

## COURSE DESCRIPTION

### 1. GENERAL

SCHOOL	MUSIC AND AUDIOVISUAL ARTS		
DEPARTMENT	AUDIO AND VISUAL ARTS		
LEVEL	Undergraduate		
COURSE CODE	AVA745	SEMESTER	7 <sup>th</sup>
COURSE TITLE	Digital Composing of Virtual Environments		
INDEPENDENT TEACHING ACTIVITIES		WEEKLY TEACHING HOURS	ECTS
Lecture, Lab Lecture		2	4
COURSE CATEGORY	Deepening Knowledge		
COURSE TYPE	Elective		
PREREQUISITES	(VIS830), (THE104), (TEC414), (AUD521), (TEC311)		
LANGUAGE OF TEACHING and EXAMINATIONS	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS	YES (In English)		
URL	<a href="https://avarts.ionio.gr/en/studies/undergraduate/courses-descriptions/ava745/">https://avarts.ionio.gr/en/studies/undergraduate/courses-descriptions/ava745/</a>		
ECLASS	<a href="https://e-class.ionio.gr/courses/DAVA199">https://e-class.ionio.gr/courses/DAVA199</a>		

### 2. TEACHING RESULTS

<b>Teaching Results</b>
<p>The objective of the course is to provide to the students the means to understand the why virtual worlds are constructed and how these worlds interact with the user.</p> <p>The successful attendance of the course offers the ability to the corresponding students to:</p> <ul style="list-style-type: none"> <li>• use the Unity engine to create virtual environments</li> <li>• write programming code in C# in order to create interactions to the virtual environments</li> <li>• create simple 3d or 2d videogames</li> </ul>
<b>General Skills</b>
<ul style="list-style-type: none"> <li>• Seek, analyze and synthesize data</li> <li>• Autonomous work</li> <li>• Team work</li> <li>• Project design and management</li> <li>• Freedom of thought</li> </ul>

### 3. CONTENT

<p>Presentation of the basic concepts, definitions and principles of virtual reality, as well as of the digital virtual world composition methods. Creation of virtual 3D real time environments and of the proper digital content, using contemporary specialised software and methods. Designing and creation of intelligent interactive object models and user's interface. Combining sound and image devices and special controls for developing experimental virtual environment installations. Examples of artistic expression media and generally of complete interactive works through the use of advanced techniques and virtual reality technologies. Critical analysis of the production procedure of a complete 3D virtual environment application. Finally, the students' projects are presented and analysed.</p> <p>1st Week</p>
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General introduction to the course and to Unity engine. Inserting objects to the environment and description of the corresponding parameters (coordinates, rotations etc). Tools of the application.

2nd Week

Basic elements of objectoriented programming and of C# programming language. Unity scripting. Examples of simple programmes in C#

3rd Week

Moving objects in the virtual environment with coding (translate, rotate). Use of the corresponding function. Using keyboard to interact with the environment.

4th Week

Using Unity tools in order to create virtual terrain and natural environment (mountain, trees, valleys etc). Inserting textures to the environment.

5th Week

Description of Unity prefabs in order to create custom objects. Inserting to the environment the First Person Controller and its basic properties.

6th Week

Example: moving platform with user interaction. Using functions and variables for the movement.

7th Week

Physics in Unity. Solids, gravity, friction, elasticity. Examples with forces, torque, restrictions etc.

8th Week

Using the graphic user interface of Unity (GUI). Menus, texts UI, pictures

9th Week

Creating different scenes to the virtual environment. Changing levels of the videogame with code in C#. The use of buttons.

10th Week

Sprites for 2d animation creation in Unity.

11th Week

Description of the Unity avatar and the android Third Person Controller (Ethan). Animation of the character with the state tree.

12th Week

Example: opening and closing doors. The methods OnTriggerEnter() and OnCollisionEnter() for user interaction.

13th Week

General course overview – talk about students' projects for the course.

#### 4. TEACHING AND LEARNING METHODS - EVALUATION

<b>TEACHING METHOD</b>	Lectures												
<b>USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES</b>	Enhanced by multimedia content. The learning process is supported by the asynchronous e-learning platform e-class.												
<b>TEACHING STRUCTURE</b>	<table> <tr> <td>Activity</td><td>Semester Workload</td></tr> <tr> <td>Lectures</td><td>13</td></tr> <tr> <td>Lab Lectures</td><td>13</td></tr> <tr> <td>Literature Study and Analysis</td><td>48</td></tr> <tr> <td>Practice and Preparation</td><td>26</td></tr> <tr> <td><b>Course Total (ECTS: 4)</b></td><td><b>100</b></td></tr> </table>	Activity	Semester Workload	Lectures	13	Lab Lectures	13	Literature Study and Analysis	48	Practice and Preparation	26	<b>Course Total (ECTS: 4)</b>	<b>100</b>
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<b>Course Total (ECTS: 4)</b>	<b>100</b>												
<b>EVALUATION OF STUDENTS</b>	The evaluation is a result of the final project, namely a virtual world or a videogame												

#### 5. BIBLIOGRAPHY

2015. Thorn, Mastering Unity Scripting | PACKT Books. Packt Publishing, 2015.  
2016. Dr. Lavieri, Getting Started with Unity 5: Packt Publishing, 2015.