Augmented Reality

Academic Year: (2025 / 2026) **Review date: 23/05/2025 16:12:00**

Department assigned to the subject: Telematic Engineering Department

Coordinating teacher: IBAÑEZ ESPIGA, MARIA BLANCA

Type: Compulsory ECTS Credits : 3.0

Year : 1 Semester : 2

OBJECTIVES

The objectives of the course are the following:
+ Provide in-depth knowledge about augmented reality (AR) technology and its application in Industry 4.0.
+ Understand how AR can be integrated into connected industrial processes, optimizing decision-making and data analysis.
+ Encourage the ability to design and implement distributed applications based on AR in advanced industrial environments.
+ Utilize data from various sources to improve efficiency, flexibility, and productivity in industrial processes.
+ Develop skills to interact with the physical environment through digital tools that enhance production and industrial management systems.

LEARNING RESULTS
Manage augmented reality technology for the design and implementation of distributed applications in the context of Industry 4.0 by collecting information from different data sources.

DESCRIPTION OF CONTENTS: PROGRAMME

- Basic fundamentals of Augmented Reality. Technology use cases in various fields of application, paying special attention to the Connected Industry 4.0
- Techniques to superimpose digital information on the real environment.
- Techniques to interact with the real and digital environment.
- Data management in augmented reality environments

LEARNING ACTIVITIES AND METHODOLOGY

AF1 Lectures.
AF5 Tutorials.
AF6 Group work.
AF7 Individual work of the student
AF8 Midterm and final exams.

TEACHING METHODOLOGIES
MD1 Teacher's lecture with support of computer and audiovisual media, in which the main concepts of the subject are developed and the bibliography is provided to complement the students' learning.
MD2 Critical reading of texts recommended by the teacher of the subject: articles, reports, manuals and / or academic articles, either for further discussion in class, or to expand and consolidate the knowledge of the subject.
MD3 Resolution of practical cases, problems, etc. raised by the teacher individually or in groups.
MD4 Exhibition and discussion in class of topics related to the content of the subject, as well as case studies.

ASSESSMENT SYSTEM

% end-of-term-examination/test:	40
% of continuous assessment (assigments, laboratory, practicals…):	60

Continuous evaluation (SE2):
-Midterm I: 20%
-Midterm II: 20%
-Final work (in group): 20%

Final exam (SE3): 40%

In the extraordinary assessment, the student's grade will be the result of the option that is most favorable among (1) and (2):

1. The grade obtained in the final exam of the extraordinary call.
2. If the grade of the final exam of the extraordinary call is greater than or equal to 4.0 points, their grade will be:
   (a) 60% of the continuous assessment + 40% of the final exam of the extraordinary call.
   (b) If not, their grade will be the minimum between:
      (*) 4.5 and
      (*) 60% of the continuous assessment + 40% of the final exam of the extraordinary call.

BASIC BIBLIOGRAPHY

- Craig, A. B Understanding augmented reality: Concepts and applications., Newnes, 2013

- Linowes, J., & Babilinski, K. Augmented Reality for Developers: Build Practical Augmented Reality Applications with Unity, ARCore, ARKit, and Vuforia, Packt Publishing Ltd., 2017

ADDITIONAL BIBLIOGRAPHY

- Dieter Schmalstieg, Tobias Höllerer Augmented Reality: Principles and Practice, Addison-Wesley Professional, 2016

- Erin Pangilinan, Steve Lukas, Vasanth Mohan Creating Augmented and Virtual Realities, O'Reilly Media, Inc., 2019