Elements of critical software

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 (assigments, laboratory, practicals...): 75

% end-of-term-examination:	25
% of continuous assessment (assigments, 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