1. GENERAL

SCHOOL	ENGINEERING		
DEPARTMENT	PRODUCT AND SYSTEMS DESIGN ENGINEERING		
LEVEL OF STUDIES	UNDER GRADUATE		
COURSE CODE	**4102**	**SEMESTER**	**7th**
COURSE TITLE	**IMAGE PROCESSING**		
INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures		**3**	**6**
Laboratory			
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).			
COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Special background		
PREREQUISITE COURSES:			
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK/ENGLISH		
COURSE DELIVERED TO ERASMUS STUDENTS	YES		
MODULE WEB PAGE (URL)	https://eclass.uowm.gr/courses/MRE263		

2. LEARNING OUTCOMES

Learning outcomes
The course covers the following topics: Introduction to digitization and processing of one-dimensional signal. Fast Fourier Transform (FFT). Image digitization (two-dimensional signal). Application of 2D FFT to digital image. Image filtering (quality improvement). Image compression. Edge detection. Image segmentation (use of separation threshold, separation and merging of areas based on geometric proximity of image elements). Image color processing. Motion detection in image. The opencv open source library will also be imported and used. Upon successful completion of the course, the student should be able to: • Apply algorithms to restore or improve an image. • Apply algorithms that allow modification of colors in an image. • Apply algorithms that allow the transformation of a color image into a black and white image and vice versa. • Apply algorithms that extraction of elements from an image.

General Skills
This course aims to give students the necessary theoretical background on image capture and representation techniques, as well as image enhancement, image modification, image compression, image segmentation, and object recognition methodologies.

3. COURSE CONTENTS

- Image Representation
- Image Filtering and Enhancement (both in Spatial and Fourier domain)
- Recovering Image Quality
- Image Color Processing
- Image Compression
- Image Morphology and Segmentation
- Object Recognition

4. TEACHING METHODS - ASSESSMENT

MODE OFDELIVERY	1. THEORY In class, face to face
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	● Use of appropriate software ● Video and slide presentations via projector ● Support of teaching process via the electronic platform e-class
TEACHING METHODS	
ASSESSMENT METHODS	1. (60%) Final written exam which includes: i. Short-answer questions ii. Multiple choice questions iii. Problem solving 2. (40%) Homework

Activity	*Semester workload*
Lectures	50
Homework	50
Non-directed study	50
Course total	**150**

5. ATTACHED

- Suggested bibliography:

- **Gonzalez C. Rafael, Woods Richard, 2017, Digital Image Processing, 4th Edition, Pearson, ISBN: 978-0133356724**