

# EUROPEAN HERITAGE, DIGITAL MEDIA AND THE INFORMATION

(Università degli Studi)

## Teaching VIRTUAL AND AUGMENTED REALITY APPLICATIONS

GenCod A004196

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**Reference professor for teaching** Lucio Tommaso DE PAOLIS

**Teaching in italian** VIRTUAL AND AUGMENTED REALITY APPLICATIONS

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**SSD code** ING-INF/05

**Reference course** EUROPEAN HERITAGE, DIGITAL MEDIA AND THE

**Course type** Laurea Magistrale

**Credits** 6.0

**Teaching hours** Front activity hours: 42.0

**For enrolled in** 2019/2020

**Taught in** 2019/2020

**Course year** 1

**Language** ENGLISH

**Curriculum** INTERNAZIONALE

**Location**

**Semester** Second Semester

**Exam type** Oral

**Assessment** Final grade

**Course timetable**  
<https://easyroom.unisalento.it/Orario>

### BRIEF COURSE DESCRIPTION

The course presents a review of current Virtual Reality (VR) and Augmented Reality (AR) technologies and provides a detailed analysis of the engineering, scientific and functional aspects of VR systems and the fundamentals of VR modelling and programming. The course also will introduce to the development and building of virtual environments and simulators and presents some force feedback devices and newer visualization and interaction interfaces. Will be acquired knowledge in the main application of VR and AR technologies in medicine and surgery, cultural heritage and games.

### REQUIREMENTS

no requirements

### COURSE AIMS

The learning outcomes will be the acquisition of knowledge in VR and AR technologies in terms of used devices, building of the virtual environment, modalities of interaction and modelling and design of an AR application.

### TEACHING METHODOLOGY

classroom and laboratory lessons

### ASSESSMENT TYPE

The final exam consists in the discussion on the project developed by the student.

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## FULL SYLLABUS

### ***Course description***

#### ***Introduction to Virtual and Augmented Reality technologies***

- Introduction to Virtual Reality technology
- Introduction to Augmented Reality technology
- Visualization devices
- Building of the virtual environment
- Graphics rendering
- Interaction in the virtual environment (with and without force feedback)
- Physical modelling
- Haptic interfaces
- Marker-based and markerless applications of Augmented Reality

#### ***Virtual and Augmented Reality in Cultural Heritage***

- Virtual Reality in Cultural Heritage
- Virtual Reality for edutainment in Cultural Heritage
- Augmented Reality in Cultural Heritage
- Augmented Reality applications on mobile
- Spatial Augmented Reality

#### ***Virtual and Augmented Reality in Education***

- Virtual Reality applications in education
- Augmented Reality applications in education

#### ***Human-Computer Interaction***

- Introduction to human-computer interaction
- Gestural touchless interactions
- Applications

#### ***Practical lectures in laboratory***

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## REFERENCE TEXT BOOKS

MONTAGNA L., Realtà Virtuale e Realtà Aumentata, Hoepli, 2018

MANIELLO D., Realtà aumentata in spazi pubblici. Tecniche base di video mapping, Le Pensur, 2014

SIDDI F., Grafica 3D con Blender, Apogeo, 2009