

Academic Year: ( 2017 / 2018 )

Review date: 15-02-2017

Department assigned to the subject: Department of Bioengineering and Aerospace Engineering

Coordinating teacher: GARCIA-HERAS CARRETERO, JAVIER

Type: Compulsory ECTS Credits : 3.0

Year : 1 Semester : 2

#### STUDENTS ARE EXPECTED TO HAVE COMPLETED

Basic knowledge in Computers and Programming Languages.

#### COMPETENCES AND SKILLS THAT WILL BE ACQUIRED AND LEARNING RESULTS.

##### COMPETENCES:

Fundamental and applied knowledge on Onboard Critical Software.

Acquisition of the basic knowledge for the Development of a Onboard Critical Software.

Acquisition of the knowledge of the basic Certification rules and guidelines applicable to an Oboard Critical Software.

##### LEARNING RESULTS:

The students shall be able to understand the complete Development Process of an Onboard Critical Software and to understand the Certification and Safety requirements applicable to such kind of Software.

#### DESCRIPTION OF CONTENTS: PROGRAMME

Elements of Critical Software Introduction.

Introduction to RTCA DO-178B.

Introduction to RTCA DO-178C.

SW Architectures Description.

Low Level Programming.

Real-Time Operating Systems.

SW Requirements Management Practice.

SW Design.

SW Design Practices.

SW Implementation.

SW Implementation Practices.

SW Verification.

SW Verification Practices.

#### LEARNING ACTIVITIES AND METHODOLOGY

Theory sessions.

Practical Exercises during the sessions.

Practices in the Computers Room.

Practices in Laboratory.

In addition, 1 hour/week as Office Hour by the professor.

## ASSESSMENT SYSTEM

End-of-term exam: 25%.

Class Exercises and Practices: 75% (with 50% for Exercises and 50% for Practices).

In order to pass the subject, two requirements need to be met:

1) to have a MINIMUM mark of 4.0/10 in the end-of-term exam;

2) to have a minimum overall mark of 5.0/10 (weighing 25% the end-of-term exam mark and 75% the mark of the continuous evaluation):

¿ % end-of-term-examination: 25

¿ % of continuous assessment (assignments, laboratory, practicals...): 75

**% end-of-term-examination:** 25

**% of continuous assessment (assignments, laboratory, practicals...):** 75

## BASIC BIBLIOGRAPHY

- ARINC Avionics Software Standard Interface. ARINC Specification 653. , ARINC, 2003
- Grady Booch, Ivar Jacobson & Jim Rumbaugh OMG Unified Modeling Language Specification, Version 1.3, OMG, 2008
- RTCA DO-178C, ¿Software Considerations in Airborne Systems and Equipment Certification, RTCA, 2011
- RTCA DO-178B, Software Considerations in Airborne Systems and Equipment Certification, RTCA, 1992
- SAE ARP4754: Certification Considerations for Highly Integrated or Complex Aircraft Systems, SAE, 1996