

COURSE OUTLINE

GENERAL

SCHOOL	Sciences and Engineering		
ACADEMIC UNIT	Computer Science		
LEVEL OF STUDIES	1 st Cycle		
COURSE CODE	COMP-410	SEMESTER	Fall / Spring
COURSE TITLE	Virtual Reality Game Development		
INDEPENDENT TEACHING ACTIVITIES <i>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</i>	WEEKLY TEACHING HOURS	CREDITS	
	2.5	6	
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Specialization		
PREREQUISITE COURSES:	COMP-213		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	English		
IS THE COURSE OFFERED TO ERASMUS STUDENTS			
COURSE WEBSITE (URL)			

LEARNING OUTCOMES

<p>Learning outcomes <i>The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.</i></p> <p><i>Consult Appendix A</i></p> <ul style="list-style-type: none"> ● <i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</i> ● <i>Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</i> ● <i>Guidelines for writing Learning Outcomes</i>
<p>After completion of the course students are expected to be able to:</p> <ul style="list-style-type: none"> ● Design and develop Virtual Reality games using the Unity game engine. ● Implement VR applications utilizing the OpenXR runtime for multiple platforms. ● Create immersive and interactive VR experiences using the XR Interaction Toolkit. ● Deploy VR games to both PCVR systems and standalone Quest headsets. ● Solve technical challenges associated with VR development, such as performance optimization and user experience design. ● Demonstrate knowledge of VR hardware and software requirements. ● Collaborate effectively within a team to conceptualize and produce VR projects.

- Critically evaluate VR games and experiences in the context of design and user engagement.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology

Adapting to new situations

Decision-making

Working independently

Team work

Working in an international environment

Working in an interdisciplinary environment

Production of new research ideas

Project planning and management

Respect for difference and multiculturalism

Respect for the natural environment

Showing social, professional and ethical responsibility and sensitivity to gender issues

Criticism and self-criticism

Production of free, creative and inductive thinking

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Others...

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Search for, analysis and synthesis of data and information, with the use of the necessary technology

Adapting to new situations

Decision-making

Working independently

Project planning and management

Criticism and self-criticism

Production of free, creative and inductive thinking

SYLLABUS

- General Introduction to the XR Lab and VR history
- Introduction to Virtual Reality and Unity
- More Unity Basics and VR Concepts
- Introducing OpenXR and XR Interaction Toolkit
- Creating Interactive VR Environments and Assets
- The XR Simulator
- Developing a simple PCVR game using OpenXR
- Performance Optimization in VR
- Transitioning to Standalone VR Development
- Scripting in C#. Advanced Interactions and User Interfaces
- Cross-platform Development and Testing (Quest, HTC Vive)
- Final Project Development Brief

TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Face-to-face	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	<i>Use of ICT in teaching / Χρήση ΤΠΕ</i> <i>Communication with students / Επικοινωνία με Φοιτητές</i>	
TEACHING METHODS <i>The manner and methods of teaching are described in detail.</i>	Activity	Semester workload
	Lectures	35

<p>Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</p> <p>The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</p>	Preparation, homework, quizzes	25
	Projects	40
	Exam preparation	25
	Final Project	25
	Course total	150
<p>STUDENT PERFORMANCE EVALUATION</p> <p>Description of the evaluation procedure</p> <p>Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other</p> <p>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</p>	Assignments, Mid-Term exam, Final Project	

ATTACHED BIBLIOGRAPHY

Required Textbooks / Readings:				
Title	Author(s)	Publisher	Year	ISBN
Virtual reality	LaValle, Steven M.	Cambridge university press	2023	Available online: https://lavalle.pl/vr/
Recommended Textbooks / Readings:				
Unity Learn				https://learn.unity.com/
XR Interaction Toolkit				https://docs.unity3d.com/Packages/com.unity.xr.interaction.toolkit@latest
Oculus Developer Center				https://developers.meta.com/horizon/