INSTITUTO POLITÉCNICO DE BRAGANÇA

Course Unit	Game Engines			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	Level	1-2	ECTS credits	6.0						
Type	Semestral	Semester	2	Code	8309-414-2203-00-17								
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 - Tuturial; O - Other

Name(s) of lecturer(s): João Paulo Pereira de Sousa

Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:
1. Recognize the main components of a game engine;
2. Outline strategies and identify requirements for the development of digital games;
3. Integrate preexisting assets using resources provided by the game engine;
4. Create games and interactive applications using the existing game engines, namely with Unity.

Prerequisites

Before the course unit the learner is expected to be able to:
Basic concepts of programming.

Course contents

Introduction to digital games development. Game engines overview. Games development and interactive applications using game engines, namely Unity3D.

Course contents (extended version)

1. Introduction do Computer Game Development
2. Game Level Design
   - 3D Space Navigation
   - GameObjects and Prefabs
   - Materials and Textures
   - Light and Lightmapping
   - Terrain
   - Particle Systems
   - Camera Configuration
   - Adding Audio
   - Woking with sprites.
3. Physics System
   - Rigidbody
   - Colliders
   - Controllers
   - Joints
   - Cloth
4. Animação
   - Creating Animation Clips (Animation VIew/Mecanim)
   - Character Animation (Rigged)
5. Scripting
   - C# Introduction
   - Variables, Components and GameObjects
   - 3D Vector Geometry
   - Movement Generation
   - Animation System
6. Augmented Reality and Virtual Reality
7. Game/Application Deployment

Recommended reading

1. Hocking, J. (2015). Unity in Action: Multiplatform Game Development in C# with Unity 5 1st Edition. Manning Publications. [ISBN: 161729232X]
2. Okita, A. (2014). Learning C# Programming with Unity 3D. A K Peters/CRC Press [ISBN: 1849691843]
3. Hirata, A. I. (2011). Desenvolvendo Games com Unity 3D - Space Invasion. Ciência Moderna. [ISBN: 1466586524]
4. Unity Team, (2016). Unity official documentation, retrieved from, http: //unity3d. com/learn/documentation

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

1. Continuos assessment - (Regular, Student Worker) (Final, Supplementary, Special)
   - Practical Work - 70% (Game or Interactive Application created with Unity3D ou other similar game engine.)
   - Development Topics - 30% (A development subject: Work Report of Investigation.)
2. Erasmus Students - (Regular) (Final, Supplementary)
   - Practical Work - 70% (Game or Interactive Application created with Unity3D ou other similar game engine.)
   - Development Topics - 30% (A development subject: Work Report of Investigation.)

Language of instruction

Portuguese, with additional English support for foreign students.

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Electronic validation

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21-02-2018	22-02-2018	07-03-2018	07-03-2018

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