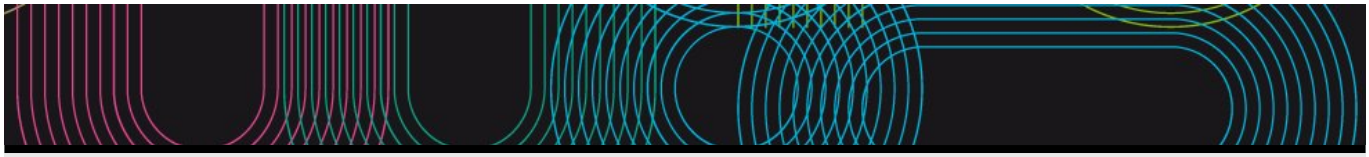

IDENTIFYING DATA				
Fundamentals of Image Processing				
Subject	Fundamentals of Image Processing			
Code	V05G300V01632			
Study programme	(*)Grao en Enxeñaría de Tecnoloxías de Telecomunicación			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Optional	3rd	2nd
Teaching language	Spanish Galician			
Department				
Coordinator	Martín Herrero, Julio			
Lecturers	Martín Herrero, Julio			
E-mail	julio@uvigo.es			
Web	http://faitic.uvigo.es			
General description	Introduces to the student the basics of digital image processing			

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
A4	CG4: The ability to solve problems with initiative, to make creative decisions and to communicate and transmit knowledge and skills, understanding the ethical and professional responsibility of the Technical Telecommunication Engineer activity.
A43	CE34/SI1The 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.
A47	CE38/SI5 The ability to create, modify, manage, broadcast and distribute multimedia contents taking into account the use and accessibility criteria to audiovisual, broadcasting and interactive services.
B1	The ability for critical reading of scientific papers and docs.

Learning aims		
Expected results from this subject	Training and Learning Results	
Understand the nature and organisation of digital images	A43	
Learn to process digital images	A47	
Learn how to program a computer to process a digital image	A3	
Understand how the fundamental technics of image processing work	A4	
Apply fundamental processing technics to solve specific problems with images or groups of images	A4	
Capacity to do critical reading of scientific documents		B1

Contents	
Topic	
Basic preprocessing.	Histogram. Brightness and contrast.
Global and local operators.	Linear and nonlinear filters.
Binary and greyscale mathematical morphology.	Erosion. Dilatation. Opening. Closing.
Geometrical transformations. Image transforms.	Affine transformations.
Image compression.	JPEG. JPEG 2000.
Image restoration.	Linear and nonlinear filters.

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
Practical tests, real task execution and / or simulated.	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	Handling and tuning analytic tools and algorithms, identifying which ones to use in different scenarios. All learning aims are addressed.
Tutored works	Groupwork developing the contents dealt with in the classroom, with personalised attention. All learning aims are addressed.
Master Session	Pleanry talks by the teacher on central topics, promoting critical discussion of concepts. All learning aims are addressed.

Personalized attention

Methodologies	Description
Practice in computer rooms	Tutoring meetings will be used to solve doubts. These meetings will be: * Individually or in small groups. * Except where otherwise indicated, by previous appointment with the teacher. Appointments can be requested verbally or by email, preferably at the times and location reserved officially.
Tutored works	Tutoring meetings will be used to solve doubts. These meetings will be: * Individually or in small groups. * Except where otherwise indicated, by previous appointment with the teacher. Appointments can be requested verbally or by email, preferably at the times and location reserved officially.

Assessment

	Description	Qualification
Practice in computer rooms	Personalised monitoring of the student's work in the laboratory, with feedback. All teaching aims specified in the corresponding section of this guide are evaluated.	50
Tutored works	Assessment of the work done, itscontent and its presentation. All teaching aims specified in the corresponding section of this guide are evaluated.	50
Practical tests, real task execution and / or simulated.	Real programming and problem solving. All teaching aims specified in the corresponding section of this guide are evaluated.	0

Other comments on the Evaluation

The assistance to class under continuous evaluation is compulsory, unless exceptional circumstances concur. Continuous evaluation is used for assessment, based in the work of the student in the classroom and at home. There is a final exam in the official date marked by the Board of School in May, for those students that have not passed the continuous evaluation. This final exam will be marked between 0 and 10 points. It covers all the subjects seen during the semester. To approve, the student has to obtain, at least, five points. Students wishing to improve their continuous evaluation marks can also attend the final exam: in this case the mark of this exam will be the final mark. The students that have passed the continuous evaluation and are satisfied with their mark do not need to attend the final exam. Along the semester the students will receive feedback on their progress, and the final mark of continuous evaluation will be communicated to the students well before the final exam. The delivery of the personal work the last week of class will imply the official participation in continuous evaluation.

The extraordinary evaluation of July will be an extraordinary final exam, for those students that have not passed neither the continuous evaluation neither the final exam in May. The final mark will be the mark of the extraordinary final exam in both cases. This extraordinary final exam will be marked between 0 and 10 points, and covers all the subjects. To approve, the student has to obtain, at least, five points.

Note that there are two final exams, but both correspond to a single and the same call ("convocatoria").

Sources of information

Rafael C. Gonzalez, Richard E. Woods, **Digital Image Processing**, 3ª,

Robert Laganière, **OpenCV 2 Computer Vision Application Programming Cookbook**, 2011,

Jasmin Blanchette, Mark Summerfield, **C++ GUI Programming with Qt 4**, 2008,

Recommendations

Subjects that continue the syllabus

Image Processing and Analysis/V05G300V01931

Subjects that are recommended to be taken simultaneously

Imaging Systems/V05G300V01633

Subjects that it is recommended to have taken before

Programming I/V05G300V01205
Fundamentals of Sound and Image/V05G300V01405
Digital Signal Processing/V05G300V01304