Course Unit	Extended reality		Field of study	Game Design/Informatics	
Master in	Digital Game Design and Development		School	School of Public Management, Communication and Tourism	
Academic Year	2023/2024	Year of study	1	Level	2-1	ECTS credits	6.0
Type	Semestral	Semester	2	Code	5074-802-1204-00-23	

Workload (hours)	162	Contact hours	T	-	TP	23	PL	22	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)	João Paulo Pereira de Sousa, Roberto Ivo Fernandes Vaz

Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:
1. Understand the origin and evolution of XR technologies.
2. Identify technical and design requirements to implement XR solutions.
3. Transform and apply storyboards for XR experiences.
4. Design and develop XR solutions with authoring tools.
5. Analyze and think critically about XR solutions.

Prerequisites

Before the course unit the learner is expected to be able to:
Fundamental programming knowledge.

Course contents

This course will allow to know what they are and how to design and develop new user experiences for extended reality (XR). This is an introductory CU to XR that aims to understand the overview of the complete XR design process, discussing the various aspects involved in the creation of XR experiences and the best way to get started. It will also address methods and tools for physical and digital prototyping, which allow prototypes for XR devices.

Course contents (extended version)

1. Introduction to extended reality (XR)
   - Augmented Reality (AR)
   - Virtual reality (VR)
   - Mixed reality (MR)
2. Virtual worlds and interaction
3. XR solutions design
4. Perception in virtual environments
5. Input and output devices, tracking
6. Virtual reality systems operation, augmented reality
7. Project: Development of VR and AR solutions

Recommended reading

1. Cronin, I., Robert S., and Wozniak, S..(2020).The Infinite Retina: Spatial Computing, AR, and how a collision of new technologies are bringing about the next tech revolution.1edição. Packt Publishing.
2. Doerner, R., Broll, W., Grimm, P., & Jung, B. (2022).Virtual and Augmented Reality: Foundations and Methods of Extended Realities. Springer Nature.
3. Gokce, A., & Carrie, D. E. (2020). Designing, Deploying, and Evaluating Virtual and Augmented Reality in Education. IGI Global.
4. Hillmann, C. (2021). UX for XR: User Experience Design and Strategies for Immersive Technologies. Apress.
5. Pangilinan, E., Lukas, S., & Mohan, V.(2019). Creating Augmented and Virtual Realities:Theory and Practice for Next-Generation Spatial Computing. O'Reilly Media, Inc.

Teaching and learning methods

This curricular unit will use various methodologies, based on the Active Learning model, in which the student becomes the main agent of their learning.

Assessment methods

1. Final evaluation - (Regular, Student Worker) (Final, Supplementary, Special)
   - Case Studies - 35% (Case study (individual).)
   - Development Topics - 30% (Research work (individual/group).)
   - Projects - 35% (Practical project (group).)
2. Erasmus Students - (Regular, Student Worker) (Final, Supplementary)
   - Case Studies - 35% (Case study (individual).)
   - Development Topics - 30% (Research work (individual/group).)
   - Projects - 35% (Practical project (group).)

Language of instruction

Portuguese

Electronic validation

João Paulo Pereira de Sousa, Roberto Ivo Fernandes Vaz	Barbara Costa Vilas Boas Barroso	Anabela Neves Alves de Pinho	Luisa Margarida Barata Lopes
14-03-2024	14-03-2024	17-03-2024	17-03-2024