

## 60935 - Digital image and video processing

### Información del Plan Docente

Academic Year	2016/17
Academic center	110 - Escuela de Ingeniería y Arquitectura
Degree	533 - Master's Degree in Telecommunications Engineering
ECTS	5.0
Course	2
Period	First semester
Subject Type	Optional
Module	---

### 1.Basic info

#### 1.1.Recommendations to take this course

#### 1.2.Activities and key dates for the course

### 2.Initiation

#### 2.1.Learning outcomes that define the subject

#### 2.2.Introduction

### 3.Context and competences

#### 3.1.Goals

#### 3.2.Context and meaning of the subject in the degree

#### 3.3.Competences

#### 3.4.Importance of learning outcomes

### 4.Evaluation

### 5.Activities and resources

#### 5.1.General methodological presentation

M1. Lectures .

M9: Computer lab sessions .

M4: Project .

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**M10: Tutorship.**

**M11: Assessment .**

### 5.2.Learning activities

**M1. Lectures** (24 hours).

**M9: Computer lab sessions** (26 hours). 2 hours sessions taking place every week.

Scientific programming environments, such as octave or matlab, are the main tools during lab sessions. Students will develop skills for coping with practical work with images or video sequences. The theoretical contents of the lectures are reviewed from a practical point of view.

**M4: Project** (20 hours). Optional project.

Individually or by couples, students decide whether they want to develop a project related to the subject contents. The particular issue to be addressed, the goals or the final delivery results in each case are negotiated with the tutor in a first meeting. There will be, at least, another final meeting for the delivery and presentations of the results.

As an example, projects can consist on working on scientific papers developed under the reproducible research framework (the authors made available the implementation of their contributions, so that other researchers can reproduce their results or redefine experiments).

**M11: Assessment.** Explained in the evaluation item.

### 5.3.Program

#### Module 1 BASIC ASPECTS

1 Introduction

2 Sampling, acquisition and display

3 Point operators

4 Geometric transforms

#### Module 2 LOCAL PROCESSING

5 General aspects of local processing

6 Linear filtering

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7 Nonlinear filtering

### Module 3 MULTIDIMENSIONAL TRANSFORMS

8 Theoretical aspects of 2D and 3D Transforms

9 Applications

### Module 4 VIDEO

10 Applications: Video segmentation and coding

## 5.4.Planning and scheduling

The course calendar is defined by the Escuela de Ingeniería y Arquitectura calendar.

## 5.5.Bibliography and recommended resources

- Marques, O. Practical Image and Video Processing Using MATLAB / O. Marques Wiley-IEEE Press, 2011
- González, R.C. Digital Image Processing using Matlab / R.C. González, R.E. Woods, S.L. Eddins Prentice Hall, 2004
- Handbook of image and video processing / editor AI Bovik. - 2nd ed. Burlington [Massachusetts] : Elsevier Academic Press, cop. 2005
- Castleman, Kenneth R.. Digital image processing / Kenneth R. Castleman Upper Saddle River, New Jersey : Prentice-Hall, cop. 1996
- Jain, Anil K.. Fundamentals of digital image processing / Anil K. Jain Englewood Cliffs (New Jersey) : Prentice Hall, cop. 198
- Pratt, William K.. Digital image processing / William K. Pratt . - 2nd ed. New York [etc.] : John Wiley and Sons, cop. 1991
- Dudgeon, Dan E.. Multidimensional digital signal processing / Dan E. Dudgeon, Russell M. Mersereau Englewood Cliffs ; London : Prentice-Hall, cop. 1984
- Lim, Jae S.. Two-dimensional signal and image processing / Jae S. Lim Englewood Cliffs, New Jersey : Prentice Hall, cop. 1990