1. GENERAL

SCHOOL	ENGINEERING		
DEPARTMENT	PRODUCT AND SYSTEMS DESIGN ENGINEERING		
LEVEL OF STUDIES	UNDER GRADUATE		
COURSE CODE	**4108**	**SEMESTER**	**9th**
COURSE TITLE	**COMPUTER VISION**		

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*	Specialised general knowledge
PREREQUISITE COURSES:	
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK/ENGLISH
COURSE DELIVERED TO ERASMUS STUDENTS	YES
MODULE WEB PAGE (URL)	https://eclass.uowm.gr/courses/MRE266

2. LEARNING OUTCOMES

Learning outcomes

One of the key elements that an autonomous interactive system must have is the ability to perceive the space and environment in which it is located. Computer vision comes to provide solutions to problems of object recognition, scene comprehension, reconstruction of models of three-dimensional entities from two-dimensional images, video analysis (motion, point monitoring), etc. The aim of the course is to present the basic topics of computational vision and to build on the knowledge gained from the courses Graphics and Image Processing. In the lesson, the opencv open source library will be used.

Upon successful completion of the course, the student should be able to:

- Implement real-time image capture scenarios (simple and stereoscopic).
- Process the image in order to detect features in it.
- Apply image segmentation techniques aiming to separate objects and their areas in order to facilitate further processing and object description.
- Compose a panoramic image from its parts based on the alignment of common features.
- Understand the technology for detection and recognition of objects in the image.

General Skills

This course aims to give students the necessary theoretical background for processing an image in order to extract information that contributes to the recognition of objects in the image and the understanding of the scenery.

3. COURSE CONTENTS

- Image formation
- Image processing
- Feature detection and matching
- Image Segmentation
- Feature-based alignment
- Structure from motion
- Classification
- Detecting Objects in Images

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	

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

ASSESSMENT METHODS	1. (60%) Final written exam which includes: i. Short-answer questions ii. Multiple choice questions iii. Problem solving 2. (40%) Homework

5. ATTACHED

- Suggested bibliography:

- **Forsyth D. and Ponce J., 2011, Computer Vision: A Modern Approach, 2nd edition, Prentice Hall, ISBN: 978-0136085928**
- **Prince S., 2012, Computer Vision: Models, Learning and Inference, Cambridge, University**

Press, ISBN: 978-1107011793

- **Szeliski R., 2011, Computer Vision: Algorithms and Applications, Springer Verlag, ISBN: 978-1848829343**