/stereo)
Medical imaging and non destructive testing (NDT) systems	Generation and processing of ultrasonography, X-ray, computed axial tomography, nuclear magnetic resonance, and positron emission tomography.

Aerial, satellite and proxy remote sensing systems

Acquisition, processing and application of panchromatic, monoband, multispectral, and hyperspectral active and passive images, in UV/VIS/SWIR/NIR/FIR/Thermal/GHz, Radar and Lidar.

### Planning

	Class hours	Hours outside the classroom	Total hours
Practice in computer rooms	12	23.5	35.5
Tutored works	7	43	50
Master Session	21	41.5	62.5
Long answer tests and development	2	0	2

\*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

### Methodologies

	Description
Practice in computer rooms	Use and adjustment of analysis tools and algorithms, identifying which ones should be used in each posed situation.
Tutored works	Work in group developing the contents seen in the theory classes, with personalised attention.
Master Session	Presentation by the teacher of the contents of the subject, fostering the critical discussion of the concepts.

### Personalized attention

Methodologies	Description
Practice in computer rooms	Students will have the opportunity to solve doubts in personalised attention sessions. These sessions will take place: - Individually or in reduced groups (typically with a maximum of 2-3 students). - Unless otherwise stated, with previous appointment with the corresponding teacher. The appointment should be required and agreed by e-mail, preferably in the timetable and place officially assigned.
Tutored works	Students will have the opportunity to solve doubts in personalised attention sessions. These sessions will take place: - Individually or in reduced groups (typically with a maximum of 2-3 students). - Unless otherwise stated, with previous appointment with the corresponding teacher. The appointment should be required and agreed by e-mail, preferably in the timetable and place officially assigned.

### Assessment

	Description	Qualification
Practice in computer rooms	Personalized follow-up of the student's laboratory work, giving him indication of his evolution.	50
Tutored works	The evaluation of the work realized will be done through the collection of evidences during its development, the final report and its presentation.	50
Long answer tests and development	Examination concerning the contents seen in the subject.	0

### Other comments on the Evaluation

Except in exceptional circumstances class attendance on continuous assessment is mandatory. Continuous assessment is used to evaluate the course and it is based on the student's work in the laboratory and the supervised work on the contents of the subject. In May there is a final exam on the official date to those students who have not passed the continuous assessment and want to pass the course. The final exam will be graded between 0 and 10 points and it includes all course topics. To pass this final exam students must obtain at least five points. Students who wish to improve their continuous assessment grade may attend to final exam. In this case the grade obtained in this final exam will be the final grade of the course. Students who have passed the continuous assessment and are satisfied with your grade does not need to attend at this final exam. Throughout the four-month period the students will receive information about their progress in the continuous assessment. The final grade of the continuous assessment will be communicated to students in the last class, always before the final exam. Delivery of the supervised work will be the last week of class and will mean the official participation in the continuous assessment. The latter means have been presented to the subject although the student has not made the final exam.

The additional assessment in July will consist of a final exam for those students who have not passed neither the continuous assessment nor the final exam in May. In both cases the final grade for the course will be the grade of this final exam. This final exam will be graded from 0 to 10 points, and it includes all the topics of the subject. To pass the course students must obtain at least five points.

Note that there is no two calls but this one is unique, although there are two final exams.

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### **Sources of information**

Arnulf Oppelt, **Imaging Systems for Medical Diagnostics**, 2<sup>a</sup>,

John Robert Schott, **Remote Sensing: The Image Chain Approach**, 1<sup>a</sup>,

Oleg S. Pinykh, **Digital Imaging and Communications in Medicine (DICOM)**, 2<sup>a</sup>,

Michael Vollmer and Klaus-Peter Möllmann, **Infrared Thermal Imaging: Fundamentals, Research and Applications**, 1<sup>a</sup>,

Erik Reinhard et al., **Color Imaging: Fundamentals and Applications**, 1<sup>a</sup>,

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### **Recommendations**

#### **Subjects that are recommended to be taken simultaneously**

(\*)Fundamentos de procesado de imaxe/V05G300V01632

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#### **Subjects that it is recommended to have taken before**

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