1. GENERAL

SCHOOL	ENGINEERING		
DEPARTMENT	PRODUCT AND SYSTEMS DESIGN ENGINEERING		
LEVEL OF STUDIES	UNDER GRADUATE		
COURSE CODE	**3102**	**SEMESTER**	**6th**
COURSE TITLE	**COMPUTER GRAPHICS**		

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/MRE262

2. LEARNING OUTCOMES

Learning outcomes

Computer graphics refer to techniques and algorithms that allow the design of two-dimensional shapes as well as the projection and display of three-dimensional objects on the plane of the computer screen and their partial or total visibility on the computer screen which is considered a window in the corresponding plane.

Initially, this course introduces the techniques for graphically displaying basic shapes on a two-dimensional computer screen, such as a straight line, a circle, a zigzag line, a polygon, and filling in closed shapes with color. Next, the transformations that allow the movement of shapes and the change of the coordinate system in both two-dimensional space (2D) and three-dimensional space (3D) are examined. In the three dimensions, additional issues of projection and point of view are examined, as well as the modeling of curves and surfaces in the space. Also presented are photometry issues and coloring models, as well as the issue of identifying the visible parts of 3D objects depicted on a camera. It also introduces the graphical Application Programming Interfaces (APIs) Direct 2D, Direct 3D, OpenGL.

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

- Write code that allows drawing of two-dimensional shapes on a computer screen.
- Write code that allows the transformation (rotations and shifts) of two-dimensional shapes that are displayed on a computer screen.
- Write code that allows 3D shapes to be projected on the computer screen from various positions of view in the 3D space.
- Can use standard libraries (such as OpenGL) to compose computer graphics.
- Be able to work on the development of the various parts of a CAD program.

General Skills

This course aims to teach students with basic techniques and algorithms that allow the development of graphics programs that display objects on the computer screen. As an additional result, the student is given the ability to understand the internal operation of existing CAD programs and to intervene creatively in their operation through special libraries that are offered for these programs.

3. COURSE CONTENTS

- Two-dimensional drawing
- Geometric transformations and projections in two and three dimensions
- Representation of 3D objects
- Color and texture
- Lighting models
- Representation and management of graphics scenery
- Synthetic movement

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:

- **Κ. Μουστάκας, Ι. Παλιόκας, Α. Τσακίρης, Δ. Τζοβάρας, 2015, "Γραφικά και Εικονική Πραγματικότητα", [ηλεκτρ. βιβλ.] Αθήνα: Σύνδεσμος Ελληνικών Ακαδημαϊκών Βιβλιοθηκών. Διαθέσιμο στο: http://hdl.handle.net/11419/4491, ISBN: 978-9606032554**