

COMPUTER GRAPHICS AND AUGMENTED REALITY (MASTED-01-09)				
DEGREE PROGRAM:		Master in integrated STEAM Education (MASTED)		
SEMESTER: First	TYPE: Basic	CREDITS: 3 ECTS	WORKLOAD: 75 hours	MENTORING: 5 hours/week
LANGUAGE: Portuguese/English				

OBJECTIVES

General	To understand the history, concepts, and fundamental theories about Augmented Reality.
Specific	<ul style="list-style-type: none"> To understand the state of the art regarding Augmented Reality applications, specifically in teaching; To know and use tools and technologies for the development of Augmented Reality and Computer Graphics solutions to support teaching.

SUBJECT MATTER

Augmented reality is one of the fastest-growing fields of technology, and this growth has promoted its application in areas such as Education. Using augmented reality, teachers can present the contents three-dimensional, allowing the student to have direct contact with these contents. In this subject we will address Human-Computer Interaction; Human Aspects (perception and representation); Technological Aspects (inputs and outputs); History of Augmented Reality and Computer Graphics; Introduction of Augmented Reality and Computer Graphics solutions applied to teaching; Usability and User Experience (UX) in Augmented Reality.

COMPETENCES

- C1: Developing knowledge and understanding in computer graphics and augmented reality.
- C2: Developing advanced cognitive and procedural skills associated with knowledge development and creation.
- C5: Developing of assess in order to evidence learning and to improve the learning process and the teaching practices.
- C9: Integrating the theoretical knowledge acquired throughout the course with field practice.
- C14: Developing advanced digital competences.
- C15: Developing digital pedagogy competences to use, plan and implement new technologies.

LEARNING OUTCOMES

Knowledge	<ul style="list-style-type: none"> • Curricular knowledge. • Knowledge of augmented reality concepts and methods suitable for teaching.
Skills	<ul style="list-style-type: none"> • To recognize the different approaches to augmented reality. • To use augmented reality to solve problems • To use augmented reality for improving teaching.
Attitudes/values	<ul style="list-style-type: none"> • Commitment for promoting the learning of all students. • Disposition to examining, discussing, questioning one's own practices. • Improvement of attitudes of research, innovation, collaboration, autonomous learning. • Disposition to flexibility and ongoing learning.

TEACHING METHODS

In theoretical classes, concepts and methodologies will be presented. Theories, models and the state of the art in the process of using Augmented Reality and Computer Graphics solutions applied to teaching will be discussed.

In practical classes, students will apply the concepts and methodologies in solving concrete problems, in the form of a project-based methodology.

EVALUATION

- Attendance and class participation: 20%
- Evaluation of the practical project: 80%

PRECONDITIONS

None	
DEPARTMENT	Computer Graphics and Multimedia
LECTURERS	Tiago Rodrigues
LITERATURE	<ul style="list-style-type: none"> • Vladimir Geroimenko. Augmented Reality in Education: A New Technology for Teaching and Learning (Springer Series on Cultural Computing). Springer, 2020 • Meltem Yurt. Storytelling with Augmented Reality: A Learning Tool for Children. Nomos Verlagsges.MBH 2019 • K. Sheehy, R. Ferguson, G. Clough. 2014. Augmented Education: Bringing Real and Virtual Learning Together (Digital Education and Learning). Palgrave Macmillan