

Course Unit	Computer Graphics	Field of study	Computing Science
Bachelor in	Game Design	School	School of Public Management, Communication and Tourism
Academic Year	2017/2018	Year of study	2
Type	Semestral	Semester	1
Level	1-2	ECTS credits	6.0
Code	8309-414-2102-00-17		
Workload (hours)	162	Contact hours	T - TP 15 PL 45 TC - S - E - OT - O -

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s) Miguel Angelo Correia de Melo

#### Learning outcomes and competences

- At the end of the course unit the learner is expected to be able to:
1. Master the Fundamentals of 2D and 3D Computer Graphics
  2. Develop Interactive Real-Time Rendering Applications
  3. Set up a 3D Rendering Environment
  4. Use the OpenGL functions to build Basic Objects and Lighting
  5. Recognize the importance of Computer Graphics in Digital Game Development

#### Prerequisites

Not applicable

#### Course contents

Concepts of Computer Graphics. Development of Real-Time Interactive Applications. Placement of Computer Graphics in the Development of Digital Games.

#### Course contents (extended version)

1. Introduction to Computer Graphics
2. Introduction to OpenGL
  - Basic 3D Programming Principles
  - Summary of the OpenGL Pipeline
3. Geometric Primitives and Buffers
  - OpenGL Primitives
  - Solid Objects
4. Geometric Transformations - The OpenGL Pipeline
  - Using Projections
  - Cameras and Actors
5. Colors, Materials and Lighting
  - Colors and Materials
  - Lighting and Effects
  - Blending and Fog
6. OpenGL Imaging
7. Texture Mapping
8. Curves and Surfaces
9. Importing external Assets
10. Advanced Concepts

#### Recommended reading

1. Wright, R. , & Lipchak, B. (2005). Opengl Superbible. Indianapolis: SAMS, ISBN-10: 0321902947
2. Angel, E. , (1997). Interactive Computer Graphics. Boston: Addison-Wesley, ISBN-10: 0133574849
3. Watt, A. , (2000). 3d Computer Graphics. Boston: Addison-Wesley, ISBN-10: 0201398559
4. Foley, J. , Van, A. , K. , S. , & Hughes, J. (1997). Computer Graphics. Boston: Addison-Wesley, ISBN-10: 0201848406

#### Teaching and learning methods

The course will be taught using lectures on theoretical concepts, practical lessons in problem solving and self-learning guided by the teacher.

#### Assessment methods

- Alternative I - (Regular, Student Worker) (Final, Supplementary, Special)
  - Practical Work - 60%
  - Reports and Guides - 25% (Practical Work Report and Presentation)
  - Presentations - 15%

#### Language of instruction

Portuguese

#### Electronic validation

Miguel Angelo Correia de Melo	Daniel Ribas de Almeida	Vítor José Domingues Mendonça	Luisa Margarida Barata Lopes
22-10-2017	09-12-2017	11-12-2017	19-12-2017